Striking the Balance: Examining the Trade-Off Between Social and Financial Performance in African Microfinance Institutions

Nihel Halouani

Assistant professor on Accounting at the University of Business and Technology, College of Business Administration (CBA).

Abstract:

We analyze a sample of 94 African Microfinance Institutions (MFIs) using the measures of social performance (SP) and financial performance (FP) provided by the MIX database over 2012- 2022. We test the existence of an optimal level of SP in the microfinance industry beyond which the FP of MFIs starts declining. We apply to a balanced panel dataset the dynamic adjustment model that allows the optimal coefficient of SP to vary across individual MFIs and over time. We find that the optimality of Social Performance (SP) may reduce the long-term Financial Performance (FP), due to the higher costs associated with loans with low amounts granted to poor clients. The SP is positively and significantly correlated with the prior higher sustainability of MFIs, although this relationship may have an optimal level beyond which it can be reversed. FP appears to facilitate socially oriented loans, and SP should then be more accessible to already profitable businesses.

Keywords: Africa, balanced panel dataset, dynamic adjustment models, Financial Performance, microfinance, Social Performance.

JEL: C33, C13, C22, G21, I3

Introduction:

Microfinance is currently divided between two perspectives. The first advocates for integrating the sector into mainstream financial markets, while the second warns that this approach could lead to exclusion from microfinance services. A combination of these two visions might improve both access to financial services for the poor and sustainability in the sector.

Our study examines the divergent findings in the literature regarding the relationship between social performance (SP) and financial performance (FP) in microfinance. While some studies show a positive link, previous research often derived conclusions from heterogeneous industry samples and typically analyzed the relationship at a single point in time, neglecting the temporal aspect.

The aim is to determine if African MFIs can achieve both SP and FP or if they face a trade-off, possibly leading to mission drift. The original goal of microfinance was to serve the unbanked poor, but with commercialization, this target may be diluted. The study hypothesizes that an equilibrium exists between financial and social goals, enabling MFIs to balance both.

Using a sample of 94 African MFIs from 2012-2022, the study employs a dynamic adjustment model to explore the evolving relationship between SP and FP over time. It finds that optimal social performance might reduce long-term financial sustainability due to the higher costs of serving poor clients with small loans. However, SP is positively correlated with prior financial sustainability, suggesting that profitable MFIs are better positioned to achieve social goals without sacrificing financial outcomes.

In conclusion, while financial performance can support socially oriented loans, the optimal level of social performance may vary across MFIs, and beyond a certain point, it may hinder long-term financial viability (Beisland et al., 2022).

The remainder of the paper is organized as follows. Section 2 reviews the related literature and develops our hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical results, and Section 5 concludes.

Literature Review

The literature on the relationship between social performance (SP) and financial performance (FP) in microfinance has produced mixed findings. Some studies suggest a positive correlation, where "doing good" leads to "doing well" (Ghising, 2022), while others indicate a negative relationship, showing a trade-off between the two objectives (Ghising, 2022). This divergence may stem from factors such as heterogeneous samples from various industries and cross-sectional analyses that don't account for temporal dynamics (Copestake, 2007).

Theories like stakeholder theory suggest that socially responsible firms may be rewarded with better financial performance, while the trade-off hypothesis argues that social initiatives may incur costs that hinder financial success (Ghising, 2022). The microfinance sector is divided between the Institutionalist Approach, which promotes integration into formal financial markets for sustainability, and the Welfarist Approach, which critiques commercialization for potentially excluding the poorest (Mersland, 2005).

Our study aims to address the contradictions in the literature regarding the SP-FP relationship in African MFIs, exploring whether these institutions can balance both goals or if a mission drift occurs (Morduch, 2000; Hermes & Hudon, 2018). While microfinance initially aimed to serve the unbanked, commercialization may undermine this mission as poverty

worsens in Africa. The study hypothesizes that there may be an equilibrium point between financial sustainability and the original social mission.

Through a dynamic model, this study examines the adjustment costs of SP using a panel dataset of 94 African MFIs (1034 observations from 2012–2022). Unlike previous studies focusing on concurrent relationships, this research investigates both past and future FP and the interactions between past and future SP. This approach aims to provide deeper insights into the complex SP-FP relationship, which has been underexplored in existing research (Beisland et al., 2020; Hermes & Hudon, 2018).

The paper is organized as follows: The second section provides a brief literature review upon the relationship of SP versus FP with respect to empirical evidence and the controversial issue of linearity. In the third section, we develop our hypothesis based on a theoretical framework. The fourth section presents our sample and our research methodology. The results will be presented and discussed in the fifth section, and finally, we conclude in the last section.

The trade-off between SP and profitability: literature review

The research on microfinance institutions (MFIs) highlights a trade-off between social performance (SP) and financial performance (FP). Studies like Cull et al. (2007) and Hermès et al. (2011) show that as MFIs become more commercialized, their ability to serve the poorest declines. Nonprofit MFIs tend to serve the poorest, while for-profit ones cater to slightly less impoverished clients (Cull et al., 2009; Kaur & Singh, 2020).

Despite this, innovative loan contracts (e.g., group lending, dynamic incentives) have allowed MFIs to maintain high repayment rates, even for the poorest borrowers (Hassan, 2002; Epstein & Yuthas, 2011). Pattnaik (2018) and others also point to the trade-off between high repayment rates and higher operational costs for small loans, which are more costly to manage than larger loans (Remer & Kattilakoski, 2021).

Further, the relationship between SP and FP is complex and non-linear. Many studies show a positive relationship between the two, but recent research suggests a curvilinear or inverted U-shape connection, where beyond a certain point, increasing social performance may negatively impact financial outcomes (Barnett & Salomon, 2006; Brammer & Millington, 2008). This indicates that there may be an optimal level of social performance, after which further improvements could harm financial performance (Lankoski, 2008).

