



Microfinance financial sustainability and outreach: is there a trade-off?

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Abstract

The financial sustainability of microfinance institutions (MFIs) is crucial for the continual existence of the microfinance industry. As a result, emphasis has been placed on the financial sustainability of MFIs over the past few years. However, with the primary goal of the industry being the attainment of social outreach, the emphasis on financial sustainability has raised concerns about a potential adverse effect on outreach. Using data on 1595 MFIs in 109 countries, we examine if there is a trade-off between financial sustainability and outreach. The evidence shows that there is a trade-off between sustainability and outreach depth, but complementarity between sustainability and outreach breadth.

Keywords Microfinance · Outreach · Sustainability · Profitability

JEL Classification G21 · L31

1 Introduction

Over the past few decades, microfinance institutions (MFIs) have excelled in providing tailored products and services, especially uncollateralized loans to the poor (Yunus 2008). In the funding of microfinance (MF) activities, which include microloans, micro-savings, micro-insurance, and other non-credit services such as vocational and entrepreneurial training, most MFIs do not depend largely on client savings/deposits as a primary source of funds but rather attempt to function on the basis of self-sufficiency (Christen and Drake 2002). Through the implementation of various policies and the design of client-specific products and services, the microfinance industry has been characterized by high loan repayment rates (Dichter 1999).

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The realization of high loan repayment rates is, however, no indication of profitability, as the industry is faced with the challenge of dealing with high transaction costs of delivering services to the poorest (Dehem and Hudon 2013; Navajas et al. 2000). Serving the poorest in society comes with very high transaction costs given that they usually demand smaller loans. Thus, even with high repayment rates, high transaction costs associated with service to the poorest tend to hinder self-sufficiency. As a result, MFIs have been beneficiaries of significant subsidies and support from various donors, making it possible to serve clients more efficiently (D'Espallier et al. 2013). Consequently, a large number of MFIs rely heavily on the unhindered flow of subsidies and donor funds (Becchetti and Pisani 2010; Hudon 2010; Hudon and Traca 2011; Morduch 1999).

However, with the growth and expansion of the industry, it is argued that subsidies and donor support cannot sustain microfinance (see, e.g. D'Espallier et al. 2013). Thus, in addition to the key objective of outreach to the poor, policymakers and practitioners also emphasize financial sustainability given that donor funds are not sustainable in the long run. This emphasis on financial sustainability has led to some tension within the industry, with arguments suggesting that focussing on financial sustainability may adversely affect the social mission of outreach, and vice versa (see, e.g. Zeller et al. 2003; Olivares-Polanco 2005; Wry and Zhao 2018). Existing studies have thus sought to examine the potential trade-off between financial sustainability and outreach. Two notable studies on the subject include Cull et al. (2007) and Quayes (2012), but both studies only explained the relationship between financial sustainability and depth of outreach but not breadth of outreach.¹

We extend the studies conducted by Cull et al. (2007) and Quayes (2012) by examining the trade-off between financial sustainability and outreach, taking into account the differences between outreach depth and outreach breadth. Thus, our study also captures the association between financial sustainability and breadth of outreach, which has not received much attention in the existing literature. We divide outreach into depth and breadth, and investigate the relationship between these two types of outreach and financial sustainability. This distinction is particularly important given existing theoretical discussions that lend support to potentially different effects of financial sustainability on the two types of outreach.²

Our results support the idea of a trade-off between financial sustainability and outreach depth but complementarity between financial sustainability and outreach breadth. Given the trade-off between financial sustainability and outreach depth, our results support advocates of the continual provision of subsidies for MFIs. The continual existence of subsidies can make MFIs focus on outreach depth given that focussing on either goal presents detrimental effects to the other.

The remainder of our study is structured as follows. The next section presents an overview of the related literature. Section 3 discusses the data and variables, while Sect. 4 presents an overview of the empirical methods. Section 5 presents and discusses our results. Section 6 concludes.

¹ Outreach breadth captures the scope of MFI operations and is often measured by the number of clients. Outreach depth, on the other hand, refers to the 'quality' of outreach, and thus captures outreach to the poorest in society (Schreiner 2002). Further exposition on both outreach aspects is provided in Sect. 3.

² See discussions in Sect. 2.

2 Related literature

2.1 Conceptual arguments and hypotheses

At the heart of the current debate on the dual goals of microfinance, comes the commonly used term, mission drift. This term is often associated with trade-off, and in some cases, has been used interchangeably. Given the initial focus to help alleviate poverty, MFIs have accepted outreach to the poor to be their primary mission (Copes-take 2007; Mersland and Strøm 2010). Thus, with the primary mission of MFIs being their social goal of reaching out to the poorest, the existing literature proposes the possibility of MFIs drifting away from the social mission in an attempt to attain financial sustainability (Mersland and Strøm 2010). Mission drift is therefore a situation where outreach depth is negatively affected in an attempt to attain financial sustainability or other profitability-related pursuits. The occurrence of mission drift is usually characterized by a change in focus from the poorest to relatively wealthier clients. The idea of mission drift is therefore a one-directional effect of the trade-off concept (Cull et al. 2007).

