# Does the Pursuit of Outreach Consistently Stifle the Financial Performance of Microfinance Institutions in sub-Saharan Africa?

Sydney Chikalipah

March 2020

# Does the Pursuit of Outreach Consistently Stifle the Financial Performance of Microfinance Institutions in sub-Saharan African?

Sydney Chikalipah[*][‡]

March 19, 2020

**Abstract**

We study the relationship between outreach and the financial performance of 479 microfinance institutions (MFIs) in 37 countries of sub-Saharan African (SSA), covering the period 1998 to 2012. This study builds on earlier literature on the relationship between outreach and the financial performance of MFIs across countries. Unlike many prior microfinance studies, we investigate the outreach-financial performance nexus by adopting novel approaches: (i) of linear and non-linear specification, (ii) of solely focusing on SSA, and (iii) of segregating the two-outreach variables into different segments, with the aim of determining the optimal outreach thresholds (or tipping point). By employing the OLS and GMM method, we find evidence indicating a positive and statistically significant relationship between outreach and the financial performance among MFIs in SSA. In addition, providing small microcredits below the USD 600 threshold is associated with lower profitability than larger loans. Equally, we observed that MFIs serving more than 30,000 clients reported a strong financial performance, rather than the MFIs that were serving less than

that threshold. The study findings have implications for the managers and stakeholders with a vested interest in the microfinance industry of SSA.

**JEL Classification**: C32, G21, O12, O16 and O55

**Keywords**: Microfinance, Outreach, Profitability and sub-Saharan Africa.

# 1  STUDY BACKGROUND

Financial sector penetration in sub-Saharan Africa (SSA) is rudimentary, with only about one-third of the adult population having access to formal banking services (Demirguc-Kunt et al., 2018; Asabere et al., 2016). Against this background, the microfinance industry started gaining momentum in the later 1990s, and is increasingly becoming a core of financial inclusion in the region (UN, 2013). In the early years, the microfinance sector was predominantly credit only, but since the early 2000s, the microfinance institutions (MFIs) offer a wide range of products and services; these include micro-consignment, micro-franchise, micro-insurance, micro-leasing and mobile money transfer (Chikalipah, 2017; Johnson, 2000). The incredible growth of the microfinance industry in Africa is precipitated by the egregious failure of several commercial banks to extend affordable financial services to the poor. From early 2000s, the microfinance industry in Africa continues to register phenomenal growth, averaging at 15 percent per annum (Chikalipah, 2019). Despite this growth spectacle, a relationship between the outreach and the financial performance remains a relatively poorly researched area, in the context of the microfinance industry, particularly in the SSA region.

In this paper, we contribute to the literature in this area in several ways. First, we capture outreach using two important dimensions: (i) BREADTH of outreach represents the number of clients served, and (ii) the DEPTH of outreach signifies the poverty level of clients served (poorness).[1] This approach contemporaneously examines the relationship between the two outreach instruments and the financial performance of MFIs. Second, we examine different loan sizes and client outreach thresholds (tipping point) at which the financial performance of microfinance institutions is stifled or augmented in the SSA region. Third, we utilise a much longer historical Microfinance Information eXchange (MIX) dataset covering the period 1998 to 2012. Four, despite SSA being a vast region, limited studies focus on the outreach and financial performance nexus of the MFI sector. Fifth and lastly, we estimate our model with a polynomial in breadth of outreach variable. This experimentation will evaluate the possi-

---

[1] In addition, consistent with a plethora of empirical studies in the microfinance industry, we assume that small loan amounts are predominantly targeted at the poor people (Cull et al., 2007; Hermes & Lensink, 2011; Hermes et al., 2011). This strong assumption is solidified by the fact that about 60 percent of the average loan sizes in our sample are below USD 300 and the mean is USD 580 (refer to Table A3 in the technical appendix). In addition, greater than two-thirds of the MFIs in our sample are non-profit seeking, and focus predominantly on poverty alleviation.

ble existence of the economy or diseconomies of scale, as firms embark on their outreach to the poor.

Empirical evidence on the relationship between outreach and the financial performance of MFIs is ambiguous. For example, some studies performed by Abate et al. (2014); Ambe Shu & Oney (2014); Hermes et al. (2011); Hoque et al. (2011); Morduch et al. (2009); and Copestake (2007), found that there exists an inverse relationship between outreach and the financial performance of MFIs. While some like Chikalipah (2017); Quayes (2015); Adhikary & Papachristou (2014); Vanroose & D'Espallier (2013); Quayes (2011); and Cull et al. (2007), have found evidence that shows that outreach is positively related to the financial performance of MFIs. A separate study by Ayayi & Sene (2010) claimed that outreach has an insignificant influence on the financial performance of MFIs. The mixed evidence among these studies is due to varying methodological approaches. This arises mainly due to their geographical coverage - some studies are country focussed, like Abate et al. (2014) and Ambe Shu & Oney (2014), whereas others incorporated a number of developing countries of the world – e.g Ayayi & Sene (2010) and Cull et al. (2007). Econometrically, we should expect different sample sizes to yield different results, and this is due to Simpson's paradox effect (Wagner, 1982).

Most recently, there are rising trends of MFIs in SSA that are shunning original poor customers and serving better off customers with large loan amounts. This phenomenon is commonly referred to as mission drift, and is being augmented by the commercialisation of the microfinance industry (Copestake, 2007; Mersland & Strøm, 2010). Undoubtedly, the commercialisation of MFIs in Africa has been on the rise, and the forerunners being (i) the K-REP Bank in Kenya, (ii) the Centenary Rural Development Bank in Uganda, and (iii) the National Microfinance Bank in Tanzania. Notwithstanding that, there has been an extraordinary growth of mobile money services in SSA, and that has overcome the issue of mission drift. Correspondingly, mobile money services are phone-based services, which are predominantly managed by Mobile Network Operators (MNOs) that facilitate (i) the transfer of funds, (ii) savings, (iii) microcredit, and (iv) microinsurance. Important to note is that mobile services are currently considered as a tool that is addressing financial exclusion in Africa (Chikalipah, 2018).