Recent studies explore the need for more advanced models that account for this complexity, suggesting that factors like R&D intensity and other firm-level variables may play a role in how SP and FP interact (Guo et al., 2020; Lin et al., 2008).

This literature emphasizes the need to reconsider simple models of SP-FP relationships, moving towards a more nuanced understanding of how MFIs balance financial sustainability and their social mission.

Hypothesis :

The relationship between social performance (SP) and financial performance (FP) has been a focal point for academic research. Studies suggest that this relationship is complex and influenced by factors such as the study period (Zhang et al., 2020; Erekson et al., 2008; Gönenç & Scholtens, 2019; Benlemlih, 2017). Many authors argue that SP is a progressive and relative concept that evolves over time, making it a "hardly measurable elusive concept" rooted in moral positions (Gönenç & Scholtens, 2019; Benlemlih, 2017). Consequently, the relationship between social performance and financial performance may also change over time as the concept of social responsibility evolves.

Pasquero (2005) argues that the concept of social responsibility is created through a process of sedimentation, where each period adds its own social responsibility requirements to the previous ones. This suggests that the

relationship between social performance and financial performance may vary depending on the specific time period being studied. Moreover, recent research has highlighted the importance of considering systemic and industry-specific factors when examining this relationship, as the dynamics may differ across industries and economic environments. (Gönenç & Scholtens, 2019)

The present study aims to investigate the hypothesis that the relationship between social performance and financial performance is dependent on the study period. We can consequently expect that the relationship between SP and FP change over time. Some works suggest that the choice of the study period affects the conclusions. (Tremblay and Rolland, 2004; Tebini and M'Zali, 2010).

H.1. The relationship between social performance and financial performance depends on the study period.

The microfinance sector is a diverse landscape, encompassing institutions of varying size, legal status, age, and mission (Hermes & Hudon, 2018). While the promoters of microfinance often tout the "double bottom line" of achieving both financial and social objectives, it remains unclear whether this applies to all types of microfinance institutions or if only the largest or less risky institutions are able to realize these dual goals. (Beisland et al., 2020). Identifying the specific factors within microfinance institutions that influence the relationship

between social performance and financial performance is essential (Naseer & Azam, 2019; Hermes & Hudon, 2018).

Previous studies have explored the determinants of microfinance institution performance, with a focus on MFI characteristics, funding sources, organizational governance, and external contextual factors (Hermes & Hudon, 2018). However, the evidence on these issues remains mixed, and the direction of the relationship between these drivers and MFI performance often depends on the specific country context. (Hermes & Hudon, 2018)

Additionally, there is a lack of consensus in the literature on the measurement of financial and social performance, with scholars arguing for a multidimensional approach to assessing social performance. (Hermes & Hudon, 2018)

We have defined our main research hypothesis as follows:

H.2. The relationship between social performance and financial performance depends on microfinance institution-specific factors.

The factors that could influence the relationship between social performance and financial performance in microfinance institutions are numerous. Previous qualitative studies and an extensive review of the literature have identified several key factors that are of concern to practitioners and researchers in this context. These factors include the size, age, legal status, credit methodology, and risk profile of microfinance institutions (Hermes & Hudon, 2018; King'ori et al., 2017; Naseer & Azam, 2019).

This brings us to formulate the following three sub-hypotheses:

Table 1. Sub-hypothesis of MFIs specific factors

Factors	Theoretical framework	Hypothesis
Size of the institution	MFIs having a larger size have a greater visibility among international actors, better access to resources, and can more easily achieve economies of scale if reputational risk is the main element of motivation for realizing their double bottom line. (Araya and Christen , 2004; Coulson and Dixon , 1995; Wenner , 2002; ; Cull and al., 2007 and Mersland and Strøm, 2009)	H.2.1: Large MFIs tend to have a positive link between SP and FP.
Age of the institution (i)	In the microfinance industry, it seems that SP and FP tend to increase with the number of years of existence of the MFI. This progress can be explained by the fact that in their creation, institutions rely on a small but motivated team, and a flexible operating mode. Thereafter, when they reach a stage of maturity, companies tend to be more proactive in terms of financial objectives. (Jawahar and McLaughlin, 2001; Cull, Demirguc-Kunt and Morduch; 2006; Elsayed and Paton, 2007). Bédécarrats and al (2011) recognize that SP increases with the age of MFIs due to an increased formalization of procedures in mature MFIs.	H.2.2: Mature MFIs tend to have a positive link between SP and FP.
Legal status (ii)	MFIs are hybrid organizations that blend banking logic (profitability, clients as customers) with development logic (poverty alleviation, clients as beneficiaries) (Battilana & Dorado, 2010; Kent & Dacin, 2013). They face the challenge of balancing two often conflicting objectives: financial self-sufficiency and poverty reduction (Hermes et al., 2011). Research by Lensink and Mersland (2009) shows that NGOs typically offer non-financial services (training, coaching, awareness) alongside financial products. Thus, NGOs are likely to adopt strategies that foster a positive link between SP and FP. In contrast, for-profit or commercial MFIs face greater financial pressures, with high costs and technical complexities acting as significant barriers to their commitment to poverty reduction (White & Campion, 2002; Jansson et al., 2004; Fernando, 2004; Ledgerwood & White, 2006; Karlan & Valdivia, 2006).	H.2.3: Transformation of MFIs from the subsidized approach to the commercial approach tend to have a negative impact on the link between SP and FP.
Methodology of credit	Mersland and Strøm, (2009) find that the outreach is lower in MFIs using individual loans instead of group loans. Cull and al. (2007) provide that the MFI improves their FP, to a determinant level, with individual loans. Armendariz de Aghion and Morduch (2005); Ahlin and Townsend (2007) and Casar and al., (2007) emphasize that group lending may increase the reimbursement rates, because they lead to a solidarity in repayment. However, Cull and al. (2007) find that individual lenders have better FP, while group lenders show a greater scope for the poorest clients.	H 2-4: The use of individual loans by MFIs have a negative impact on the link between SP and FP.
Portfolio at risk 30 days	Chakravarty and Pylypiv, (2014) find that an increase in the ratio of private donor funding to public subsidization lowers the portfolio-at-risk (PAR30) of MFI institutions as well as their overall loan risk. They confirm that greater levels of donor-to-subsidy funding has a negative relationship with MFI loan risk. Moreover, Hudon and Traca (2011) observe a negative marginal effect on MFI efficiency after the amount of donation crosses above a threshold level. They note that the lack of reliable information coupled with insufficient disclosure in the sector may accentuate the information asymmetry problem, and therefore decline the amount of subsidies.	H 2-5 Portfolio at Risk have a negative effect on the relationship between SP and FP.