Accordingly, trade-off in the sustainability-outreach literature refers to a situation where MFIs are perceived to be unable to attain financial sustainability while reaching out to the poorest in society, and thus it is argued that the objectives of financial sustainability and social outreach tend to conflict (see, e.g. Battilana and Dorado 2010; Kent and Dacin 2013). First, some potential borrowers have been identified as extremely poor, with no reliable income source. Borrowers in this category also lack collateral and the opportunity to start and/or maintain microbusinesses towards loan repayments and meaningful livelihoods. Second, some poor borrowers live in sparsely populated and remote areas, and lending to such people can be costly. With the view of covering such costs, some MFIs tend to charge very high interest rates. Failure to reach out to such category of clients is tantamount to a drift from the social goal of MFIs. On the other hand, serving these clients is very costly and can influence financial sustainability. In this dilemma, it is proposed that when MFIs attempt to reach out to the poorest, they become unsustainable. However, if they attempt to attain financial sustainability, they forgo their social goal of reaching out to the poorest; hence,

Hypothesis 1 Tensions exist between services to the poor and MFI financial viability, and this leads to a trade-off between MFI financial sustainability and depth of outreach.

Contrary to the arguments supporting the trade-off between outreach and financial sustainability, another school of thought proposes that financial sustainability and outreach in microfinance should be seen as complementary objectives and that a trade-off would not necessarily occur (see, e.g. Rhyne 1998; Woller 2007; Mersland and Strøm 2010). Arguments here suggest that an expansion in outreach, which is characterized by an increase in the number of clients (i.e. outreach breadth), would help MFIs reduce costs as potential transaction costs increase at a decreasing rate with more clients. This reduction in transaction costs assists towards the attainment of financial sustainability in the long run. However, increasing number of clients reflects outreach breadth and not depth of outreach (quality of outreach). Thus, the proposed complementary relationship between financial sustainability and outreach does not

distinguish between outreach depth and outreach breadth. We therefore argue that distinguishing between outreach breadth and outreach depth places the assumption of complementarity between the dual goals of financial sustainability and outreach into perspective, and thus we propose that:

Hypothesis 2 Financial sustainability and breadth of outreach (not depth of outreach) are complementary.

2.2 Overview of existing findings

Examining mission drift has been the focus of several studies although in some of these studies the term trade-off is used instead of mission drift (Bos and Millone 2015; Casselman and Sama 2013; Hishigsuren 2007; Kar 2013; Serrano-Cinca and Gutierrez-Nieto 2012; Xu et al. 2016). Nonetheless, several studies present arguments in favour of the existence of a trade-off between financial sustainability and outreach (see, e.g. Conning 1999; Hulme and Mosley 1996; Zeller et al. 2003). In these studies, it is argued that in an attempt to attain financial sustainability, MFIs reach out to the ‘better-off’ of the poor rather than the poorest (Chowdhury 2009; Epstein and Yuthas 2010). Similarly, Mosley (1996), in an attempt to examine the nature of non-governmental organizations (NGOs) transitioning into commercial banks, came to the conclusion that attaining financial self-sufficiency and poverty reduction is often conflicting.

Cull et al. (2007) consider a sample including 124 MFIs across 49 countries and examined the linkage between financial performance and outreach. Their focus was to ascertain whether an increase in profitability of MFIs is associated with a decreasing trend of outreach to the poor. Their results suggest that MFI profitability and service to the poor (i.e. relatively wealthy clients) can be achieved concurrently. However, in reaching out to the poorest, there is evidence of a trade-off. This study also points to specific trends with regard to the lending methods used by MFIs. They found that MFIs that adopt the individual lending approach have higher rates of profitability; however, they tend to reach out to a smaller proportion of the poorest as well as female borrowers.

Relatively few studies provide evidence to support the complementarity of financial sustainability and outreach. For instance, Fernando (2004) found that MFIs improved their financial standings significantly and yet did not drift away from their social mission. Hishigsuren (2007) considers a sample from Bangladesh and finds no significant trade-off between outreach and MFI cost efficiency. Similarly, Makame (2008) provides evidence from Africa which suggests that both goals can be achieved simultaneously.

Some studies have attempted to examine the effects of MFI commercialization on the dual goals of microfinance. The underlying logic here suggests that microfinance commercialization makes it possible for MFIs to reach out to the poorest in society given that commercialized MFIs have the added advantage of exploring new (capital) markets, resources and financial products (see Rhyne 1998; Christen and Drake 2002; Gonzalez-Vega et al. 1996).

Christen (2001), based on a sample of MFIs from Latin America, indicates that there is no evidence to suggest that commercialization as an approach to becoming sustainable would make MFIs drift away from their social goals. However, in that same study, the author infers that commercialization could potentially lead to a bias that excludes the poorest. Cull et al. (2007) also presents evidence which suggests that MFIs that attempt to commercialize usually extend larger average loans to their clients, and this makes them move away from female borrowers. With regard to regulation, Hartarska and Nadolnyak (2007) find no evidence of significant effects of regulation on both financial sustainability and outreach. On the contrary, the study by Makame (2007) found a negative effect of MFI regulation on outreach.

Several other studies attempt to examine the trade-offs phenomenon in microfinance, with findings suggesting either the presence or absence of a trade-off (see, e.g. Adhikary and Papachristou 2014; Annim 2012; Bassem 2012; Hermes et al. 2011; Nurmakhanova et al. 2015; Von Pischke 1996; Zerai and Rani 2012). However, these studies are limited in terms of scope (for instance the sample covered), and also mostly fail to address issues of endogeneity. More importantly, while the literature emphasizes the distinction between outreach depth and outreach breadth (Schreiner 2002), existing empirical studies often do not take this distinction into account in their analyses and tend to focus mostly on outreach depth.

This current study seeks to bridge this gap by dealing with issues of endogeneity and by addressing concerns regarding appropriate measures of outreach. We also put into perspective the distinction between outreach breadth and outreach depth and provide evidence on the effects of financial sustainability on each outreach dimension.

