

# Revenue diversification and financial sustainability of microfinance institutions

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## Abstract

**Purpose** – This paper aims to investigate whether revenue diversification affects the financial sustainability of microfinance institutions (MFIs).

**Design/methodology/approach** – The study uses a worldwide panel data set of 443 MFIs in 108 countries for the period 2013–2018 and two-step system Generalized Method of Moments estimation model.

**Findings** – The study finds that revenue diversification has a significant and positive effect on the financial sustainability of MFIs.

**Practical implications** – The findings of this study actually offer important managerial and policy lessons on MFIs' financial sustainability. Microfinance managers and policymakers should consider revenue diversification as a strategy through which MFIs can attain financial sustainability instead of overreliance on donations and government subsidies

**Originality/value** – Unlike previous studies that examined revenue diversification in the context of banking firms, this study contributes to literature by examining the impact of revenue diversification of the financial sustainability of MFIs.

**Keywords** Microfinance, Revenue diversification, Financial sustainability

**Paper type** Research paper

## 1. Introduction

Microfinance institutions (MFIs) have emerged as essential catalysts of financial inclusion and socioeconomic development. MFIs provide credit to small enterprises and rural households that the formal banking institutions consider high-risk borrowers (Abor, 2017). Therefore, MFIs play a significant role in eradicating poverty and fostering entrepreneurial activities by providing collateral-free financial services to the poor (Khachatryan and Avetisyan, 2017). In contrast to banks, MFIs lend small-uncollateralized loans through innovative lending strategies such as group lending and progressive loans (Sangwan and Nayak, 2020).

While MFIs' primary objective is to serve as many poor borrowers as possible (social performance), this goal is only attainable if they are profitable and financially sustainable. Conversely, empirical studies provide evidence that many MFIs cannot cover their operating costs (cost of funds, loan loss expenses and other operating expenses) using their loan interest income; therefore, they are more reliant on subsidies and donations (Lui *et al.*, 2013). One strategy for attaining financial sustainability is increasing interest income by charging higher interest on loans; however, due to the demand side's unique nature, this is not feasible for MFIs (Quayes, 2012). Furthermore, any attempt to reach more clients exposes microfinance to additional credit risks that may negatively affect financial performance

## JEL Classification — G21, L31

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and sustainability. Consequently, MFIs that are not financially sustainable cannot effectively serve the poor. In addition, MFIs are largely undercapitalized since their intermediation model is relatively different from that of banking institutions. While banks depend on customers' deposits for their loanable funds, MFIs are mainly funded from members' forced savings, subsidies and support from individuals, government and NGOs (Al-Azzam, 2019).

Extant literature has also pointed out that funding has significantly dropped in the recent past as donors and government have shifted attention to other priority areas (Adhikary and Papachristou, 2014; Lewis, 2004). Consequently, internal resources are no longer sufficient for a sustained level of social outreach, and as a countermeasure, MFIs are commercializing their services. For instance, MFIs are gradually using commercial funding and mobilizing interest-earning deposits, which studies claim is likely to lead to mission drift, lower the level of outreach (Beisland *et al.*, 2019). The move toward financial sustainability has been fueled further by the growing competition, technological advancements, financial liberalization and government regulation, which adversely affect MFIs' profitability (Hermes *et al.*, 2011).

With the increased push for financial sustainability and commercialization, MFIs are no longer viewed as a universal poverty reduction tool but a key participant in the formal financial sector (Beisland *et al.*, 2019). Proponents of financial sustainability argue that MFIs should apply market-based principles to attain their duo goals: maximizing social wealth (serving more poor people) and economic prosperity (financial sustainability). Again, financial sustainability is an essential ingredient for firms' competitiveness and long-term survival. Given these facts, policymakers and academia continue to interrogate determinants of MFIs' financial sustainability; however, this research area remains among the virgin in microfinance studies. Furthermore, recent studies have overemphasized a few factors such as outreach (Quayes, 2012; Churchill, 2020), capital structure (Bayai and Ikhida, 2018; Bogan, 2012) and quality credit portfolio (Ayayi and Sene, 2010).