(i) The MIX considers an MFI as "mature" when it has more than 8 years, "young" if it has between 5 and 8 years and "emerging" if it has less than 5 years. (Adair and Berguiga, 2010)

(ii) There are four statutes commonly used to classify MFIs (banks, non financial Institutions, Cooperatives and non-governmental organizations). In our study, we use two statues, in particular, those that may be better associated with our problematic: banks and non-governmental organizations (NGOs). More precisely, we classify two main categories of MFIs, the for-profit MFIs or commercial MFIs, and the non-profit MFIs called the Non Governmental Organizations (NGOs).

Orlitzky et al. (2003) and Margolis and Walsh (2003) concluded that SP and FP are positively related, with Waddock and Graves (1997) suggesting a linear relationship between the two. They show that the relationship between SP and FP is linear.

H.3. The relationship between SP and FP depends on the choice of a linear model.

However, recent research challenges this simplicity. Rossi et al. (2023), provided evidence of a curvilinear relationship, indicating that the SP-FP link may be more complex than previously thought. Similarly, Jain et al. (2021), argued that the linear assumption oversimplifies this relationship and emphasized the importance of considering contextual factors such as industry and firm characteristics.

Bédécarrats et al. (2019) confirmed that the relationship between social and financial performance may not always be linear. Their findings indicate that the marginal impact on FP can decrease and

even shift from positive to negative (or vice versa) depending on the level of social performance already achieved. This relationship is described as an inverted U-shaped function, supported by a positive and significant coefficient for the linear term and a negative and significant coefficient for the quadratic term. Similarly, Lankoski (2008), proposed an inverted U-shaped relationship between CSR outcomes and economic performance, suggesting that rising marginal costs of increased CSR activities may outweigh declining marginal revenues. This perspective aligns with the work of Barnett and Salomon (2006) and Elsayed and Paton (2009), who also highlighted the diminishing returns of CSR efforts.

H.4. **The relationship between SP and FP is non-linear: parabolic (U-shaped, inverted curvilinear), or cubic.**

Research methodology and sample

Sample and data

We use a publicly available dataset from the Microfinance Information Exchange market (www.mix.org)[1]. In the beginning, we include 94 MFIs, over the period 2012-2022: (N=1067 observations). After eliminating outliers and MFIs that have disappeared during the study period, we have a balanced panel dataset of 1034 observations. Our sample is finally composed of

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[1] The MIX dataset collects self-reported balance sheet information and is widely used in the literature (Cull et al., 2009; Ahlin et al., 2011; Hermes et al., 2011; Roberts, 2012).

94 MFIs including 36 NGOs and 58 for profit MFIs (Cooperatives, non- financial institutions and banks). The MFIs selected for our sample are those with levels 4 and 5 diamonds. (Tchakoute, 2010).

We focus on African MFIs due to their significantly lower efficiency compared to other regions (Awaworyi Churchill et al., 2018; Chikalipah, 2019; Matotay et al., 2021). This inefficiency stems from factors like limited infrastructure, political instability, and weak regulations (Kinde & Asfaw, 2020), as well as high operating costs and low loan repayment rates (Njanike et al., 2009).

Methodological approach:

Our approach differs from the literature because we start from the premise that different institutions have different revealed preferences regarding whether to maximize social or financial performance.

The approach adopted within the context of our study is based on three stages.

At first, we change the study periods to test the validity of the evolutionary concept of SP through time. We can consequently expect that the relationship between SP and FP can change over time, and then we test **hypothesis 1.**

Subsequently, we introduce the MFI specific factors to test their impact on the relationship between the SP and FP, and verify **hypothesis 2**.

We extend the Waddock and Graves (1997) model to test the linearity of the SP and FP relationship (**Hypothesis 3**). If this hypothesis is rejected, we relax the linearity assumption and estimate the relationship using a nonlinear approach. By modeling two nonlinear equations, we demonstrate the existence of a parabolic or cubic relationship, thereby validating **hypothesis 4**. This approach aligns with García-Fernández et al. (2023), who found evidence of a nonlinear relationship between corporate social responsibility and FP. Similarly, Guney and Schilke; (2010) and Shin et al. (2020), suggested that a curvilinear model, incorporating contextual factors, better explains the SP-FP relationship.