3 The data and variables

3.1 Data

This study uses a substantially larger dataset than any of the previous studies in this area of enquiry. This dataset is drawn from the Microfinance Information Exchange³ (or the MIX Market) database. The MIX market (the MIX) provides a web-based platform which contains extensive information about MFIs. Several studies (see, e.g. Awaworyi Churchill 2017; Cull et al. 2007; Hartarska and Nadolnyak 2007; Kai 2009; Quayes 2012) have used data from the MIX market database. This publicly available data platform contains information self-reported by MFIs to the MIX. Conventionally, some level of bias can be associated with self-reported data, and thus such data are often alleged to be of poor quality (Chan 2009). However, data reported to the MIX are closely monitored. MFIs that report to the MIX are required to enclose documentation such as audited financial statements to support the data (Galema et al. 2011). The MIX further conducts its own audits, and subjects reported data to more than 134 quality checks and an audit system with over 150 audit rules (<http://www.mixmarket.org>). However, it is worth noting that the sample of MFIs from the MIX is non-random as

³ MIX Market is a not-for-profit organization that promotes information exchange within the microfinance industry.

MFIs decide whether or not to disclose information for inclusion into the database, and this may affect the distribution of MFIs in terms of size.

Further, the quality disclosure of each MFI varies and thus, the MIX market uses a rating system to rate MFIs based on the level and quality of data disclosure. This rating system assigns a score of 1 to 5 to MFIs with 5 being the highest data quality which reflects thorough audits and transparency in data reporting. It suffices to say that results drawn from data of high disclosure firms may be more reliable. However, this does not necessarily relegate MFIs with lower disclosure. We argue that the exclusion of firms with lower disclosure suggests that a large number of MFIs would be excluded and this would affect the representativeness of our data. Further, in most cases, older and bigger MFIs tend to have better audits compared to younger and smaller ones. Hence, the exclusion of MFIs with a lower disclosure rating could imply the exclusion of a large category of MFIs (i.e. relatively young/new MFIs). Nonetheless, keeping the variability of disclosure quality in mind, in robustness checks reported in the appendix, we divide our sample into low disclosure (MFIs rated 1 and 2) and higher disclosure (MFIs rated 3, 4 and 5) to examine if the inclusion of low disclosure MFIs in our sample drives our results differently.

The data used is an unbalanced panel dataset which includes data on 1595 MFIs in 109 countries from 2005 to 2014. Of the 1595 MFIs included in this study, 289 are from South Asia (SA), 297 from Africa, 281 from Eastern Europe and Central Asia (EECA), 215 from East Asia and the Pacific (EAP), 449 from Latin America and the Caribbean (LAC), and lastly, 64 from the Middle East and North Africa (MENA). As of the year ending 2014, the MIX reports information on about 2600 MFIs. Thus, our sample reflects over 60% of the population in the MIX. The reduced coverage is as a result of data availability issues. Further, our sample period of 2005 to 2014 restricts the inclusion of MFIs that for various reasons did not report information to the MIX beyond 2004. To preserve the panel dimension of our dataset, we also exclude firms that do not report more than 2 years of observations for the sample period considered.

An important feature of the data is the information on the profit status of MFIs. MFIs are classified as not-for-profit organizations and for-profit organizations. 966 or 60.56% of the MFIs included in this study fall under the category of not-for-profit organization and the remaining 629 or 39.44% are for-profit MFIs. MFIs that fall under the former category are listed as credit unions, cooperatives, and NGOs. For MFIs that fall under the latter category, they are listed as rural banks, non-bank financial institutions and banks that provide microcredit. Intuitively, it is expected that not-for-profit MFIs would attain better outreach depth, while for-profit MFIs, on the other hand, would achieve better financial performance. Our study focuses on these variations in MFIs with the aim of identifying if empirical evidence varies with MFIs in each category, and thus our data enables us to conduct a complete analysis that considers the MFIs' age, profit status, and geographical area.

3.2 Variables

3.2.1 Outreach

Outreach refers to the goal of extending as much microfinance services as possible (Kent and Dacin 2013). There are two main dimensions to microfinance outreach often discussed in the literature, namely depth of outreach and breadth of outreach (Makame and Murinde 2006; Olivares-Polanco 2005; Schreiner 2002). Breadth of outreach captures the extent to which microfinance promotes financial inclusion, and thus it is often measured by the number of clients served. In some cases, the MFI's branch network can be considered as a viable proxy for the measure of outreach breadth (Khawari 2004; Rosengard 2004). Thus, outreach breadth represents the scale of MFI operations.

In contrast, depth of outreach, attempts to capture how many of the poorest in society MFIs have reached. It is often referred to as the quality of outreach (Quayes 2012), and is controversial to measure. The most commonly used measure of depth of outreach is the average loan size (Hermes et al. 2011), which is used with the assumption that the poorest (with less assets and income) will prefer smaller loans. Despite some level of truth in this argument, a number of concerns can be raised about the validity of this proxy, not the least of which is that average loan size can speak of a general improvement in the welfare of clients, who perhaps were very poor at some point. Measurement issues in microfinance are common (see, Delgado et al. 2015; Hartarska et al. 2010) and in this study, we attempt to provide indices that fill existing gaps in the literature with regard to measurement of outreach and financial sustainability.

MFI depth of outreach index (MFI DOI) Our measure (index) of outreach depth is informed by welfare theory (Bergson 1938; O'Connell 1982). In welfare theory, 'depth' is captured by the weight of a client in the social-welfare function (Bergson 1938; Schreiner 2002). It is the value that society attaches to the net gain of a given client, and thus, if society attaches importance to the poor, good proxies for outreach depth are those that measure poverty (Navajas et al. 2000; Schreiner 2002). Accordingly, a robust measure of outreach depth would require data on the poverty levels of clients which includes information such as their income level and assets base among others. Given that such information is not available, we adopt the average loan size variable often used in the existing literature; however, we deflate this measure by GNI per capita (Cull et al. 2007). Normalizing average loan size by GNI per capita provides an adjustment for the living conditions or wealth of a country. This captures one dimension of outreach depth and to take into account another important dimension; we also include the share of female borrowers.