The study approach is distinctly empirical and we incorporate different strategic facets. First, to estimate the relationship between the outreach to the poor and the financial performance among MFIs, domiciled in the SSA region, we employ two empirical techniques: (i) OLS, and (ii) System GMM. Second, unlike many previous microfinance studies, we adopt a nuanced and novel approach by segregating the two outreach variables into different segments, with the main aim of determining the optimal outreach thresholds for the MFIs operating in the SSA region. To do so, we utilise the Microfinance Information eXchange (MIX) dataset consisting of over 1400 annual observations with 479 MFIs drawn from 37 countries of the SSA region, which covers the period spanning from 1998 to 2012.

When taken together, our baseline estimates reveal the following. To begin

with, we find evidence that indicates that outreach (Breadth and Depth) is positively and significantly associated with the financial performance of MFIs in SSA. Second, providing small microcredits that are smaller than USD 600 is inevitably less profitable than larger ones. Third, MFIs serving more than 30,000 clients reported favourable financial returns rather than those serving clients in the range of 10,000 and 30,000. Similarly, MFIs serving less than 10,000 clients reported the worst financial performance during the period under review.

The remainder of the paper is structured as follows. The next section revisits the empirical literature focussing on the relationship between the outreach to the poor and the financial performance of microfinance institutions. In section III, we describe the motivating theoretical framework that supports our empirical investigation. Section IV outlines the dataset and methodology. In section V the empirical results are presented and discussed. Section VI offers a summary and concluding remarks for this study. Finally, the Technical Appendix presents further information and results.

## 2    BRIEF REVIEW OF EMPIRICAL LITERATURE

A broad study by Hermes and Lensink (2011) provided a review of empirical studies that focussed on the two dimensions of outreach (breadth and depth) and profitability trade-off in the microfinance industry. The earliest association between breadth of outreach and the financial performance of MFIs was suggested by Copestake (2007), who argued that the pursuit of outreach decreases the profitability of MFIs. Similarly, Hermes et al. (2011) argued that providing relatively small loans, denoting the depth of outreach, is negatively related to cost efficiency. Comparable findings have been reported by Morduch et al. (2009) and Hoque et al. (2011).

Ayayi and Sene (2010) showed that an increase in client outreach does not have a significant influence on the financial sustainability of MFIs. In a related study, Cull et al. (2007) claimed that MFIs can expand the depth of outreach without compromising performance. In contrast, Quayes (2011) found a positive and significant relationship between the financial sustainability and depth of outreach among MFIs. A study by Nakamura (1993) concluded that in smaller loan markets, banks have a fuller picture about the borrower's ability to repay; as such they are subject to fewer agency problems, which allows them to set lower loan rates. In marked contrast, Gonzalez (2008) argued that an increase in loan size from 10 percent of Gross National Income (GNI) *per capita* to 20 percent, can be expected to reduce operating expenses, as a percentage of gross loan portfolio by about 7 percentage points.

Equally, Conning (1999) claimed that a trade-off exists between targeting poor borrowers and sustainability. This situation arises because of the higher operating costs that naturally arise from providing very small microcredits to

poor borrowers. A similar study by Vanroose and D'Espallier (2013) documented evidence indicating that serving more poor clients is profitable, especially in countries with low rates of financial inclusion. Moreover, Quayes (2015) drew a similar conclusion regarding the relationship between depth of outreach and the financial performance of MFIs Kar (2011) argued that MFIs can be sustainable without necessarily increasing average loan sizes. Likewise, Chikalipah, (2017) found that an increase in client outreach is positively associated with the financial sustainability of MFIs operating in SSA.

A study by Abate et al. (2014) was conducted in Ethiopia, and found evidence of a trade-off between outreach to the poor clients and the cost-efficiency of the MFIs in that country. The study results suggested that it is difficult to achieve these two goals, simultaneously. Ambe Shu and Oney (2014) found evidence of a trade-off between outreach and performance among Cameroonian MFIs. A study by Adhikary and Papachristou (2014) showed that both the breadth and depth of outreach are positively and significantly associated with profitability and efficiency among the south Asian MFIs.

A search of the literature on outreach and profitability of the microfinance industry yielded the studies mentioned above; all these studies performed a regression analysis on the relationship between outreach to the poor and the financial performance of MFIs. There is reason to believe that the empirical analysis, described in this study, is the first attempt to provide evidence on the effect of segmented levels of client outreach and loan sizes on the financial performance of MFIs in the SSA region. Furthermore, it should be noted that there is limited literature on the microfinance industry with a sole focus on the SSA region. Thus, this study will attempt to contribute to that specific body of knowledge.