Variables:

- Social Performance

We measure donated equity as a percentage of total assets. Previous studies have measured donated equity as the ratio of donated equity (grants) to subsidy intensity, typically calculated as donated equity divided by total equity (Hudon & Traca, 2011; Bogan, 2012; Serrano-Cinca & Gutiérrez-Nieto, 2013; Tchakoute, 2014). However, as the capital structure of some MFIs, like banks, includes deposits, normalizing donated equity by total equity may underestimate the level of subsidies received

by non-commercial MFIs that cannot collect deposits, unlike their commercial counterparts. Standardizing subsidies by total assets allows for a more accurate comparison between commercial and non-commercial MFIs, regardless of their financial structure (CGAP, 2003, 2010; Hudon & Traca, 2011). Rathore and Lott (2020) also argued that using donated equity to total assets is a better measure of subsidy intensity as it captures the true extent of subsidization. Similarly, Ashraf et al. (2022) emphasized that normalizing donated equity by total assets provides a more comprehensive understanding of the capital structure and subsidization of MFIs.

- Financial Performance

Two measures of FP that are generally considered to capture major dimensions of FP in the microfinance industry were utilized, we use (ROA) and (OSS). These measures are commonly used in the microfinance industry to capture major dimensions of FP. (Bruett, 2005 ; Lafourcade and al., 2006 ; Hartarska, 2005, 2008 ; Mersland and Strøm, 2009, 2008 ; Cull and al., 2007 ; 2009a, Tchakoute, 2010; Kinde and Asfaw, 2021; Njanike et al., 2019; Rathore and Lott, 2021; Ashraf et al., 2020). Data on ROA and OSS were derived from the Mixmarket database.

- Control Variables

Previous research on the relationship between social performance (SP) and financial performance (FP) has yielded mixed results. Some studies report a positive relationship, while others find inconsistent or even negative outcomes (García-Castro et al., 2009; Ciciretti et al., 2014). Key control variables, such as firm size, age, risk, and industry, play a crucial role in understanding this relationship, adding robustness to the analysis (Bukit et al., 2018; Ciciretti et al., 2014).

Scholars like Mahoney and Roberts (2007), Ullman (1985), and Waddock and Graves (1997) emphasize the importance of including these variables when studying SP-FP interactions. For instance, Nelling and Webb (2009) found that SP is more influenced by firm-specific factors than by FP itself. Moreover, Waddock and Graves (1997) suggest that smaller firms may exhibit greater social responsibility compared to larger firms, while McGuire et al. (2011) argue that firm size and systematic risk are significant determinants of both SP and FP. Fama and French (1992) found that less risky firms might invest conservatively, resulting in lower profitability, whereas riskier firms may struggle to manage social responsibility effectively (Ciciretti et al., 2014).

Recent studies further support these findings. Cho et al. (2020) demonstrated a positive relationship between CSR and FP, while Sang Jun Cho et al. (2019) proposed that SP and FP

could be **co-**determined, with SP exerting a stronger influence on FP (Ciciretti et al., 2014**).**

Table 2. Reports median values, classified by the legal status of the institutions

Variables(i)	Definition	NGOs	For profit MFIs
	Social Performance		
Donated equity (ii)	**Donated equity/total assets**	**0.19**	**0.041**
	Financial Performance		
Return on assets	**(Net operating income-taxes)/Average total assets: measures a MFIs' capacity to use its assets to generate returns.**	**1.34**	**1.92**
Operational Self Sufficiency	**Financial revenue/ (Financial expense + Net impairment loss + operating expense)**	**106.22**	**110.505**
	MFI-specific factors		
Size	**Logarithm of total assets of the MFI.**	**8.44**	**8.979**
Age	**Number of years since the creation of the MFI.**	**10**	**10**
Status	**Dummy variable: 1 if the MFI is an NGO, 0 otherwise.**	**1**	**0**
Methodology of credit	**The MFI does some solidarity style lending (as opposed to MFI which do only individual lending): Dummy variable: 1 if the MFI adopt individual contracts, 0 otherwise.**	**1**	**1**
PAR 30(iii)	**Outstanding Balance on arrears over 30 days + Total Gross Outstanding Refinanced (restructured) Portfolio) / Total Gross Portfolio Measurement of portfolio quality.**	**2.47**	**5.315**

(i)These indicators are proposed by the Mixmarket database.

(ii) Calculated from the balance sheet of the Mixmarket database

(iii) It shows the part of the portfolio affected by outstanding payments, where there is a risk that they will not be repaid.

Empirical framework
Non linearity of relationship SP-FP

We examine the relationship between FP and SP in the context of the African microfinance industry (Waddock & Graves, 1997; Hillman & Keim, 2001; Guarneri & Spaggiari, 2010; Rhyne & Lieberman, 2010; Guney & Schilke, 2010; Nelling & Webb, 2009; Bédécarrats et al., 2011). The model proposed by Waddock and Graves serves as the foundation for this analysis. Barth et al. (2013) investigated the financial and social performance of MFIs in Sub-Saharan Africa and found a positive relationship between social and financial outcomes. Similarly, Seibel and Gumboh (2016) analyzed the role of microfinance in poverty reduction and social welfare in Uganda, further highlighting the interdependence of FP and SP in the African microfinance sector.

The model proposed by Waddock and Graves (1997) has the following general form:

$$FP_{i,t} = \alpha + \beta_1 SP_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 AGE_{i,t-1} + \beta_4 LegSt_{i,t-1} + \beta_5 INDIV_{i,t-1} + \beta_6 PAR_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

Where:

SP_{it} = The measure of SP calculated using mixmarket data of MFI i at time t: donated equity of MFI i at time t.

SP_{it-1} = The measure of SP calculated using mixmarket data of MFI i at time t-1: donated equity of MFI i at time t-1.

FP$_{it}$= The measure of SP calculated using mixmarket data of MFI i at time t: ROA and OSS of MFI i at time t.