The share of female borrowers is a commonly used proxy for depth of outreach. Studies on gender and development report that women are relatively poorer than men (see, e.g. Hartarska et al. 2014; Olivares-Polanco 2005) and are also the most vulnerable in society (Bhatt and Shui-Yan 2001). Thus, it is expected that MFIs that serve mostly women would be serving some of the poorest in society and promoting female entrepreneurship. Outreach depth is therefore often associated with gender

distribution of loan portfolio (Bhatt and Shui-Yan 2001; Cull et al. 2007; Navajas et al. 2000).

We put together the share of female borrowers and average loan size/GNI per capita (ALSG) to form the MFI depth of outreach index (MFI DOI). We argue that each indicator (i.e. ALSG and the share of female borrower) captures a unique dimension about outreach depth, and thus an index that puts them together allows us to capture both dimensions of outreach depth.

We adopt an index construction process consistent with the literature to avoid loss of information and ensure our index reflects the dimensions we intend to capture. As part of the measurement index construction process, we first re-scale all variables, making the original reported values fall between 0 and 1. For the share of female borrowers, it is expected that increasing values recorded by MFIs would reflect high outreach and thus, in re-scaling, the highest observed values is assigned the maximum value of 1, while the lowest observed value is assigned 0. All other values fall within this scale and are derived relative to each other. Equation 1 below is used for the re-scaling of this variable.

$$f(x)_t = \frac{(\omega - \alpha)(x_t - A_t)}{\Omega_t - A_t} + \alpha \quad (1)$$

where $f(x)$ is the derived re-scaled value, ω and α represent the maximum and minimum values of the new scale, respectively. Ω and A represent the maximum and minimum original values of the variables reported in the sample, respectively, and lastly, x is the value to be re-scaled.

On the other hand, for ALSG, it is expected that, the smaller the reported value, the higher the depth of outreach and vice versa. Thus, for this variable, we adopt a scale which assigns a value of 1 to the lowest observed value and zero to the highest observed value. Equation 2 below is used in this case.

$$f(x)_t = \left[\frac{(\omega - \alpha)(A_t - x_t)}{\Omega_t - A_t} \right] + \alpha \quad (2)$$

where all terms remain as explained above. As a way of controlling for country size, scaling for both indicators is done at the country level for MFIs in each country. We take the average of the scaled indicators to derive the MFI DOI.

MFI breadth of outreach index (MFI BOI) We argue that existing studies that use total number of borrowers as a measure of outreach breadth in a cross-country setting fail to account for important factors such as share of population below the poverty line, country size and population, among others. This is a crude measure of outreach breadth and thus can bias estimates. For instance, 3000 MFI borrowers in Ghana indicate a much higher breadth of outreach than 3000 MFI borrowers in India given the population size of both countries. Thus, using total number of borrowers as a measure of outreach breadth without any control for size and related factors could be misleading.

This study, therefore, seeks to bridge the gap in the existing literature by introducing a measure that controls for size and other relevant factors. We call this the MFI breadth of outreach index (MFI BOI). To determine this measure, we run the following regression (Eq. 3) where we control for relevant factors such as country size and MFI size, country performance, and poverty levels. Total number of borrowers is the dependent variable in this regression and thus, the residual from this regression can be considered a measure of outreach breadth that controls for both MFI size, country size, and other relevant factors. Econometrically, the residual of a regression can be considered a measure of the dependent variable which excludes the effects of control variables.

$$TB_{ijt} = \alpha + \beta_X X_{jt} + \beta_M M_{it} + \varepsilon_{jit} \quad (3)$$

Let TB_{ijt} be the year- t outcome (total number of borrowers) of MFI i located in country j . X_{jt} is a set of country-level variables describing country j at time t , and M_{it} is a set of microfinance-level variables. With regard to MFI-level controls, we mainly control for indicators of size. Just as country size influences outreach, MFI size has also been shown to influence the number of borrowers MFIs extend loans to Awaworyi Churchill (2017). Thus, it is important to control for MFI size, and thus we include total number of offices and MFI assets to capture size.

For country-level variables, we control for population density which represents country size and percentage of population below the poverty line. Percentage of population below the poverty line represents the prevalence of poverty in a country and thus reflects the number of people that may require microfinance services. We also control for GDP per capita growth, which reflects the economic development of a country. High economic development may increase the demand for microloans given that new niches for microenterprises may emerge. Other country-level variables include manufacturing share of GDP, unemployment rate, remittances share of GDP, and the share of private sector credit to GDP.

Manufacturing share of GDP and unemployment rate reflects the prevalence of wage earning opportunities in the economy and thus could directly affect the number of clients MFIs serve. For instance, a country with very high unemployment rates, in theory, would have more potential clients to serve, as individuals would either borrow for consumption purposes or attempt to start new microbusinesses to make up for lost jobs. Remittances can be considered a source of foreign wage earnings and could determine the number of people who require loans. Lastly, the share of private sector credit to GDP is a widely used measure of financial development, and therefore its inclusion in the regressions controls for the financial depth of a country in which MFIs operate (Ahlin et al. 2011).⁴

3.3 MFI sustainability index (MFI SI)

Financial sustainability in general concerns an MFI's ability to generate sufficient revenue internally to take care of its operating costs. Thus, in most cases, financial

⁴ Data for country-level variables are retrieved from the World Bank's database.

sustainability is associated with measures of short-term and long-term financial performance that can lead to permanency in operations (Cull et al. 2007; Hermes and Lensink 2011; Quayes 2012). Based on this association, most studies consider various measures of financial efficiency and performance as measures of financial sustainability. In general, the existing literature usually makes use of operational self-sufficiency (OSS), profit margin, and return on assets (ROA) as measures of financial sustainability.