## 2.1 MOTIVATING THEORY

To frame our empirical analysis, we first present the general theory of economies of scale, with careful consideration of the behavioural assumption of cost minimisation (Silberston, 1972). The costs minimisation can be achieved through the division of labour, the integration of systems, the learning effect, and the economy of massed resources (Goisis, Giorgetti, Parravicini, Salsano & Tagliabue, 2009). Moreover, the cost minimisation assumption focuses on efficiency and effective resource utilisation (Gilligan, Smirlock & Marshall, 1984). Therefore, the economies of scale occur when the unit costs decreases as production volume increases. Thus, the baseline economies of scale are computed using a translog cost function of the form

$$\ln\left(\mathbf{C}\right) = \beta_0 + \sum_i \beta_i \, lng_i + \frac{1}{2}\sum_i \sum_j \beta_{ij} lng_i lng_j \qquad (1)$$

$$\mathbf{g} = (\mathbf{xyz})$$

Where: $\mathbf{C}$ is the total costs; $\mathbf{x}$ is a vector of input quantities; $\mathbf{y}$ is a vector of output quantities; and $\mathbf{z}$ is a vector of other inputs such as equity. From this

function, given in Equation (1), the economies of scale are estimated by

$$Scale_{base} = \frac{1}{\sum_{i} \frac{\partial ln C_{CF}}{\partial ln y_i}} \qquad (2)$$

Equation (2) is the inverse of the elasticity of costs to output, so that this measure is bigger than 1 in the case of an increasing return to scale, and smaller than 1 in the case of a decreasing return to scale (Clark & Speaker, 1994).

Finally, in the context of the microfinance industry, we posit that the economies of scale are achieved by reducing the average costs of production when increasing (i) the average loan size, and (ii) the number of customers (Hermes & Lensink, 2011). Nevertheless, this theory does not preclude the likelihood of microfinance institutions experiencing diseconomies of scale, as they embark on the breadth and depth of outreach.

# 3   DATA AND ESTIMATION STRATEGY

We exploit the dataset obtained from the Microfinance Information eXchange (MIX). The raw dataset contained over 1400 annual observations with about 479 MFIs drawn from 37 countries of the SSA region, over the period 1998 to 2012. Tables A1, A2, A3 in the Technical Appendices section reports the 37 countries of SSA sampled for this study, the description of variables, and the descriptive statistics, respectively. In what follows, variables in monetary terms are dollarised (USD) using the official exchange rate at the time of the financial year-end and are inflation adjusted.

Given that, the dataset for this study has a small $\mathbf{T}$ of 15 years and large $\mathbf{N}$ of 479 individual MFIs. Econometrically, the system GMM estimator is the best estimation method designed for such a panel dataset (Windmeijer, 2005). Moreover, the GMM estimator can help to identify the sources of endogeneity and account for heteroskedasticity in the data. Thus, the Blundell and Bond (2000) system GMM estimator is of the following form

$$ROA_{i,j,t} = \boldsymbol{\delta} ROA_{i,j,t-k} + \beta \mathbf{B}_{i,j,t} + \lambda \mathbf{D}_{i,j,t} + \gamma \mathbf{R}_{i,j,t} + \psi \mathbf{S}_{i,j,t} + \varepsilon_{i,j,t} \quad (3)$$

Where: $i$ indexes MFI, $j$ country, and $t$ indexes year; whereas $ROA_{\mathbf{i,j,t}}$ is the Return on Asset of MFI $i$ in country $j$ and in year $t$.[2]   On the other hand

---

[2]In this study, we use the accounting-based measure of financial performance using the Return on Asset (ROA). Moreover, the ROA is a widely used measure of financial performance in the traditional banking and microfinance literature (for a review, see: Chikalipah, 2019; Wintoki, et al., 2012). In particular, the ROA is the most appropriate measure of financial performance as it measures how efficient the firm is in utilising its assets to generate profit. Importantly, the ROA is superior to other measures of profitability including but not limited to (i) return on equity (ROE), (ii) returned on capital employed (ROCE), and (iii) profit margin. Specifically, the ROA is suitable for this study as it captures the fundamentals of the financial performance of MFIs by incorporating the income statement performance and the aggregate assets needed to run a business (Chikalipah, 2019).

$ROA_{i,j,t-k}$ is the one period lagged of the ROA with $\delta$ being the speed of adjustment to equilibrium, with $k$ signifying the number of lags. Equally, $\mathbf{B}_{i,j,t}$ denotes the breadth of outreach of MFI $i$ in country $j$ in year $t$, and $\mathbf{D}_{i,j,t}$ denotes the depth of outreach of MFI $i$ in country $j$ in year $t$. Whereas $\mathbf{R}_{i,j,t}$ and $\mathbf{S}_{i,j,t}$ depict credit risk and firm size of MFI $i$ in country $j$ and year $t$, respectively. The $\varepsilon_{i,j,t} = \upsilon_i + \gamma_t + \mu_{i,j,t}$ is the disturbance term: $\gamma_t$ are the unobservable time effects, $\upsilon_i$ is the unobserved complete set of firm-specific effects, and $\mu_{i,j,t}$ is the idiosyncratic error. Equation (3) is a two-way error component regression model, where $\upsilon_i \sim \left\{ IIN\left(0, \sigma_\upsilon^2\right)\right\}$ is independent of $\mu_{i,j,t} \sim \left\{ IIN\left(0, \sigma_\mu^2\right)\right\}$.

Considering the fact that microcredits usually have a short maturity period of less than a year, $ROA_{i,j,t-k}$ enters Equation (3) with a one period lag. It is reasoned that a one period lag of ROA is enough to capture all the influences of the past on the present. Finally, to control for the unobserved country characteristics, and event shocks that might have happened over the sample period, in Equation (3) we includes year and country dummies.

# 4 EMPIRICAL RESULTS

## 4.1 The Baseline Estimation Results

The results obtained after estimating Equation (3) are summarised in Table 1. Collectively, our estimation results indicate goodness of fit for the two empirical approaches: OLS and system GMM. For example, the specification test: (i) the Hansen test shows no evidence of over-identifying restrictions; (ii) the Arellano-Bond [**AR (2)**] test reveals no evidence of autocorrelation in the error terms; and (iii) The $J$-statistic, produced by the difference-in-Hansen test of exogeneity, show a $p$-value of 0.69, which indicates that we cannot reject the hypothesis that the additional subset of instruments used when estimating Equation (3) in levels is exogenous.