A sustainable approach to MFIs' financial sustainability should discourage overdependence on a single revenue source. Marwa and Aziakpono (2015), who examined the relationship between profitability and financial sustainability of Saving and Credit Cooperatives (SACCOs) in Tanzania, concluded that MFIs could attain financial sustainability by reducing their cost per loan and increasing their net revenue. Consequently, MFIs must find innovative ways of boosting their revenue streams; this entails diversifying into nonlending activities such as advisory services, custodial services, underwriting and securities brokerage.

The concept of revenue diversification (RD) is grounded on Markowitz's (1952) Modern Portfolio Theory. The theory's central proposition is that investors can maximize the expected return rate and minimize risk by choosing the right combinations of various assets in the portfolio. By diversifying income streams, firms avoid unexpected downturns of the primary revenue. Extant literature suggests that RD improves the performance of different kinds of firms: savings cooperative societies (Mathuva, 2016), credit unions (Vieira *et al.*, 2019), commercial banks (Hamdi *et al.*, 2017) and nonprofit making entities (Hung and Hager, 2019; Ahmad *et al.*, 2019). Prior studies on RD in the banking sector show evidence of cross-selling and cross-subsidization (Stiroh, 2004). This implies that engaging in nonlending activities may stimulate MFIs' lending business and ultimately improve performance and financial sustainability. Though RD is a probable adaptive response to MFIs' financial sustainability, there is no empirical evidence on the relationship.

This paper contributes to the literature as follows. First, contrary to most previous studies on RD that focused on banking firms' performance, this study investigates the relationship between RD and MFIs' financial sustainability. Second, by establishing the relationship between RD and MFIs' financial sustainability, managers of MFIs will be more informed on the importance of diversifying into nonlending activities and their impact on financial sustainability.

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Consequently, using panel data analysis and a universal sample of 444 MFIs, this study finds evidence that RD influences the financial sustainability of MFIs. The remainder of this study is organized as follows. The following section presents an overview of the microfinance industry. [Section 3](#) presents the literature review, while [Section 4](#) discusses the methodology. [Section 5](#) presents the findings and discussion of the results. [Section 6](#) concludes.

## 2. Overview of the microfinance industry

Since the inception of the Grameen Bank in early 1980, MFIs have achieved astonishing accomplishments over the past four decades. It has demonstrated that poor people are viable customers, created several strong institutions focusing on poor people's finance and began to attract private investors' interest. Historically, MFIs have offered mainly credit to a relatively narrow range of microentrepreneurs whose income hovers around their countries' poverty lines. It is estimated that about 10,000 MFIs exist worldwide. However, the MIX (Microfinance Information Exchange) market database provides financial data for only 755 MFIs. These MFIs serve approximately 89m borrowers and have advanced loans estimated at the US\$ 108.72bn. Regarding the overall funding mix of MFIs, the trend toward commercial funding continues; as of 2018, the leverage ratio stood at 5.172, while the impaired loans stand at the US\$ 2.18bn.

Similarly, the donation received by MFIs stood at the US\$ 20m. The microfinance industry has also witnessed significant technological advancements, which have enabled MFIs to expand their breadth of outreach and cut operating costs. The use of mobile devices and applications in providing financial services has significantly impacted financially excluded communities, particularly in developing countries ([Mwafise and Stapleton, 2012](#)). By adopting mobile banking technologies, MFIs are now offering mobile-phone-based services such as loans, savings and insurance, which have significantly improved their financial performance and social outreach ([Wondirad, 2020](#)). [Reeves and Sabharwal \(2013\)](#) also contend that MFI may reduce the high interest rate associated with administering small loans by turning to mobile banking. In addition to technological advancements, sound and prudent finance sector regulations have been the leading enabler for developing the microfinance sector. Financial sector regulations take two forms – prudential and nonprudential regulation. Prudential regulation ensures the industry's financial soundness, while nonprudential rules entail the institution's business operations, such as fraud prevention and lending policies. Improvements in the sector's regulatory environment have enabled MFIs to grow into specialized banks (microfinance banks), increasing the services they are capable of offering.