However, different indicators of financial performance capture different types of firm efficiency or effectiveness (Dess and Robinson 1984; O'Boyle et al. 2012; Shane and Kolvereid 1995). Thus, we create an MFI sustainability index (MFI SI) based on existing financial outcomes used in the literature with a view of capturing a more holistic perspective of microfinance financial sustainability. This is a common practice in the index construction literature (see, e.g. Khramov and Ridings Lee 2013; Parilla et al. 2014).

OSS is the ratio of financial revenue to the sum of operating expenses, impairment loss, and financial expense. Profit margin is the ratio of the MFI's net operating income to its financial revenue. ROA, on the other hand, is the ratio of the MFI's net operating income less taxes to the average total assets. It serves as a viable proxy for financial sustainability since it reflects the returns MFIs are able to generate from their total assets. Various studies have used ROA as a measure of profitability (see, e.g. Cull et al. 2007; Olivares-Polanco 2005).

For all three indicators of financial sustainability, observed increases suggest good performance in sustainability, and thus we use Eq. 1 for re-scaling. We take the average of all three indicators (scaled) to derive our MFI SI.

4 Empirical strategy

In this study, we adopt the three-stage least square (3SLS) approach as our preferred estimation technique to deal with simultaneity and endogeneity because it is asymptotically efficient relative to other feasible estimators (Greene 2011).⁵ We adopt the general method of moments (GMM) 3SLS estimator which uses the lags of the dependent variables to identify the model and address endogeneity and simultaneity bias.

Specifically, we specify the following simultaneous equation models to help explain the association between microfinance sustainability and outreach:

$$\begin{aligned} \text{SUS}_{it} = & \alpha + \gamma \text{OUT}_{it} + \beta_0 \text{SUS}_{it-1} + \beta_1 \text{LLR}_{it} + \beta_2 \text{LP}_{it} + \beta_3 \text{YLD}_{it} + \beta_4 \text{TE}_{it} \\ & + \beta_5 \text{CPB}_{it} + \beta_6 \text{AGE}_{it} + \beta_7 \text{PRO}_{it} + \beta_8 \text{DIS}_{it} + \sum \beta_k \text{REG}_{ki} + u_{it} \end{aligned} \quad (4)$$

$$\begin{aligned} \text{OUT}_{it} = & \alpha + \gamma \text{SUS}_{it} + \beta_0 \text{OUT}_{it-1} + \beta_1 \text{LLR}_{it} + \beta_2 \text{LP}_{it} + \beta_3 \text{YLD}_{it} + \beta_4 \text{TE}_{it} \\ & + \beta_5 \text{CPB}_{it} + \beta_6 \text{AGE}_{it} + \beta_7 \text{PRO}_{it} + \beta_8 \text{DIS}_{it} + \sum \beta_k \text{REG}_{ki} + u_{it} \end{aligned} \quad (5)$$

⁵ See Dhrymes (1973) for a proof of 3SLS's efficiency relative to the 2SLS.

where SUS is the financial sustainability of a microfinance institution and, as noted earlier, we use the MFI SI here. OUT is outreach, and we use two different measurement indices—the MFI BOI capturing breadth of outreach and the MFI DOI capturing depth of outreach. SUS_{it-1} is the lagged dependent variable in the financial sustainability model and OUT_{it-1} is the lagged dependent variable in the output model.

TE is total equity and LP is gross loan portfolio. LLR is loan loss rate and CPB is cost per borrower. YLD is the real gross portfolio yield and is widely considered in the literature as a measure of interest rates faced by customers. Real gross portfolio yield is used as a measure for interest rate in this study given that it captures the charges borrowers are faced with in terms of interests and also other MFI-related operational charges spread over the loan value. According to Cull et al. (2007), this measure is a reflection of ex-ante interest rates charged by MFIs rather than the ex-post interest realized on the portfolio.

AGE is MFI age dummy. Age-wise, the MIX market presents three classifications of MFIs. MFIs are grouped as new, young, and mature. Based on this classification, we introduce dummies for new MFIs and mature MFIs in our model. Intuitively, we expect that older MFIs would have an advantage in both financial sustainability and outreach, particularly outreach breadth. Older MFIs in most cases have the advantage of more offices and also loan officers, indicators which are highly correlated with the breadth of outreach. In addition, with large assets base, older MFIs are more likely to have higher returns on assets than younger MFIs. Hence, we expect older MFIs to have significant and positive relationships with outreach breadth and financial sustainability.

PRO is MFI profit status dummy and we include a dummy for not-for-profit MFIs. The logic is to understand whether the profit status of MFIs has any bearing on outreach and financial sustainability. Arguably, one would expect that for-profit MFIs are more inclined to be sustainable as compared to not-for-profit MFIs. For-profit MFIs are more likely to be operationally self-sufficient as their revenues including the profit margin are likely to increase. On the other hand, not-for-profit MFIs may have the advantage in terms of increase in outreach depth. DIS represents a dummy variable that controls for MFI data disclosure quality as discussed in the data section. We include a dummy for high disclosure firms. REG represents regional dummies for each main region in the developing world as presented by the MIX, except for the Middle East and North Africa which is in the omitted category to avoid multicollinearity.

Table 1 presents a summary statistics of the variables in our analysis.