In Table 1, the coefficient of the lagged dependent variable ($ROA_{i,j,t-1}$) is positive and robustly significant at 1 percent. The size of this coefficient measures the speed of adjustment to equilibrium ($\delta$) or conditional convergence. Particularly, the results demonstrate that the ROA of MFIs in SSA is persistent, and returns to the long-run equilibrium at a speed of around 26 to 33 percent per year. Moreover, the partial adjustment continues in subsequent years until the ROA reaches the new long-run equilibrium path. This implies that the effect of outreach on ROA of MFIs is not instantaneous but comes about gradually. The $ROA_{i,j,t-1}$ in the OLS model is marginally higher than in the GMM estimator; this is consistent with observations made by Bond (2002).

In Table 1, the coefficients of breadth and depth of outreach are positive and statistically significant. Specifically, the results suggest that a 1 percent increase in the number of clients served is significantly associated with a 3 to 4 percent increase in the ROA of MFIs in SSA. This is rational considering the economies of scale advantage. Equally, the results of depth of outreach imply that a 1 percent increase in loan amount is related with a 0.2 percent

increase in ROA. This is also plausible given the inherent operating costs that arise when providing small-uncollateralised microcredits. The magnitudes of the coefficients of the two outreach instruments are rather small, indicating that the financial performance (ROA) of MFIs is not only influenced by breadth and depth of outreach, but also by other factors.

Consistent with the theoretical and empirical evidence, our two control variables reveal the following. First, the coefficients of credit risk faced by MFIs, which is captured by the portfolio at risk (PAR), are negative and robustly significant at 1 and 10 percent in the OLS and GMM estimators, respectively. The results show that a 1 percent increase in credit risk is related with a 12 to 14 percent reduction in the ROA of MFIs in the SSA region. Second, the coefficients of firm size are positive and statistically significant in both estimation models. The estimates imply that a 1 percent increase in firm size is associated with a 7 percent increase in the ROA of MFIs in SSA. Furthermore, the coefficient of firm size contemporaneously estimated the advantages of economies of scale as MFIs embark on outreach. The next sub-sections will deal with additional results to verify the robustness of our estimates discussed in this section.

## 4.2 Estimation Results with Polynomial in Outreach.

The most likely objection to the empirical results, as presented in Table 1, is that the effect of outreach on the financial performance of MFIs is non-linear. Therefore, to address this concern we include squared outreach variables in our estimation model. This experimentation requires estimating the following model

$$ROA_{i,j,t} = \boldsymbol{\delta} ROA_{i,j,t-k} + \beta \mathbf{B}_{i,j,t} + \beta \mathbf{B}_{i,j,t}^2 + \lambda \mathbf{D}_{i,j,t} + \lambda \mathbf{D}_{i,j,t}^2 \qquad (4)$$
$$+ \gamma \mathbf{R}_{i,j,t} + \psi \mathbf{S}_{i,j,t} + \varepsilon_{i,j,t}$$

Table 2 presents results derived from estimating the equation (4). Consistently, the estimates of the squared breadth and depth of outreach are negative and statistically significant in both the OLS and GMM models. This implies that the relationship between outreach and the financial performance of MFIs in SSA is non-linear. More precisely, for both breadth and depth of outreach there is more evidence of concave relations – in line with the theory of diseconomies of scale.

## 4.3 Does the Outreach-Performance Nexus Depend on the MFI Charter Type?

We further investigate whether the outreach and the financial performance relationship vary among MFIs with a distinctive established legal charter. MFIs have diverse mission objectives, which are reflected in their established legal charters. Thus, these legal charters are as follows: Cooperatives, Credit Unions and Rural banks (**CCUs & RBs**), Micro-banks (**Banks**), Non-Banking Financial Institutions (**NBFIs**), and Non-Governmental Organisations (**NGOs**).

After segregating the full dataset into sub-samples of MFI types, it was observed that the system GMM estimators could not run on the four sets of sub-samples. It is for this reason that the OLS method is used as the main estimation technique for the four sub-samples.

The results reported in Table 3 are obtained after applying the OLS method on the four sub-samples of established legal charters of MFIs. Consistent with our baseline results, we find further evidence that indicates that outreach and financial performance are positively and significantly related, even among different types of MFIs domiciled in the SSA region.

## 4.4 Results of the Methodical Analysis of the Outreach-Performance Nexus.

We further verify the robustness of our baseline results reported in Table 1 by methodically analysing the relationship between outreach to the poor and the financial performance of MFIs in SSA. In view of that, we apply a methodical technique recently adopted by Rogoff and Reinhart (hereafter RR 2010) in their study. The RR (2010) study has been widely discredited, and much of the criticism focuses on data mining and not on the analysis approach adopted in their study. Indeed, their analysis approach has never been questioned, and can be used in empirical studies. This approach will involve a methodical matching of different loan sizes with the return on assets (ROA) of each MFI for the period 1998 to 2012. This study does the same for the different segments of clients served by each MFI. The results of each MFI are then aggregated and reported per country. The main objective of employing this technique is to determine the optimal breadth and depth of outreach thresholds for MFIs operating in each country of the SSA region.