Similarly, regulations have strengthened corporate governance within the microfinance industry ([Okoye and Siwale, 2017](#)). Regulation of the microfinance industry is crucial in protecting depositors, promoting investors' confidence and ensuring the financial soundness of MFIs. Recent regulatory reforms across the globe have enabled MFIs to mobilize more deposits from the public and stimulated greater borrowing, hence catalyzing competition, efficiency and access to microcredit, essential to financial deepening ([Hartarska and Nadolnyak, 2007](#)). Consequently, the technological advances in ICTs and the changing regulatory and institutional framework have allowed MFIs to offer a wide range of financial services to the underbanked population in a more commercial way.

## 3. Review of the empirical literature

The financial sustainability of MFIs continues to be a subject of extensive debate between two competing theories: the welfarist theory and the institutional theory. On the one hand, the welfarist theory claims that the number of poor people they serve gauges MFIs' success. This

theory is grounded on the premise that MFIs were established to fight poverty through empowering the poorest of the economically active poor (Marwa and Aziakpono, 2015; Chattopadhyay and Mitra, 2017). On the other hand, the institutional theory suggests that microfinance's primary objective is to create sustainable financial intermediation for the underprivileged (Bhanot and Bapat, 2015; Chattopadhyay and Mitra, 2017). The institutional approach is premised on the understanding that financially sustainable MFIs can provide long-term financial services to more poor people without depending on subsidies and grants, ultimately stimulating the financial system (Morduch, 2000).

Similarly, it has also been argued that providing credit to the poor is very expensive due to the high transaction costs and risks associated with information asymmetry moral hazard (Hermes and Lensink, 2011). As MFIs expand to reach more clients, more information and resources are needed to screen, monitor and enforce loans. Studies have also shown a trade-off between breadth of outreach and financial sustainability of MFIs; aggressive commercialization, targeting profitability and sustainability are likely to compromise MFIs' social mission of reaching out to unbanked people in the world (Churchill, 2018). The trade-off between outreach and financial sustainability of MFIs has dominated in microfinance literature.

A study by Churchill (2020), based on a sample of 1,595 MFIs in 109 countries, found that an increase in outreach breadth for profit-making MFIs led to improved financial sustainability and vice versa but led to a decline in financial sustainability for not-for-profit MFIs and vice versa. Churchill's (2020) findings suggested complementarity between breadth of outreach and sustainability and a trade-off between depth of outreach and financial sustainability. Using data from 217 MFIs in 101 countries for 1998–2006, Ayayi and Sene (2010) found that MFIs' financial sustainability is influenced by the quality of credit portfolios, interest rates, client outreach and the age of MFIs. Furthermore, Quayes (2012), employing data from 702 MFIs operating in 83 countries, found a positive complementary relationship between financial sustainability and outreach depth. In the same research line, Quayes (2015), based on a sample of 764 MFIs from 87 countries, investigated the possible trade-off between outreach and performance and found that greater depth of outreach has a positive impact on the financial performance of an MFI, thus a key driver of financial sustainability. A few studies have also explored the effect of commercialization on MFIs' financial sustainability and outreach. A survey by Bayai and Ikhide (2018) that sought to examine the impact of financing structure on financial sustainability, using a sample of 60 SADC MFIs and data for the period 2005–2010, found that financing structure influenced financial sustainability; however, the impact varied across countries. The study further found that portfolio at risk, cost efficiency and costs linked to deposit attraction influenced financial sustainability. Hoque *et al.* (2011) examined the impact of commercialization on capital structure, mission and MFIs. The authors used panel data for the years 2003–2008. They found that increased commercial debt (leverage) decreased outreach to the poor due to increased capital cost, higher borrowing costs and ultimately higher default rate and increased credit risk.