5 Empirical results and discussions

Table 2 presents the results for the association between financial sustainability and outreach. Panel A presents results for the association between financial sustainability (MFI SI) and depth of outreach (MFI DOI), while Panel B presents results for financial sustainability (MFI SI) and breadth of outreach (MFI BOI).

From Table 2 Panel A, it is observed that there is a negative association between depth of outreach and financial sustainability. At the 1% significance level, we observe that a standard deviation increase in depth of outreach leads to a decline of 0.18 standard

Table 1 Summary statistics

Variables	Description	Entire sample	For-profit	Not-for-profit
Sustainability index	Index of sustainability	0.4280 (0.0072)	0.4283 (0.0058)	0.4279 (0.0079)
Outreach depth index	Index of depth of outreach	0.2015 (0.1523)	0.1759 (0.1507)	0.2136 (0.1491)
Outreach breadth index	Index of breadth of outreach	0.2139 (0.4171)	0.0387 (0.4093)	- 0.0088 (0.4110)
Log female borrowers	Share of female borrowers	- 0.5584 (0.6164)	- 0.6323 (0.6191)	- 0.5187 (0.6117)
Average loan size/GNI	Average loan size/GNI per capita	- 1.1485 (1.3167)	- 0.9092 (1.3793)	- 1.2895 (1.1727)
Loan loss rate	MFI loan loss rate	0.0827 (4.3661)	0.0313 (0.4759)	0.0504 (1.1031)
Cost per borrower	Operating expense/number of active borrowers	4.6023 (1.3481)	4.9051 (1.3571)	4.4071 (1.2623)
Yield	(Yield on gross portfolio (nominal) - inflation rate)/(1 + inflation rate)	0.3373 (0.2054)	0.3638 (0.2229)	0.3197 (0.1837)
Total equity	Total of all equity accounts	14.5716 (1.7836)	15.0185 (1.7593)	14.2763 (1.7378)
Gross loan portfolio	All outstanding client loans	0.7707 (0.2063)	0.7582 (0.2511)	0.7788 (0.1698)
Mature MFI	Dummy variable, mature MFI = 1	0.5919 (0.4915)	0.5238 (0.4995)	0.6601 (0.4737)
New MFI	Dummy variable, new MFI = 1	0.1582 (0.3649)	0.2149 (0.4108)	0.1164 (0.3207)
Not-for-profit	Dummy variable, not-for-profit MFI = 1	0.5682 (0.4954)		

Mean and standard deviation (in brackets) of sample based on data from MIX market

deviations in financial sustainability. Similarly, at the 1% significance level, a standard deviation increase in financial sustainability leads to a relatively larger decline of 0.33 standard deviations in the level of outreach depth. This suggests that although MFIs that serve the poorest in society end up having a decline in their financial sustainability levels, the effects of focussing on financial sustainability is more detrimental to depth of outreach. This result also indicates that MFIs that focus on financial sustainability drift away from their social mission of reaching out to the poorest. Comparing the magnitude of the standardized coefficients, we observe that the effect of financial sustainability on depth of outreach, and also that of depth of outreach on financial sustainability are mostly stronger than the effects of other regressors on outreach and financial

Table 2 Sustainability and outreach (3SLS regressions)

Variables	Panel A		Panel B	
	Outreach = depth		Outreach = breadth	
	MFI SI	MFI DOI	MFI SI	MFI BOI
Outreach index	− 0.0490*** (0.0050) [− 0.1783]		0.1186*** (0.0137) [0.1275]	
Sustainability index		− 1.2156*** (0.0998) [− 0.3341]		0.0499* (0.0273) [0.0493]
Sustainability index _{t−1}	0.0410* (0.0210) [0.0415]		0.3791*** (0.0468) [0.2317]	
Outreach index _{t−1}		0.0369** (0.0146) [0.0393]		0.4107*** (0.0316) [0.4034]
Gross loan portfolio	0.2919*** (0.0858) [0.1103]	− 0.0121 (0.0133) [− 0.0166]	0.3234** (0.1316) [0.1449]	0.7127*** (0.2074) [0.3232]
Total equity	0.0578*** (0.0039) [0.1885]	0.0004 (0.0015) [0.0046]	0.0628*** (0.0045) [0.2365]	− 0.0101** (0.0041) [− 0.0384]
Yield	0.3715*** (0.0129) [0.4631]	0.6598*** (0.0522) [0.2261]	0.1468*** (0.0479) [0.0607]	0.0668 (0.0548) [0.0279]
Cost per borrower	− 0.0737*** (0.0018) [− 0.6134]	− 0.2301*** (0.0139) [− 0.5262]	− 0.2084*** (0.0106) [− 0.5573]	− 0.1574*** (0.0123) [− 0.4159]
Loan loss rate	− 0.2102 (0.1980) [− 0.0492]	0.0172* (0.0100) [0.0146]	− 0.2226 (0.2113) [− 0.0670]	− 0.1301** (0.0516) [− 0.0396]
Mature MFI	− 0.0067 (0.0138) [− 0.0056]	0.0073** (0.0033) [0.0224]	0.0191 (0.0152) [0.0183]	0.0198 (0.0163) [0.0192]
New MFI	− 0.1076*** (0.0330) [− 0.0575]	0.0079 (0.0052) [0.0154]	− 0.2103*** (0.0398) [− 0.1239]	0.0163 (0.0252) [0.0097]
Not-for-profit MFI	0.4653 (0.4212) [0.4649]	0.0165*** (0.0029) [0.0539]	0.8313 (0.6066) [0.9417]	− 0.0246** (0.0125) [− 0.0222]
MFI disclosure rating	− 0.0203 (0.0189) [− 0.0163]	− 0.0499* (0.0273) [0.0203]	− 0.0122 (0.0172) [− 0.0114]	− 0.0021 (0.0053) [− 0.0501]
Constant	39.7343*** (2.5941)	0.6017 (0.5055)	28.4541*** (2.3555)	4.2761*** (1.4939)
Regional dummies	Yes	Yes	Yes	Yes