FP $_{it-1}$ = The measure of SP calculated using mixmarket data of MFI i at time t-1: ROA and OSS of MFI i at time t-1.

SIZE$_{it-1}$= The natural logarithm of either total assets of MFI i at time t-1.

INDIV$_{it-1}$= Dummy variable of MFI i at time t-1: 1 if the MFI adopt individual contracts, 0 otherwise.

AGE$_{it-1}$= Number of years since the creation of the MFI i at time t-1.

PAR 30$_{it-1}$= (Outstanding Balance on arrears over 30 days + Total Gross Outstanding Refinanced (restructured) Portfolio) / Total Gross Portfolio Measurement of portfolio quality) of the MFI i at time t-1.

In our empirical study, we resort to the estimation via dynamic panel data to search for equilibrium in the dual mission of microfinance. This approach helps to explore the long-term relationship between SP and FP. According to Munoz (2005), a dynamic model provides both short- and long-term elasticities. We apply Elsayed and Paton's (2004) method, using the generalized method of moments (GMM) based on the Arellano and Bond procedure (Arellano & Bond, 1991, 1995; Blundell & Bond, 1998). The GMM technique addresses the endogeneity problem by estimating the model in both levels and first differences. Our study explores the relationship between past and future FP, as well as prior and subsequent SP, which differs from

previous studies that typically analyze the concurrent relationship between SP and FP. By interchanging SP and FP as dependent and explanatory variables, we examine the causality between the two, suggesting that causation tends to flow from FP to SP. (Scholtens, 2008). We also propose a reverse U-shaped relationship, where FP improves with higher SP up to a point, after which it deteriorates due to diminishing returns from excessive social responsibility. This is consistent with Barnett and Salomon (2006) and Brammer and Millington (2008), who argue that firms may fail to save resources for alternative investments or differentiate themselves with overly responsible behavior, leading to a U-shaped relationship. Additionally, the competitive advantage argument suggests that firms following either differentiation or low-cost strategies perform better, indicating a cubic relationship between SP and FP, where firms with moderate SP tend to perform worse than those with higher or lower SP. (Porter's, 1980).

To consider the non-linearity between SP and the FP, we include in equation 2 the squared (FP^2) and cubed terms (FP^3) of FP; and in equation 3 the squared (SP^2) and cubed terms (SP^3) of SP.

To test the non-linear relationship, two nonlinear models are proposed:

$$\mathbf{SP_{i,t}} = \alpha + \beta_1 FP_{i,t-1} + \beta_1 FP_{i,t-1}^2 + \beta_1 FP_{i,t-1}^3 + \beta_2 SIZE_{i,t-1} + \beta_3 AGE_{i,t-1} + \beta_4 LegSt_{i,t-1} + \beta_5 INDIV_{i,t-1} + \beta_6 PAR_{i,t-1} + \varepsilon_{i,t}$$
$$(2)$$

$$FP_{i,t} = \alpha + \beta_1 SP_{i,t-1} + \beta_1 SP_{i,t-1}^2 + \beta_1 SP_{i,t-1}^3 + \beta_2 SIZE_{i,t-1} + \beta_3 AGE_{i,t-1} + \beta_4 LegSt_{i,t-1} + \beta_5 INDIV_{i,t-1} + \beta_6 PAR_{i,t-1} + \varepsilon_{i,t}$$
(3)

Cross-sectional analysis[2]

Table 3 presents the results of a model where social performance (SP), measured as donated equity, is the dependent variable, and financial performance (FP) is assessed in two ways. All variables are measured at time t. We find a non-linear relationship (cubic and parabolic) between SP and FP in 10 out of 22 cases, supporting an inverted-U shape between SP and FP, as proposed by Lankoski (2000, 2008), Barnett and Salomon (2006), Brammer and Millington (2008), and Elsayed and Paton (2013). Specifically, the relationship is positive at low levels of FP, but turns negative beyond an optimal FP level, confirming hypotheses 4 and 5.

These findings align with those of Maletič et al. (2019) and Goll and Rasheed (2004), who also found an inverted-U relationship between CSR and FP, indicating an optimal level of CSR beyond which FP declines. A U-shaped relationship is observed with the sustainability FP measure, confirming hypothesis 4. Additionally, the cubic relationship for ROA (2014)

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[2] The cross-sectional estimations in each of eleven years are based on a model in which the dependent and all explanatory variables are measured at time [t].

and OSS (2022) suggests SP increases at both low and high FP levels but decreases at medium levels, supporting hypothesis 4.

In a linear setting, most cases show no significant relationship between SP and FP, except for ROA, which shows a statistically significant linear relationship at the 10% level, aligning with hypothesis 3. The variations in SP-FP relationships across time confirm that SP is a progressive concept, with fluctuations supporting studies (e.g., Tremblay & Rolland, 2004; Tebini & M'Zali, 2010) that argue the study period affects the relationship, validating the non-monotonic relationship between SP and FP as hypothesized.

Recent studies like Hou et al. (2020) and Shahzad et al. (2021) also support these findings, with U-shaped and cubic relationships between CSR and FP in Chinese and Pakistani firms, respectively.

Regarding control variables, firm size (log of total assets) is positively related to SP (hypothesis 2-1). The age of MFIs (AGE) negatively affects SP during the first four years but becomes positive thereafter, partially confirming hypothesis 2-2. The form of the institution (NGO) is positively related to SP (hypothesis 2-3). Individual loan methods (INDIV) are negatively correlated with SP, as they place repayment responsibility solely on individual borrowers, while group loans share the responsibility, supporting hypothesis 2-4. Finally, risky

firms show a negative relationship with SP, as indicated by the PaR30 coefficient, confirming hypothesis 2-5.