The studies aforementioned point to an ongoing debate aimed at unearthing MFIs' financial sustainability drivers. Fundamentally, financial sustainability denotes the ability of MFIs to comprehensively cover all their operational and administrative costs – including losses from bad loans, from their revenues from operations. As hybrid entities, MFIs pursue both social and economic objectives. Hence, as they seek to enhance the impoverished population's social welfare, they should also strengthen their financial sustainability by minimizing costs and maximizing revenue (Ndiege *et al.*, 2016). Therefore, MFIs should diversify their revenue activities, preferably by offering related financial services to improve financial profitability and achieve financial sustainability. The theoretical foundation of RD is Markowitz's (1952) Modern Portfolio Theory. According to this theory, RD benefits might

arise from engaging in different uncorrelated income-generating activities. Interest income and noninterest income are uncorrelated (or negatively correlated); therefore, lending institutions with a high share of noninterest income are less exposed to income variability, as possible cyclical declines to interest income are to be compensated by a stable or an increasing noninterest income (Chiorazzo *et al.*, 2008; Sharma and Anand, 2018). Although the concept of RD has been examined extensively in the banking sector, just a few studies have focused on the microfinance sector.

Doan *et al.* (2018) considered 83 countries' data over 2003–2012, assessed the relationship between income diversification and bank efficiency and found that increased income diversification improved bank efficiency. Similar findings were reported by Alhassan (2015), based on a sample of 26 Ghanaian banks and data for the period 2003–2011, and Nguyen and Pham (2020). They looked at Vietnamese commercial banks over the period 2005–2017. Empirical studies have also shown a positive association between RD and bank performance. A survey by Chiorazzo *et al.* (2008) employed a sample of 85 Italian banking firms, and a panel dataset over the period 1993–2003 found a positive and significant relationship between RD and bank performance. Similar results were reported by Meslier *et al.*'s (2014), who considered a sample of 39 universal and commercial banks in the Philippines and data over the period 1999–2005 and Hamdi *et al.* (2017) in their paper that used annual data of 20 Tunisian banks during the period 2005–2012 and Dynamic Panel Data model. Again, RD has been linked to cross-subsidization and cross-selling, which improves the lending business and eventually improves profitability (Cosci *et al.*, 2009; Abedifar *et al.*, 2018). In the context of MFI, Bergsma (2011) found that MFIs that offer microsavings are more financially sustainable than those that do not. Additionally, the author found no significant evidence suggesting that MFIs abandoned their most impoverished clients by providing microsavings. Going by the extant literature, by engaging in RD, MFIs will benefit from increased efficiencies, improved financial performance and achieve financial sustainability in the long run. Thus, based on empirical literature and theory, this study conjectures that:

*H1.* RD has a significant and positive effect on the financial sustainability of MFIs.

## 4. Methodology

### 4.1 Data and sample

The study employs secondary data and quantitative methods. Data is extracted from the MIX Market database ([www.mixmarket.org](http://www.mixmarket.org)), a web-based platform that is maintained, supported by macroeconomic data from the World Bank. This database contains extensive financial and outreach information for MFIs. Once the MFIs submit their reports to the MIX Market, the data is converted into US dollars using the prevailing exchange rate. At the time of data collection, it listed the profiles of over 3,114 MFIs from over 122 countries. The sample period is from 2013 to 2018, for at least two reasons: first, to isolate the effects of the global financial crisis of 2007–2009 by considering a cooling-off period two years as suggested by García-Meca and Sánchez-Ballesta (2014). Second, there are too many missing values in the MIX Market database for periods before 2013. Too many missing values can create sample selection bias in favor of a few banks. The inclusion and exclusion criteria are that the firm should have been in operation during the study's period and had data needed for the study. After applying the selection criteria, eliminating missing values and outliers, the sample consists of 444 MFIs with 2,664 MFIs-year observations. Since the study uses the two-step system Generalized Method of Moments (GMM) estimator (one-year lag and two-year lag), the reported observations after regression analysis will be 1776.