Table 2 continued

Variables	Panel A		Panel B	
	Outreach = depth		Outreach = breadth	
	MFI SI	MFI DOI	MFI SI	MFI BOI
Observations	5895	5895	4720	4720
Hansen J-test	92.975	201.564	115.321	98.321
(<i>p</i> value)	0.1100	1.0000	0.1344	1.0000
AR(2) test	− 0.3814	1.6514	− 0.9824	2.6011
(<i>p</i> value)	0.7506	0.0875	0.9197	0.2671

Standard errors in parentheses and Standardized coefficients in brackets

Hansen J-test denotes to the over-identification test for the restrictions in GMM 3SLS estimation

The AR(2) test is the Arellano–Bond test for the existence of the second-order autocorrelation in first differences of residuals

****p* < 0.01, ***p* < 0.05, **p* < 0.1

sustainability. This indicates that the simultaneous relationship between outreach and financial sustainability is economically significant with practical relevance.

From Panel B, we observe that for breadth of outreach and sustainability, there is a positive association in both directions. Thus, unlike in the case of Panel A, results from Panel B show that the relationship between sustainability and breadth of outreach is complementary. Specifically, at the 1% significance level, a standard deviation increase in breadth of outreach, leads to an increase in 0.13 standard deviations in financial sustainability. Similarly, a standard deviation increase in sustainability leads to an increase in 0.05 standard deviations in breadth of outreach.

Overall, we find evidence of a trade-off between financial sustainability and outreach depth, and this is consistent with conclusions drawn by one strand of the existing literature (see, e.g. Hermes et al. 2011; Makame and Murinde 2006; Olivares-Polanco 2005). On the other hand, our results do not seem to support the findings of Quayes (2012), who adequately deal with issues of endogeneity and simultaneity. They find a complementary relationship between financial sustainability and depth of outreach.

The patterns we observe with regard to the trade-off between financial sustainability and outreach depth, as well as the complementarity between financial sustainability and outreach breadth, support hypotheses 1 and 2. The observed complementarity between sustainability and outreach breadth could be because an increase in outreach breadth reduces the marginal cost of serving an additional borrower, and thus increases financial inclusion (Epstein and Yuthas 2010). Coupled with increased loan repayments that allow MFIs to survive (Khavul 2010), the dual goals of financial sustainability and outreach breadth complement each other. On the other hand, if we focus on outreach depth, MFIs seeking to attain legitimacy as financially viable institutions inadvertently drift away from the social goal of outreach to the poorest, leading to mission drift (Kent and Dacin 2013).

We argue that assuming wider outreach (outreach breadth) to entirely represent the goal of poverty alleviation is another cause of the trade-off. Our findings suggest that the idea of complementarity between financial sustainability and outreach only exists when outreach is examined in the context of outreach breadth. Thus, the argument that an increase in outreach lowers transaction costs and thus increases financial inclusions would mostly hold only if relatively richer clients ('better-off' of the poor) are served. Put differently, the complementarity between financial sustainability and outreach breadth is not surprising considering that in most cases, when MFIs expand their outreach breadth, the majority of the clients covered are relatively rich (i.e. the poor but not the poorest) (Chowdhury 2009; Simanowitz 2011).

The confirmed existence of a trade-off between financial sustainability and depth of outreach also points to the existence of mission drift. For all socially driven MFIs, mission drift has been identified as a major concern (Cull et al. 2007). Panel A of the results shown in Table 2 provide evidence of a concern for mission drift given the negative association between sustainability and outreach depth.

Overall, focus on financial sustainability leads to a decline in the level of outreach depth but an increase in the level of outreach breadth. This relationship is expected, given that when mission drift occurs, MFIs may still expand in terms of the breadth of outreach; however, fewer vulnerable and poorer clients would be served. In essence, focussing on financial sustainability leads to mission drift but this re-orientation from the poorest in society to relatively wealthier clients does not have negative effects on the number of people MFIs serve. Overall, the clients' base of MFIs is still expanded except that there is a change in composition of clients.

5.1 Variations by MFI profit status

Table 3 presents results from 3SLS regressions that explain the variations in the relationship between financial sustainability and outreach considering MFI profit status. Panel A presents results for for-profit MFIs, while Panel B presents results for not-for-profit MFIs.⁶

It is observed that both not-for-profit and for-profit MFIs are faced with a trade-off between financial sustainability and depth of outreach. However, considering the relationship between financial sustainability and breadth of outreach, we find evidence of a trade-off in the case of not-for-profit MFIs but a complementary relationship for for-profit MFIs. Specifically, from Panel A, we note that an increase in outreach breadth for profit-making MFIs leads to an increase in sustainability and vice versa. While from Panel B, an increase in outreach breadth for not-for-profit MFIs leads to a decline in financial sustainability and vice versa.

⁶ Table 4 in the appendix presents results for robustness exercises where we divide our sample into low and high disclosure MFIs to ensure that these sub-samples do not present systematically different results. We find that the nature of the relationship between outreach and financial sustainability is not altered by the sample type.