For this specific statistical analysis, we first selected only those institutions with at least five years of annual financial statements reported to the MIX market over the period considered in this study, which is 1998 to 2012. This approach preserves consistence, and ensures that only MFIs operating for at least five consecutive years are analysed. This process also reduces the risk of outliers, such as newly established MFIs with a limited experience of the industry. To avoid any sample selection bias, we did not require a balanced dataset. Thus, the final dataset for this analysis consists of 917 annual observations, and 107 microfinance institutions located in 20 countries of sub-Saharan African, over the same period, 1998 to 2012. Second, we disaggregated the outreach variables in different sets. Specifically, for the breadth of outreach, MFIs are analysed based on the number of customers served. And the three MIX market classifications are (i) SMALL breadth of outreach for MFIs with fewer than 10,000 clients; (ii) MEDIUM breadth of outreach for MFIs serving between 10,000 and 30,000 clients, and (ii) LARGE breadth of outreach for MFIs serving more than 30,000 clients. In the case of depth of outreach, loan sizes are analysed based on the percentiles shown in Table A3 in the Technical Appendix. Moreover, the loan sizes are as follows: (i) loan sizes less than USD 120; (ii) loan sizes between USD 121 and 250; (iii) loan sizes between USD 251 and 600; and (iv) loan sizes

greater than USD 600.

To start with, we first consider the methodical relationship between the segments of loan sizes and the financial performance of MFIs in the SSA region. Table 4 shows a significant relationship between the loan sizes and the financial performance of MFIs in the SSA region. Noticeably, even though we concentrated on MFIs that are older than five years in operation, the results are not systematically different from the baseline results reported in Table 1. Of course, there are minor variations in the results, which are noticeable in the following countries: Benin, Malawi, Mali and Nigeria. Note, however, that the variations in these six countries do not distort the overall conclusion.

Overall, the results reported in Table 4 reveal that targeting the poor with loan sizes averaging less than USD 600 is typically associated with a poor financial performance. One plausible explanation is that the inherently high administrative costs of providing small-uncollateralised microcredits are greater than the financial returns on those loans (Agier & Szafarz, 2013). Specifically, loan sizes averaging less than USD 120 are correlated with a mean ROA of -9.9 percent; this compares with -2.9 percent for loan sizes between USD 121 and 250. However, loan sizes between USD 251 and 600 were correlated a ROA of -0.2 percent and loan sizes greater than USD 600 were associated with a ROA of 1.6 percent.

We now review the relationship between the breadth of outreach and the financial performance of MFIs operating in the SSA region, and the results are presented in Table 5. The results shown in Table 5 demonstrate that an increase in the number of clients served by an MFI promotes its financial performance significantly: Cameroon, Niger, Nigeria and Rwanda are each a notable exception in those countries considered in this analysis. The LARGE MFIs have been characteristically associated with a mean ROA of 1.5 percent, which compares with -2.4 percent for MEDIUM MFIs, and -6.4 percent for MFIs in the SMALL category. This leads to the conclusion that large MFIs benefit from economies of scale, as illustrated by their relatively strong financial performance between 1998 and 2012.

To summarise, it can safely be concluded that the persistently high microcredit interest rates are partly attributable to unexploited economies of scale and the high inherent costs of providing small loans. In that respect, an increase in client outreach, accompanied by loan sizes of not less than USD 600, could undoubtedly contribute to an improved financial performance of MFIs. This scenario could contribute towards lowering microcredit interest rates in the SSA region, which are persistently high.

## 4.5   Salient Examples from Ethiopia and Nigeria

This section provides examples of non-profit seeking MFIs in Ethiopia and Nigeria, which consistently reported a strong financial performance during the period 1998 to 2012. The reason for this analysis is to reinforce the conclusion that there is profit to be earned from serving the poorest in the communities of SSA. It is important to note that non-profit oriented MFIs were selected be-

cause these firms habitually target the poorest people by providing small loan amounts, with the mission of poverty alleviation (Chikalipah, 2017).

- **ETHIOPIA:** the Ethiopian MFIs in the sample include four non-profit oriented MFIs that consistently reported favourable returns on assets (ROA) between 1998 and 2012. These MFIs are ACSI, ESHET, GASHA and PEACE. They targeted mostly poor people with average loan sizes not exceeding USD 300 over the study period. Unsurprising, the MFIs' most profitable loan amounts were those in the range of USD 121 to 250. This evidently demonstrates that outreach to the poor people in society is profitable with reasonably modest loan amounts.

- **NIGERIA:** the Nigerian MFIs dominated the sample of the most profitable firms in the period 1998 to 2012. The three non-profit seeking MFIs were DEC, LAPO-NGR and SEAP, and they reported an average ROA of not less than 8 percent between 1998 and 2012. The mission of these three MFIs is poverty alleviation, and they targeted the poor with average loan amounts of about USD 200 over this study period. All three MFIs are strongly profitable despite their market orientation and mission objective. These three examples firmly support the conclusion that MFIs can expand their outreach to the poor and remain profitable at the same time.

One possible objection to the Ethiopian and Nigerian examples, above, is that there are many non-profit oriented MFIs in SSA that are recording poor financial results. That viewpoint is correct, yet results have consistently shown that profit can be earned while serving poor people in the communities of the SSA region. Here, the key factors to strong financial performance of MFIs include adopting digital technology to drive operational efficiency accompanied by sound portfolio management strategies. It seems reasonable to believe that the Ethiopian and Nigerian MFIs outlined in this section have done exactly that.

# 5 SUMMARY AND CONCLUDING REMARKS

Given the broad importance of outreach, in both its breadth and depth, and also due to inconclusive findings in the prior empirical studies in the microfinance industry, this merited a further investigation into this particular research area. To do so, we exploited the dataset modified for this appropriate study consisting of 1400 annual observations with 479 microfinance institutions, located in 37 countries of sub-Saharan Africa, over the period 1998 to 2012.