#### 4.2 Definition and measurement of variables

In the empirical model, financial sustainability is used as the dependent variable, while RD is the independent variable. The study also includes several control variables (depth of outreach, breadth of outreach, MFI firm size and leverage) as argued in the empirical literature.

**4.2.1 Financial sustainability.** Measurement of MFIs' financial sustainability is a difficult task. However, the widely used financial sustainability indicator is financial self-sufficiency (FSS) (Ayayi and Sene, 2010; Kinde, 2012; Rahman and Mazlan, 2014; Tehulu, 2013). FSS is the ratio of adjusted operating income to adjusted operating expenses, and it is calculated as follows:

$$FSS = \frac{\sum \pi}{\sum X}$$

where *FSS* is the financial self-sufficiency of microfinance institutions,  $\pi$  is the total revenue generated by a microfinance institution. *X* denotes the total expenses for a microfinance institution *i* in the period. *FSS* is expressed in ratio form, where an institution with a value greater than 1 is considered financially sustainable. Other measures of financial sustainability used in previous studies include return on asset (ROA) and return on equity (ROE) (Bayai and Ikhide, 2018; Omri and Chkoundali, 2011; Meyer, 2019). ROA is measured by dividing the net operating income by the institution's total assets in the period. This measure shows the extent to which the institution uses its assets to generate profit. ROE is measured by dividing the institution's net operation income by the average equity of the period. Thus, to check for the results' robustness, we use ROA and ROE, which are also MFIs' performance measures, as dependent variables in the alternative models.

**4.2.2 Revenue diversification.** Following Stiroh and Rumble (2006), Meslier *et al.* (2014), Edirisuriya *et al.* (2015), the study uses the Herfindahl–Hirschman Index (HHI) to measure RD. MFIs' revenue is derived from lending activities (interest income on the loan portfolio, fee and commission income on the loan portfolio, income from penalty fees on loan portfolio) and nonlending operations (investing in government securities, underwriting and consultancy services). Thus, RD is measured as follows:

$$HHI = \left[ \left\{ \left( \frac{FRL}{TFR} \right)^2 + \left( \frac{NLFR}{TFR} \right)^2 \right\} \right]$$

$$\text{Revenue Diversification (RD)} = 1 - HHI$$

where; HHI = Herfindahl–Hirschman index, FRL = financial revenue from loans, NLFR = nonloan financial revenue and TFR = total financial revenue. A higher value of RD indicates a more diversified revenue mix; however, a value of 0 means all revenue comes from one source (complete concentration); 0.5 is an even split (Doan *et al.*, 2018).

**4.2.3 Control variables.** To isolate the effect of RD on the financial sustainability of MFIS, the study controls for several relevant factors as suggested by the empirical literature. There is a trade-off between MFIs' outreach (depth and breadth of outreach) and financial sustainability (Churchill, 2020). The breadth of outreach shows the extent to which microfinance promotes financial inclusion, and thus the number of clients served often measures it. Following previous studies, breadth of outreach is calculated as the natural logarithm of the number of active borrowers (Memon *et al.*, 2020). Depth of outreach attempts to capture how many of the poorest in society MFIs have reached, and it is also referred to as the quality of outreach (Quayes, 2012). Depth of outreach is measured as the average loan size divided by the annual GDP per capita, all in US dollars; a smaller value is an indicator of



greater depth of outreach (Hartarska, 2005; Louis *et al.* 2013). Studies have also shown that the financial performance of MFIs is positively affected by the ratio of debt to equity; less leveraged MFIs have better operational self-sufficiency. Leverage is measured by debt to equity ratio (Quayes, 2012; Bayai and Ikhide, 2018). Firm size is likely to affect sustainability as large MFIs have the advantage of economies of scope. MFIs' size is measured as the natural logarithm of total assets (Lensink *et al.*, 2018).