Table 3 Sustainability and outreach with profit status variation (3SLS regressions)

Variables	Panel A				Panel B			
	For-profit MFIs				Not-for-profit MFIs			
	MFI SI	MFI DOI	MFI SI	MFI BOI	MFI SI	MFI DOI	MFI SI	MFI BOI
Outreach index	- 0.0150*** (0.0032)		0.0961*** (0.0363)		- 1.0687*** (0.1650)		- 0.0295* (0.0172)	
Sustainability index		- 0.9424*** (0.2564)		0.2862*** (0.0462)		- 0.3713*** (0.0466)		- 0.0564*** (0.0184)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2312	2312	2019	2019	3493	3493	2643	2643
Hansen J-test	93.847	110.449	84.910	59.976	104.834	155.449	99.8346	84.049
(p value)	0.1380	0.1137	0.3325	0.1150	0.2327	1.0000	0.0660	0.0932
AR(2) test	- 1.4857	2.5762	- 1.2501	1.9926	1.4743	1.1155	0.7929	2.1017
(p value)	0.1374	0.0700	0.2113	0.0663	0.1404	0.2647	0.4278	0.0956

Standard errors in parentheses

Hansen J-test denotes to the over-identification test for the restrictions in GMM 3SLS estimation

The AR(2) test is the Arellano-Bond test for the existence of the second-order autocorrelation in first differences of residuals

***p < 0.01, **p < 0.05, *p < 0.1

Generally, it is expected that for-profit MFIs would have the advantage in terms of financial sustainability, as this category of MFIs are more profit oriented. For-profit MFIs generally tend to grow much faster than not-for-profit MFIs. Once MFIs become matured and go beyond their early years with a modest level of clients, the decision to become profitable brings some advantages in terms of financial sustainability to the MFIs, but in most cases, detrimental effects to the poorer clients. This is evident in our results given the lower negative effects (-0.02) of an increase in outreach depth on financial sustainability but a stronger negative effect (-0.26) of sustainability on outreach depth.

All other things being equal, one would expect that higher levels of microfinance clients would promote profitability for a for-profit MFI (Helms 2006). This is evident in our results as they suggest a complementary between outreach breadth and financial sustainability for profit-making MFIs. Not-for-profit MFIs, on the other hand, are faced with a trade-off between outreach breadth and financial sustainability as well. This could be as a result of the calibre of clients they serve (usually poorer clients) and the commitment to the social mission (development logic). Thus, if not-for-profit MFIs are expanding outreach with increasing number of clients who are relatively poorer, tensions would exist between financial sustainability and outreach breadth as well.

Furthermore, MFIs attempt to achieve financial sustainability by introducing high interest rate policies and the negative effect of outreach breadth on financial sustainability may be due to the detrimental effects of extremely high interest rates. When interest rates are high, borrowers tend to default if returns on loans received do not exceed interest charges. For poorer clients, who are the target of not-for-profit MFIs, it is likely clients may not have meaningful businesses that can help generate income to cover loan costs. Thus, with extremely high interest rates, default rates would increase, causing an increase in outreach breadth to affect financial sustainability of not-for-profit MFIs negatively.

6 Conclusion

This study sought to address one major question. Is there a trade-off between microfinance financial sustainability and outreach? Based on data collected for 1595 microfinance institutions, we answer this question considering the variations in outreach.

Our results for the full sample provide evidence of a trade-off between financial sustainability and outreach depth but complementarity between financial sustainability and outreach breadth. Our results also indicate that an increase in financial sustainability leads to a much stronger negative effect on outreach depth as compared to the effects of outreach depth on financial sustainability.

To examine the sensitivity of our results to variations in the sample, we divide the sample on the basis of the profit status of microfinance institutions. In each case, our results support the existence of a trade-off between financial sustainability and

outreach depth. We also demonstrate that for-profit MFIs outperform not-for-profit MFIs in both financial sustainability and outreach breadth, but conversely, we identify that not-for-profit MFIs perform better in terms of depth of outreach. This suggests that not-for-profit MFIs are more socially driven.

In light of these results, the microfinance industry needs to be concerned about the recent emphasis on financial sustainability as it is an impediment to outreach depth. Considering that the focus on financial sustainability has stronger negative effects on outreach depth, the immediate policy recommendation from this study would support the encouragement of MFIs to emphasize on outreach depth rather than financial sustainability, since the effect of outreach on financial sustainability is weaker.

Additionally, more emphasis on the distinction between outreach breadth and outreach depth would be a vital step forward. This will allow practitioners to clearly identify with their social performance not only in terms of numbers reached but also in terms of outreach quality. Furthermore, it is argued that organizations develop the capacity to succeed if new performance requirements are imposed on them (Sauder and Espeland 2009), and thus when new standards informed by social metrics are introduced, MFIs can develop the capacities to succeed (Kent and Dacin 2013).

Future research can consider exploring this relationship in the context of randomized control trials (RCTs). Particularly, the challenge of finding a robust measure of outreach depth, which includes the information on the poverty levels of clients, would overcome with the use of RCTs. Other relevant research agenda worth exploring is to examine if there is a trade-off between outreach breadth and outreach depth. This is an important research agenda that could provide some fundamental insights which explain the trade-off between financial sustainability and outreach depth. Lastly, given that a trade-off between financial sustainability and depth of outreach has been established, a potential future research area is to determine the optimal level of outreach and financial sustainability at which the MFI is most efficient.

Appendix

See Table 4.

Table 4 Sustainability and outreach (variations by MFI disclosure ratings)

Variables	Panel A				Panel B			
	Low disclosure firms				High disclosure firms			
	MFI SI	MFI DOI	MFI SI	MFI BOI	MFI SI	MFI DOI	MFI SI	MFI BOI
Outreach index	- 0.1199*** (0.0307)		0.1446*** (0.0162)		- 0.9416*** (0.1366)		0.0037*** (0.0002)	
Sustainability index		- 0.6265*** (0.0410)		0.4144*** (0.0236)		- 0.3713*** (0.0466)		0.5597*** (0.0208)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1937	1937	1573	1573	3958	3958	3147	3147

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

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