This study builds on earlier literature on the relationship between outreach and the financial performance of MFIs in SSA. Different from previous studies in this particular area, we investigated the outreach-financial performance nexus by adopting linear and non-linear specifications and focussing solely on the SSA region. The main findings of this study are as follows. First, there exists a positive and statistically significant relationship between outreach (both breadth

and depth) and the financial performance of MFIs in SSA. Second, microcredits smaller than USD 600 are strongly associated with lower profitability than larger loans. Third, it was found that MFIs with more than 30,000 clients reported stronger financial returns than those serving between 10,000 and 30,000 clients. Equally, those MFIs serving fewer than 10,000 clients reported the worst financial performance over the period 1998 to 2012.

In conclusion, the significance of our findings is twofold. First, our results provide a broad support for the thesis that MFIs benefit immensely from the economy of scale achieved through an increase in the number of clients served. And, on top of that, there is profit to be earned from providing small uncollaterised loans to the poor, albeit with loan sizes of not less than USD 600. Finally, the study findings suggest that MFIs must be supported to expand outreach, and adopt digital technology to drive operational efficiency. Doing so could contribute to financial inclusion agenda and poverty alleviation in the SSA region.

# References

[1] Abate, G.T., Borzaga, C., & Getnet, K. (2014). Cost-efficiency and Outreach of Microfinance Institutions:Trade-Offs ad the Role of Ownership. *Journal of International Development, 26*(6), 923-932.

[2] Adhikary, S., & Papachristou, G. (2014). Is there a trade-off between financial performance and outreach in south asian Microfinance institutions? *The Journal of Developing Areas, 48*(4), 381-402.

[3] Agier, I., & Szafarz, A. (2013). Microfinance and Gender: Is There a Glass Ceiling on Loan Size? World Development, *42*, 165-181.

[4] Ambe Shu, C., & Oney, B. (2014). Outreach and performance analysis of microfinance institutions in Cameroon. *Economic research-Ekonomska istraživanja*, 27(1), 107-119.

[5] Asabere, P. K., McGowan Jr, C. B., & Lee, S. M. (2016). A study into the links between mortgage financing and economic development in Africa. *International Journal of Housing Markets and Analysis, 9*(1), 2-19.

[6] Ayayi, A, & Sene, M. (2010). What drives microfinance instititution's financial sustainablity? *The Journal of Developing Areas, 44*, 303 - 324.

[7] Barry, T. A., & Tacneng, R. (2014). The Impact of Governance and Institutional Quality on MFI Outreach and Financial Performance in Sub-Saharan Africa. *World Development, 58*, 1-20.

[8] Blundell, R., & Bond, S. (2000). GMM estimation with persistent panel data: an application to production functions. *Econometric reviews, 19*(3), 321-340.

[9] Bond, S. R. (2002). Dynamic panel data models: a guide to micro data methods and practice. *Portuguese Economic Journal*, 1(2), 141-162.

[10] Chikalipah, S. (2017). Financial sustainability of microfinance institutions in sub-Saharan Africa: evidence from GMM estimates. *Enterprise Development and Microfinance, 28*(3), 182-199.

[11] Chikalipah, S. (2018). Credit risk in microfinance industry: Evidence from sub-Saharan Africa. Review of development finance, 8(1), 38-48.

[12] Chikalipah, S. (2019). Optimal sources of financing for microfinance institutions in sub-Saharan Africa. *Development in Practice*, 29(3), 395-405.

[13] Clark, J. A., & Speaker, P. J. (1994). Economies of scale and scope in banking: evidence from a generalized translog cost function. *Quarterly Journal of Business and Economics, 33*(2), 3-25.

[14] Conning, J. (1999). Outreach, sustainability and leverage in monitored and peer-monitored lending. *Journal of development economics, 60*(1), 51-77.

[15] Copestake, J. (2007). Mainstreaming Microfinance: Social Performance Management or Mission Drift? *World Development, 35*(10), 1721-1738.

[16] Cull, R., Demirgü¨ç-Kunt, A., & Morduch, J. (2007). Financial performance and outreach: a global analysis of leading microbanks. *The Economic Journal, 117*(517), 107-133.

[17] Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution.* The World Bank. Washington, DC.

[18] Gilligan, T., Smirlock, M., & Marshall, W. (1984). Scale and scope economies in the multi-product banking firm. *Journal of Monetary Economics, 13*(3), 393-405.

[19] Goisis, G., Giorgetti, M. L., Parravicini, P., Salsano, F., & Tagliabue, G. (2009). Economies of scale and scope in the European banking sector. *International Review of Economics*, 56(3), 227-242.

[20] Gonzalez, A. (2008). Efficiency Drivers of Microfinance Institutions (MFIs): The case of Operating Expenses. Microbanking Bulletin, Autumn 2008. MIX Market, Washington DC, USA.

[21] Hermes , N., & Lensink , R. (2011). Microfinance: Its Impact, Outreach, and Sustainability. *World Development, 39*(6), 875-881.

[22] Hermes , N., Lensink , R., & Aljar , M. (2011). Outreach and Efficiency of Microfinance Institutions. *World Development, 39*(6), 938 - 948.

[23] Hoque, M., Chishty, M., & and Halloway, R. (2011). Commercialization and changes in capital structure in microfinance institutions: An innovation or wrong turn? *Managerial Finance, 37*(5), 414-425.

[24] Kumar Kar, A. (2011). Microfinance institutions: A cross-country empirical investigation of outreach and sustainability. *Journal of Small Business & Entrepreneurship, 24*(3), 427-446.

[25] Johnson, S. (2000). Gender impact assessment in microfinance and microenterprise: Why and how. *Development in Practice, 10*(1), 89-94.

[26] Mersland, R., & Strøm, R. Ø. (2010). Microfinance mission drift?. *World Development*, 38(1), 28-36.

[27] Morduch, J., Cull, R., & Demirgüç-Kunt, A. (2009). Microfinance Meets the Market. *Journal of Economic Perspectives, 23*(1), 167-192.