#### 4.3 Empirical specifications

This study uses the two-step system GMM suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). GMM estimation model has several advantages. First, the GMM estimator addresses the endogeneity problem, common in panel data estimation (Arellano and Bover, 1995; Blundell and Bond, 1998). Second, the GMM estimator also considers the biases that appear due to country-specific effects. Third, GMM helps avoid potential simultaneity or reverse causality among variables. Thus, our model takes the following form:

$$Y_{i,t} = Y_{i,t-1} + Y_{i,t-2} + \beta_1 X_{i,t} + \beta_2 Z_{i,t} + \varepsilon_{i,t}$$

where  $i$  indexes MFIs,  $j$  indexes country and  $t$  indexes year and  $Y_{i,t}$  is the financial sustainability of MFI $_j$  in year  $t$ , while  $Y_{i,t-1}$  and  $Y_{i,t-2}$  are the one- and two-period lagged financial sustainability, respectively;  $X_{i,t}$  represents a vector of MFI RD in year  $t$  of an active MFI  $i$ ;  $Z_{i,t}$  represents a vector of control variables in year  $t$ .  $\varepsilon_{i,t} = v_i + Y_t + \mu_{i,t}$  is the disturbance:  $\gamma_t$  is the unobservable time effects,  $v_i$  is the unobserved complete set of country and MFI-specific effects and  $\mu_{i,t}$  is the idiosyncratic error.

The validity of the GMM estimation model depends on two conditions. First is the validity of the variables used as instruments. Second, lack of second-order serial correlation among residuals. Therefore, we conduct the Hansen test of overidentification restrictions. The null hypothesis (Ho) is that all the restrictions of overidentification are valid. Criteria of rejection/acceptation Prob  $> \chi^2 \geq 0.05$  (5%). If the probability is close to 1, it means that the test's asymptotic properties have not been applied. Therefore, we also must reject Ho (Roodman, 2009). Additionally, we report the Arellano–Bond (AR) test of second-order correlation. The null hypothesis: Ho: of this test is that autocorrelation does not exist. However, AR (1) is usually significant at 5% (AR (1) Pr  $> z < 0.05$ ). Thus, the criteria of rejecting or failing to reject the null hypothesis will be AR (2); probability (Pr  $> z$ ) of AR (2) should be higher than 0.05, implying that the error term is not serially correlated.

## 5. Results and discussion

Before investigating the effects of RD on the financial sustainability of MFIs, the most commonly used descriptive statistics for the variables are calculated: financial sustainability (FSN), ROA, ROE, RD, depth and breadth of outreach, firm size and leverage. Table 1 presents the descriptive statistics of the research variables from 2014 to 2018. As shown, the financial sustainability of MFIs is 1.150 and ranges between  $-1.030$  and  $1.994$ . Comparing the mean FSN and the recommended threshold of 1.00 (100%), this study's findings indicate that the global sample of MFIs can be said to be financially sustainable. However, the value is higher than 1.060 as reported by Ayayi and Sene (2010) but lower than the figures reported by Marwa and Aziakpono (2015), 1.330 and 1.270. Similarly, the minimum value of  $-1.304$  suggests that some MFIs are financially unsustainable. The mean return on asset is 2.1%, which is slightly lower than the international (MIX) benchmark of 3% (ACCION, 2004).

Similarly, the mean ROE of 9.400% further confirms that MFIs reported relatively satisfactory financial performance over the study period. RD has a mean value of 0.132, which

is lower compared to 0.3 reported in the banking sector (Sharma and Anand, 2018; Elsas *et al.*, 2010). While most of the MFIs are highly leveraged, as demonstrated by the mean value of debt to equity ratio of 4.164, the SD of 2.717 coupled with the minimum 0.013 and maximum values of 19.730 confirms a widespread dependence on debt financing as opposed to equity among selected MFIs. The mean value of MFI firm size, measured by the institutions' total asset's natural logarithm, is 17.403, which transformed into their real values they will become \$US36,147,427.330 \$US 206,918.820 and \$US8,100,183,205.340 for the mean, minimum and maximum values, respectively. On average, MFIs are large enough to cover their operational costs and be financially sustainable. The average, minimum and maximum breadths of outreach, measured as the natural logarithm of the number of active borrowers' natural logarithm, were 10.484, 4.883, and 16.005, respectively. The translated values show an average of 35,739 clients per MFI, with some MFIs serving a few as 132 clients and others a considerable number, such as 8,930,652. The average depth of outreach, the average outstanding loan balance per GDP, is 0.634, and the lowest value is 0.011 while the maximum value is approximately 7.678, which is a very extreme case. The high average outstanding loan balance per GDP indicates that MFIs are making far larger average loans; thus, less indigent clients are being served.