Table 3. Determinants of social performance (cross-sectional analysis)

ROA	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
FP	-0.006*	-0.0006*	-0.007**	0.0052	-0.004*	-0.008*	-0.010	-0.005	0.0004	-0.010*	0.007
FP^2	-0.0019*	-0.0023**	-0.0001**	-	-	0.0008*	-	-	-	-0.0071*	-
FP^3	-	-	0.00001**	-	-	-	-	-	-	-	-
Size	1.973***	1.97***	1.974***	1.99***	1.98***	1.97***	1.97***	1.96***	1.96***	1.96***	1.96
Age	0.025***	0.025***	0.023***	0.023***	0.27***	0.29***	0.3***	0.032***	0.028***	.028***	0.26***
LegSt	65.5***	65.56***	65.56***	65.5***	65.5***	65.5***	65.55***	65.53***	65.5***	65.5***	65.58***
INDIV	-14.85***	-14.88***	-14.87***	-14.85***	-14.83***	-14.84***	-14.84***	-14.88***	-14.87***	-14.88***	-14.91***
PAR30	-0.010***	-0.014***	-0.0159***	-0.018***	-0.013***	-0.015***	-0.012***	-0.014***	-0.013***	-0.01***	-0.006***
F-Statistic	4.22**	4.53**	2.74**	4.48**	4.23**	4.22**	3.92**	5.51**	3.49**	3.39**	3.87**
Adj.R^2	0.31	0.233	0.13	0.23	0.0003	0.0003	0.0006	0.0001	0.0016	0.002	0.0006
OSS	2012	2003	2004	2005	2006	2007	2008	2009	2010	2011	2022
FP	0.0007	-0.0082*	-0.0063*	-0.0167*	-0.0027	-0.0178*	-0.012*	-0.321	-0.0087	-0.010*	-0.0195***
FP^2	-	-0.00008*	-	0.0001*	-	-	-0.009*	-	-	-0.00005*	-0.00016***
FP^3	-	-	-	-	-	-	-	-	-	-	0.0004***
Size	1.97***	1.966***	1.87***	1.98***	1.97***	1.97***	1.96***	-0.028***	1.96***	1.96***	1.95***
Age	-0.023***	-0.024***	-0.027***	-0.024***	0.29***	0.028***	0.31***	0.83***	0.028***	0.28***	0.25***
LegSt	65.5***	65.53***	65.23***	65.5***	65.5***	65.53**	65.53***	18.62***	65.54***	65.54***	65.6***
INDIV	-14.85***	-14.85***	-15.47***	-14.86***	-14.84***	-14.84***	-14.84***	-4.47***	-14.8***	-14.87***	-14.94***
PAR30	-0.01***	-0.014***	-0.015***	-0.020***	-0.014***	-0.016***	-0.013***	-0.089***	-0.013***	-0.013***	-0.005
F-Statistic	3.76**	3.83**	3.18***	4.56**	4.33**	4.78**	4.07**	5.51**	3.78**	3.69**	4.52**
Adj.R^2	0.20	0.195	0.158	0.23	0.0002	0.0001	0.0004	0.0001	0.0008	0.001	0.0001

Our models are estimated by the panel estimator.

*, **, *** Significant respectively at 10%, 5% and 1%.

The coefficient is indicated by the figures above. The probability is in parenthesis.

SP: donated equity: Donated equity/total assets; FP: [ROA: Net operating income / total assets; OSS: Financial Revenue / (Financial expense + operating expenses + provision for doubtful debts)]; LegSt: Legal Form (NGOs vs For profit MFIs); INDIV: Methodology of loan (individual loan vs group loan); Size: Size of the MFI (logarithm of total assets); Age: Age of the MFI; PAR30: Outstanding Balance on arrears over 30 days + Total Gross Outstanding Refinanced (restructured) Portfolio) / Total Gross Portfolio Measurement of portfolio quality.

Lagged Cross-sectional analysis

Table 4 presents the determinant of financial and social performance with lagged cross-sectional estimates designed with econometric panel data models. It identifies the cumulative effect of FP on SP in model A; and vice-versa in model B. this estimation allows us to check the "reproducibility" of results

Table 4. Lagged cross-sectional estimates (1) for social performance and financial performance

	Model A: Dependent variable is SP			Model B: Dependent variable is FP	
	ROA_t	OSS_t		ROA_t	OSS_t
$levFP_{t-1}$	-.3323 (0.329)	3.858*** (3.858)	$levSP_{t-1}$	-.0238* (0.05)	.774 (0.107)
$levFP^2_{t-1}$	-	-.0633*** (0.013)	$levSP^2_{t-1}$	-	-
$levFP^3_{t-1}$	-	.00030*** (0.042)	$levSP^3_{t-1}$	-	-
$levSize_{t-1}$	.8111*** (0.002)	5.9552*** (0.015)	$levSize_{t-1}$	3.871*** (0.000)	.9273 (0.583)
$levAge_{t-1}$	.0760 (0.702)	.4982 (0.487)	$levAge_{t-1}$	.5804 (0.186)	.7089 (0.110)
$levLegSt_{t-1}$	.0896 (0.46)	6.900 (0.435)	$levLegSt_{t-1}$	14.27*** (0.01)	16.057*** (0.003)
$levINDIV_{t-1}$	.8175 (0.773)	-11.59 (0.259)	$levINDIV_{t-1}$	11.06 (0.069)	7.0142 (0.266)
$levPAR30_{t-1}$	-.0958* (0.05)	-.3488 (0584)	$levPAR30_{t-1}$	.4516 (0.273)	.297 (0.461)
F-Statistic	3.88***	7.89***	F-Statistic	4.75***	5.79***
Adj.R^2	0.874	0.921	Adj.R^2	0.813	0.837

The dependent variable (either SP or FP) is measured in 2022. The explanatory variables are based on the lagged values, averaged for the 2022-2021 period. The constant term is not reported. Robust standard errors are in the parentheses.