[28] Nakamura, L. I. (1993). Commercial Bank Information: Implications for the Structure of Banking, in Michael Klausner and Lawrence J. White, etc., *Structural Change in Banking*. Homewood, Ill. (pp.131-160). Business One Irwin. New York, USA

[29] Quayes, S. (2011). Depth of outreach and financial sustainability of microfinance institutions. *Applied Economics, 44*(26), 3421-3433.

[30] Quayes, S. (2015). Outreach and performance of microfinance institutions: a panel analysis. *Applied Economics, 47*(18), 1909-1925.

[31] Rogoff, K., & Reinhart, C. (2010). Growth in a Time of Debt. *American Economic Review, 100*(2), 573-578.

[32] Silberston, A. (1972). Economies of scale in theory and practice. *The Economic Journal, 82*(325), 369-391.

[33] UN (United Nations). (2013). United Nations Report on Microfinance in Africa. (http://www.un.org/en/africa/osaa/pdf/pubs/2013microfinanceinafrica.pdf)

[34] Vanroose, A., & D'Espallier, B. (2013). Do microfinance institutions accomplish their mission? Evidence from the relationship between traditional financial sector development and microfinance institutions' outreach and performance. *Applied Economics, 45*(15), 1965-1982.

[35] Wagner, C.H. (1982). Simpson's paradox in real life. *The American Statistician,* 36(1), 46-48.

[36] Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of econometrics*, 126(1), 25-51.

[37] Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 105(3), 581-606.

# TABLE 1

## THE ESTIMATION RESULTS OF THE OUTREACH-FINANCIAL PERFORMANCE NEXUS AMONG MFIs IN THE SSA REGION. DEPENDENT VARIABLE: ROA

|  | POOLED OLS | SYSTEM GMM |
|---|---|---|
| $ROA_{t-1}$ | 0.330[a] | 0.256[a] |
|  | (0.026) | (0.066) |
| BREADTH of Outreach $(B_{i,j,t})$ | 0.030[a] | 0.041[b] |
|  | (0.011) | (0.019) |
| DEPTH of Outreach $(D_{i,j,t})$ | 0.002[b] | 0.002[b] |
|  | (0.001) | (0.001) |
| Credit RISK $(R_{i,j,t})$ | -0.138[a] | -0.122[c] |
|  | (0.030) | (0.069) |
| Firm SIZE $(S_{i,j,t})$ | 0.068[c] | 0.071[a] |
|  | (0.041) | (0.028) |
|  |  |  |
| Observations | 1109 | 1109 |
| $R$-squared | 0.576 |  |
| Number of Instruments |  | 251 |
| AB Test AR (1) $p$-value |  | 0.004 |
| AB Test AR (2) $p$-value |  | 0.441 |
| Hansen Test $p$-value |  | 1.00 |
| Diff-in-Hansen test of exogeneity $p$-value |  | 0.690 |

**NOTES**: Table 1 reports the estimation results of the relationship between outreach and financial performance of 479 MFIs domiciled in 37 countries of the SSA region for the period covering 1998 to 2012. The dependent variable is a Return on Asset (ROA). The figures in parentheses represent standard errors (SEs). The letters **a**, **b**, **c** denotes significance at 1%, 5% and 10%, respectively. The system GMM procedure follows Blundell and Bond (2000), and the Hansen test is the test for over-identifying restrictions in the GMM model estimation. The null under the Hansen test is that all instruments are valid. Arellano-Bond (AR) tests the serial correlation in the first differenced residuals, under the null of no serial correlation. Thus, the AR (1) and AR (2) refer to the Arellano-Bond first and second-order serial correlation tests, respectively. The Diff-in-Hansen test of exogeneity is under the null that instruments used for the equations in levels are exogenous. All estimations included country and time dummies.

# TABLE 2

## ESTIMATION RESULTS OF NON-LINEAR RELATIONSHIP BETWEEN OUTREACH AND THE FINANCIAL PERFORMANCE OF MFIs IN THE SSA REGION. DEPENDENT VARIABLE: ROA

| | POOLED OLS | SYSTEM GMM |
|---|---|---|
| $ROA_{t-1}$ | 0.339[a] | 0.273[a] |
| | (0.030) | (0.065) |
| BREADTH of Outreach ($B_{i,j,t}$) | 0.044[b] | 0.061[a] |
| | (0.021) | (0.018) |
| BREADTH of Outreach$^2$ ($B_{i,j,t}^2$) | -0.003[a] | -0.005[a] |
| | (0.001) | (0.001) |
| DEPTH of Outreach ($D_{i,j,t}$) | 0.002[b] | 0.003[a] |
| | (0.001) | (0.001) |
| DEPTH of Outreach$^2$ ($D_{i,j,t}^2$) | -0.002[b] | -0.002[b] |
| | (0.001) | (0.001) |
| Credit RISK ($R_{i,j,t}$) | -0.101[a] | -0.124[c] |
| | (0.022) | (0.068) |
| Firm SIZE ($S_{i,j,t}$) | 0.035[b] | 0.049[b] |
| | (0.017) | (0.024) |
| | | |
| Observations | 1109 | 1109 |
| $R$-squared | 0.631 | |
| Number of Instruments | | 288 |
| AB Test AR (1) $p$-value | | 0.003 |
| AB Test AR (2) $p$-value | | 0.420 |
| Hansen Test $p$-value | | 1.00 |
| Diff-in-Hansen test of exogeneity $p$-value | | 0.884 |

**NOTES**: Table 2 reports the estimation results of the relationship between squared outreach and the financial performance of 479 MFIs domiciled in 37 countries of the SSA region for the period covering 1998 to 2012. The dependent variable is a Return on Asset (ROA). The figures in parentheses represent standard errors (SEs). The letters **a**, **b**, **c** denotes significance at 1%, 5% and 10%, respectively. The system GMM procedure follows Blundell and Bond (2000), and the Hansen test is the test for over-identifying restrictions in the GMM model estimation. The null under the Hansen test is that all instruments are valid. Arellano-Bond (AR) tests the serial correlation in the first differenced residuals, under the null of no serial correlation. Thus, the AR (1) and AR (2) refer to the Arellano-Bond first and second-order serial correlation tests, respectively. The Diff-in-Hansen test of exogeneity is under the null that instruments used for the equations in levels are exogenous. All estimations included country and time dummies.