Table 2 presents the results for the association between the predictor variables and the outcome variable. The effect of financial performance on the financial sustainability of MFIs is also tested using the ROE and ROA. Model 1 presents regression results for the association between RD and financial sustainability. Model 2 illustrates the regression of ROE on revenue diversification, while model 3 shows the regression output of ROA on RD.

This study's main objective is to examine the effect of RD on the financial sustainability of MFIs. Table 2 presents the results of the GMM estimation model. Model 1 shows the results of financial sustainability as the dependent variable, while model 2 and model 3 show the regression results of ROE and ROA as dependent variables, respectively.

In Table 2, we report the results of the dynamic panel-data estimation (two-step system GMM) and the specification reports of the Hansen J-statistic and the AR (2) and their corresponding *p*-values, which are the basis of test the null hypothesis on whether the instruments are uncorrelated with the error term or not. In our cases, we reject the null hypothesis and conclude that the GMM approach is well specified. Additionally, in the three models, the value of AR (2) is insignificant, implying that we cannot reject the second-order correlation's null hypothesis.

Overall, Table 2 provides consistent and robust evidence that RD in MFIs income is associated with increased profitability and improved financial sustainability. These findings are consistent with those reported by Luu *et al.* (2019) and Chiorazzo *et al.* (2008), who focused on the banking sector. The probable reasons for the positive causality between RD and financial sustainability include the following; first, by engaging in nonlending activities, MFIs can exploit idle resources and leverage their intangible assets such as human capital for

**Table 1.**  
Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
Financial sustainability	2,664	1.150	0.243	-1.304	1.994
ROA	2,664	0.021	0.065	-0.880	0.328
ROE	2,664	0.094	0.198	-0.997	0.999
Revenue Diversification	2,664	0.132	0.116	0.004	0.500
Depth of Outreach	2,664	0.634	1.023	0.011	7.678
Breadth of Outreach	2,664	10.484	1.832	4.883	16.005
Leverage	2,664	4.164	2.717	0.013	19.730
Firm Size	2,664	17.403	1.889	12.246	22.815



Financial sustainability	Model 1 RD	Model 2 ROE	Model 3 ROA
L1	0.437 (0.111)**	0.377 (0.041)**	0.251 (0.057)**
L2	-0.089 (0.040)**	0.062 (0.034)**	0.091 (0.028)**
RD	0.347 (0.080)**	0.342 (0.080)**	0.130 (0.026)**
Depth	0.0023 (0.023)**	0.071 (0.024)**	0.008 (0.001)**
Breadth	0.054 (0.021)**	0.047 (0.022)**	0.019 (0.008)**
Leverage	-0.019 (0.004)**	-0.021 (0.002)**	-0.008 (0.002)**
Size	0.041 (0.021)**	0.058 (0.023)**	0.014 (0.007)
_cons	-0.394 (0.327)	-1.489 (0.309)	-0.419 (0.097)**
Wald $\chi^2(7)$	201.26	214.0	161.09
Prob > $\chi^2$	0.000	0.000	0.000
No. Instruments	19	19	19
No. Groups	444	444	444
Observations	1776	1776	1776
Hansen J-test $\chi^2$	7.51	7.28	7.01
Prob > $\chi^2$	0.111	0.122	0.136
AR (2) test	-1.07	0.50	0.75
Prob > $\chi^2$	0.286	0.618	0.453