(1) Cross-lagged panel correlations (CLPC) is a technique developed some time ago by Campbell (1963) to assess the relative importance of the variables X and y in a causal analysis by comparing the lagged zero-order correlations. Though subjected to withering criticism (Duncan, 1969a, 1972; Heise, 1970; Rogosa, 1979, 1980), the technique has been widely used in psychology and occasionally in sociology (a score of applications are cited in Sims and Wilkerson, 1977 and Rogosa, 1980; and the bibliographies in these sources are by no means complete). More recently, the technique has been proposed as a test for spuriousness. (Kessler and Greenberg,1981)

In Model A, where FP is the dependent variable at time t and explanatory variables are measured as the average of the lagged

period (from 2022 to 2021), we find that when the dependent variable is ROA, higher past SP leads to lower FP, though the effect is not statistically significant. However, when the dependent variable is OSS, the relationship between FP and SP is cubic, confirming hypothesis 4, as supported by Porter (1980) and Barnett and Salomon (2006). The control variables indicate that firm size and the legal status of the MFI (legst) are significantly and positively related to FP, while PaR30 is negatively correlated with ROA, confirming hypotheses 2-5 and 2-1.

In Model B, changes in prior FP (measured by OSS) do not significantly affect SP. However, higher prior ROA significantly decreases SP, confirming hypothesis 4. As in Table 3, an inverted-U relationship is observed between SP and FP, supporting the consistency of results regarding the SP-FP relationship.

These findings are consistent with recent studies such as Hou et al. (2020), which found a U-shaped relationship between CSR and FP in Chinese companies, suggesting an optimal CSR level. Similarly, Shahzad et al. (2021) identified a cubic relationship between CSR and FP in Pakistani firms, aligning with our results.

Estimation Results of Dynamic Effects (system GMM)

This section explores the dynamic relationship between SP and FP of MFIs using econometric panel data models. Table 5 presents the dynamic panel data estimates, investigating the

lagged effects of SP and FP. The results show a non-linear (cubic) relationship between prior SP and FP in two cases, supporting findings in Table 3. Specifically, at low and high levels of FP, SP increases, while at medium levels of FP, SP decreases. This suggests that investing in social activities might negatively impact FP in the short term but contribute positively to sustainability and profitability in the long term, implying an indirect positive link between SP and FP (Russo & Fouts, 1997; Spicer, 1978; Hudon & Périlleux, 2014; Tchakoute-Tchuigoua & Nekhili, 2016).

No significant link was found between SP and prior FP (measured by ROA), in line with Surroca et al. (2010). However, a significant positive relationship was observed between SP and prior FP (measured by OSS), indicating that MFIs with better FP tend to attract more grants and subsidies (Tchakoute, 2014; Banerjee et al., 2023; Kar et al., 2022). The coefficient on lagged SP is consistently between 0 and 1, with significance at 1% across different FP measures, suggesting that MFIs adjust their SP levels slowly due to varying costs and benefits involved in this process.

The speed of adjustment, based on ROA and OSS, is low, with α values ranging from 0.05 to 0.06, indicating slow rebalancing when an MFI deviates from its optimal SP, likely due to high adjustment costs.

Control variables show that the size of MFIs negatively affects donated equity, with no strong evidence that larger MFIs substitute external debt for equity. FP is significantly positively related to MFI size and age, consistent with findings from Cull et al. (2007), Vanroose & D'Espallier (2009), and others. A negative correlation between Par30 and both ROA and OSS was found, although the coefficients were small (-0.14 for ROA and -0.20 for OSS). There is a strong positive correlation (0.65 for ROA) between SP and the statute measure (LegSt), indicating that MFIs with non-commercialized activities (e.g., NGOs) benefit more from donations, which may also increase efficiency and loan repayment rates (Callen, Klein, & Tinkelman, 2003; Balasubramanian & Mao, 2023; Sanchez & Garcia, 2022).

Finally, the system-GMM method, which accounts for unobservable firm heterogeneity and endogeneity, does not detect any significant link between SP and FP (AR(2) non-significant for all models).

Table 5. Determinants of SP and its dynamics (System-GMM) for the whole period;

Determinants of SP and its dynamics (**System-GMM**) for the whole period;

	FP_t		SP_t	
	ROA	OSS	ROA	OSS
SP_{t-1}	-.368*** (0.014)	-1.759*** (0.05)	.9408*** (0.000)	.9422*** (0.000)
SP^2_{t-1}	-.0075*** (0.03)	-.0291*** (0.03)		
SP^3_{t-1}	.00003*** (0.023)	.00011*** (0.025)		
FP_{t-1}			.0193 (0.662)	.0334*** (0.026)
FP^2_{t-1}			-	-
FP^3_{t-1}			-	-
$Size_{t-1}$	.5412*** (0.02)	2.659*** (0.008)	-.4164 (0.757)	-.7488 (0.179)
Age_{t-1}	.0981*** (0.008)	.5237*** (0.000)	-.645 (0.631)	.01511 (0.519)
$LegSt_{t-1}$	-.9140 (0.237)	.5634 (0.813)	65.07*** (0.000)	.4914 (0.830)
$INDIV_{t-1}$	.1311 (0.84)	-3.786 (0.171)	5.191 (0.745)	.1386 (0.196)
$PAR30_{t-1}$	-.1421*** (0.007)	-.2063*** (0.006)	-.1065 (0.53)	-.0044 (0.159)
F (Wald)	168.81)	360.64	369.31	614.99
Adjusted R^2	0.3698	0.2688	0.2081	0.6445
AR(1)	-2.4306***	-2.513***	-3.5905 **	-1.7588*
AR(2)	0.40166	0.61730	-0.5935	-0.0910
Sargan Test[3]	89.780	142.226	389.134	136.286

(i) Figures in parentheses are standard errors robust to heteroscedasticity,

(ii) [4]AR(1)and AR(2) are tests for first and second order autocorrelation in the differenced residual;

(iii) Sargan test is the test for the validity of overidentifying restriction,

(iv) * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$,

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[3] Confirms the validity of the instrument set we employed, highlighting the importance of considering the endogeneity issue.

[4] To obtain a reliable and consistent results with the system-GMM we should test the presence of first-order autocorrelation [AR(1)] and absence of second-order autocorrelation [AR(2)]. In order to control for any potential endogeneity problem. These findings also apply to the statistics in Table 3.

(v) Number of observations
is 1034.
(vi) Method of estimation: Arellano–Bond linear dynamic panel-data estimation; See Arellano and Bond (1991).

Discussion of results:

Our study finds that concurrent SP and FP are not directly linked cross-sectionally, supporting Hypothesis 1. The relationship between SP and FP is non-monotonous over time. Specifically, prior SP is negatively related to subsequent FP when FP is measured by ROA, while prior FP has a cubic, non-linear relationship with subsequent SP when FP is measured by OSS. These findings partially support a virtuous cycle, where SP both predicts and is a consequence of FP, aligning with previous studies (Orlitzky, 1998; Galema et al., 2011). Furthermore, MFIs with stronger SP are more likely to attract funding from socially conscious investors (Holzhacker et al., 2016).

The study also agrees with McGuire et al. (1988), who found that prior FP is more closely related to SP than subsequent FP. Donated equity is positively and significantly correlated with the prior sustainability of MFIs, but this relationship may reverse beyond an optimal level. MFIs operating in better institutional environments may access external funding more easily, improving their funding policies (Antoniou et al., 2008; Booth et al., 2001; Demirgüç-Kunt & Maksimovic, 1999). This supports the view that MFIs with better FP indicators attract more grants and subsidies

(Tchakoute, 2014), and their social and environmental performance also affects access to external funding (Serrano-Cinca & Gutiérrez-Nieto, 2014; Ramadhani et al., 2023).

Moreover, the study finds that prior SP has a significantly negative effect on FP, implying that social investments might negatively impact FP in the short term but help achieve long-term sustainability and profitability, creating an indirect positive link between SP and FP (Russo & Fouts, 1997; Spicer, 1978; Nguyen et al., 2023; Huynh et al., 2024).

For control variables, the study finds that the legal status of MFIs has a positive and significant effect on FP, suggesting that more donor funding leads to increased supervision and higher efficiency in nonprofit institutions, which could improve loan repayment rates (Callen et al., 2003; Elmer, 2023; Nguyen, 2024). Additionally, donation to subsidy ratio significantly negatively affects MFI risk (Par30), confirming that greater donor funding reduces loan risk (Hudon & Traca, 2011; Chakravarty & Pylypiv, 2014; Bos & Millone, 2023; Zeng & Wang, 2024). This further supports that MFIs' access to funding is positively influenced by their social and environmental performance (Klock & Stadler, 2023; Jia & Wu, 2024).

Finally, MFI size is positively and significantly correlated with both FP and SP, supporting Hypothesis H2.1 and findings by Cull et al. (2007), Vanroose & D'Espallier (2009), and

Hermes et al. (2009). Additionally, MFI age is positively related to both FP and SP, suggesting that older MFIs tend to improve in both areas, likely due to their ability to innovate and become more competitive (Groeneveld & De Clerck, 2023; Nawaz et al., 2024), confirming Hypothesis H2.2.

Conclusion:

The main goal of our study is to investigate the long-term and short-term association of SP with FP among African MFIs over the period 2012 to 2022, determining (a) whether any linear relationship exists, and (b) the causality of any such relationship by considering the endogeneity problem. We also analyze whether any non-monotonous relation exists between SP and FP. In addition, we explored the possibility that MFIs would have optimal or target SP levels. We test our hypothesis using a study over a sample of 94 MFIs with data drawn between 2012 and 2022.

The results of our study indicate that the relationship between social performance and financial performance among African microfinance institutions over the period 2012 to 2022 is non-monotonous and depends on various factors. We find that prior FP is more closely related to SP than subsequent FP.

Donated equity is positively and significantly correlated with prior higher sustainability of MFIs, but this relation may have an optimal level beyond which it can be reversed. MFIs operating in better institutional conditions may benefit from easier access to external funding to overcome information asymmetries in credit markets, which can affect their funding policies. However, loan risk has a negative and significant effect on donated equity. The size of MFIs has a non-significant negative effect on donated equity, and there is no strong evidence that the largest MFIs substitute external debt for equity.

Our findings suggest the existence of an optimal level of donated equity that allows MFIs to be socially responsible and financially successful simultaneously. MFIs could increase their outreach to motivate donations while reducing the costs of outreach. However, the lack of reliable information and insufficient disclosure in the microfinance industry drives an information asymmetry problem that prevents the distribution of subsidies to the poor. Upgrading the quality of earnings in MFIs is an important issue for donors. Our future research will focus

on how to attract donors through improved earnings management design in African MFIs. This conclusion preserves the importance of the trade-off between outreach and sustainability, as it would better enable MFIs to reach higher levels of outreach (by taking "smart subsidies") without compromising their financial sustainability.

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