**Note(s):** FSN denotes financial sustainability; ROE is the return on equity; ROA is the return on the asset; RD is the revenue diversification; Depth is the depth of outreach; Breadth is the breadth of outreach. The values in parentheses are standard errors of the. Hansen J-test denotes the overidentification test for the restrictions in GMM estimation. The AR(2) test is the Arellano–Bond test for the existence of the second-order autocorrelation in first

Differences of residuals \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Table 2.**  
Dynamic panel-data  
estimation, two-step  
system GMM

sustained competitive advantage. Second, diversification has also been linked to cross-selling and cross-subsidization strategies (Abedifar *et al.*, 2018). MFIs can offer a mix of financial services using the existing client information; again, the nonlending business’s income can improve the lending business by reducing the interest margins. The third explanation is probable economies of scope between lending and noninterest activities, which reduces the average cost of production and enhances cost efficiency.

For the control variables, the findings show that depth of outreach has a positive effect on the financial sustainability of MFI, and the results are consistent with those of Quayes (2012), who found a positive complementary relationship between financial sustainability and depth of outreach. However, the findings contradict studies supporting the trade-off between depth of outreach and sustainability of MFIs (Churchill, 2018). Similarly, the results provide evidence of complementarity between breadth of outreach and financial sustainability, which replicate those of Churchill (2020). Contrary to the trade-off theory, this study finds that expanding both depth and breadth of outreach MFIs can achieve financial sustainability. In contrast, the findings show a negative and significant relationship between leverage and financial sustainability, which is in line with Hartarska and Nadolnyak’s (2007) results. Hence less leveraged MFIs are more financially sustainable than highly leveraged ones. Hartarska and Nadolnyak (2007) attributed this result to a possible link between donors’ willingness to provide equity to financially sustainable MFIs and extend loans to unsustainable MFIs. Again, unlevered MFIs with more endowments would be more efficient in their operations since they do not need to drift from their mission to get additional capital. Comparable to Bogan (2012), the results indicate robust empirical evidence of a positive relationship between MFI size and financial sustainability, suggesting that larger institutions (based on assets) are more financially sustainable. Large firms enjoy advantages such as economies of scale, experience, brand name recognition and market power compared to smaller ones.

Similarly, large MFIs are more accessible to commercial funding and other financial resources, enhancing their financial sustainability.

## 6. Conclusion

Over the last two decades, commercial banks have diversified into nonlending activities owing to declining interest income. Furthermore, studies also show that RD is associated with higher risk-adjusted performance. Unlike previous studies on RD focusing mainly on commercial banks, this paper seeks to examine the relationship between RD and MFIs' financial sustainability. Using a sample of 444 MFIs and a panel dataset from 2013 to 2018 and the two-step system GMM estimation methods, the study finds a positive and significant association between RD and financial sustainability of MFIs. Specifically, RD improves both the performance and financial sustainability of MFIs. These findings resonate with the modern portfolio theory's propositions, which argue that if firms diversify, they will reduce their earnings volatility. Therefore, MFIs with well-diversified income streams are expected to be more financially sustainable compared to those primarily focused on lending.

Similarly, the findings suggest complementariness between outreach (depth and breadth) and financial sustainability. However, the impact of leverage (commercial debt) on financial sustainability is negative. The results reported in this study offer important managerial and policy lessons on MFIs' financial sustainability. Microfinance practitioners and policymakers should consider RD as a strategy through which MFIs can attain financial sustainability. However, some previous studies that focused on the banking sector linked RD to income volatility; hence care should be taken to ensure the safety and soundness of individual MFIs and the whole financial system. Despite the novelty of the findings, the study had several limitations. First, the study considers the aggregate nonloan financial revenue; thus, future studies can look deeper into the various nonloan financial income components that influence MFI financial sustainability. Second, this study used a global sample of MFIs. Therefore, the findings need to be validated by further studies that focus on regions or countries to verify the association between RD and financial sustainability of MFIs. Third, studies focusing on other types of firms, such as cooperatives, insurance companies, commercial banks and sharia-compliant banks, could shed more in-depth insights on RD and financial sustainability causality.

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