# TABLE 3

## ESTIMATION RESULTS OF THE NEXUS BETWEEN OUTREACH AND THE FINANCIAL PERFORMANCE OF MFIs IN SSA - USING SUB-SAMPLES OF LEGAL CHARTER OF MFIs

| | ESTIMATION MODEL: POOLED OLS | | | |
|---|---|---|---|---|
| | MICRO-BANK | CCU & RBs | NBFIs | NGOs |
| BREADTH of Outreach ($B_{i,j,t}$) | 0.008[a] | 0.005[c] | 0.002[b] | 0.013[a] |
| | (0.002) | (0.003) | (0.001) | (0.005) |
| DEPTH of Outreach ($D_{i,j,t}$) | 0.003[a] | 0.012[a] | 0.008[a] | 0.008[b] |
| | (0.001) | (0.005) | (0.003) | (0.004) |
| Credit RISK ($R_{i,j,t}$) | -0.022[c] | -0.361[a] | -0.175[a] | -0.353[a] |
| | (0.013) | (0.073) | (0.037) | (0.101) |
| Firm SIZE ($S_{i,j,t}$) | 0.018[a] | 0.052[c] | 0.029[c] | 0.014[c] |
| | (0.006) | (0.028) | (0.016) | (0.008) |
| Number of MFIs | 62 | 171 | 124 | 122 |
| Obs. | 241 | 354 | 332 | 287 |
| $R^2$ | 0.552 | 0.475 | 0.345 | 0.721 |
| Adj. $R^2$ | 0.483 | 0.393 | 0.227 | 0.687 |

**NOTES**: Table 3 reports the estimation results of the relationship between outreach and financial performance of 479 MFIs domiciled in 37 countries of the SSA region for the period covering 1998 to 2012. The dependent variable is a Return on Asset (ROA). The figures in parentheses represent standard errors (SEs). The letters **a**, **b**, **c** denotes significance at 1%, 5% and 10%, respectively. The different types of MFIs are abbreviated as follows: (I) **CCUs** and **RBs** denotes Cooperatives, Credit Unions and Rural Banks; (II) **NBFI** stands for Non-Banking Financial Institutions; and (III) **NGOs** represent the Non-Governmental Organisations. Year dummies are included in all specifications. All estimations included country and time dummies.

# TABLE 4

**METHODICAL ANALYSIS OF THE RELATIONSHIP BETWEEN DIFFERENT LOAN SIZES AND THE FINANCIAL PERFORMANCE OF MFIs IN SSA OVER THE PERIOD 1998 – 2012.**

| COUNTRY | Obs. | DIFFERENT LOAN SIZES | | | |
|---|---|---|---|---|---|
| | | BELOW USD 120 | USD 121 to 250 | USD 251 to 600 | USD 600 AND ABOVE |
| 1. Benin | 63 | -15.7 | -8.7 | 1.5 | -0.1 |
| 2. Burkina Faso | 20 | -1.7 | † | 1.9 | 1.7 |
| 3. Cameroon | 22 | † | † | -1.8 | 3.6 |
| 4. Congo, DR | 26 | -5.9 | 0.2 | 3.4 | † |
| 5. Ethiopia | 79 | 1.6 | 4.2 | 2.7 | † |
| 6. Ghana | 71 | -7.8 | 0.9 | 2.6 | 3.4 |
| 7. Kenya | 83 | † | -3.4 | -1.3 | 2.8 |
| 8. Madagascar | 70 | -3.6 | -6.3 | 0.1 | 2.4 |
| 9. Malawi | 30 | -22.1 | -3.3 | -8.8 | -3.9 |
| 10. Mali | 54 | -10.7 | 1.6 | -1.1 | -0.7 |
| 11. Mozambique | 56 | -59.9 | -9.6 | 1.1 | 2.0 |
| 12. Niger | 15 | -13.5 | 1.1 | 4.7 | 3.4 |
| 13. Nigeria | 32 | 18.3 | 9.8 | † | † |
| 14. Rwanda | 27 | -15.2 | -4.4 | -1.4 | 3.5 |
| 15. Senegal | 65 | † | 1.3 | 1.4 | 4.2 |
| 16. South Africa | 14 | -19.9 | -3.4 | † | † |
| 17. Tanzania | 57 | -5.7 | -10.2 | 1.9 | 1.5 |
| 18. Togo | 43 | -19.8 | -5.9 | -3.1 | -0.9 |
| 19. Uganda | 70 | -1.6 | -7.9 | -1.8 | 3.1 |
| 20. Zambia | 20 | -15.6 | -13.3 | -6.5 | 6.5 |
| Observations | **917** | 231 | 239 | 221 | 226 |
| Average ROA | | **-9.9** | **-2.9** | **-0.2** | **1.6** |
| Median ROA | | **-6.9** | **-3.4** | **0.1** | **1.9** |

**NOTES**: Table 4 reports the results of the methodical relationship between Return on Assets (ROA) and different loan sizes (depth of outreach) for 107 MFIs operating in SSA during the period 1998 to 2012. The symbol (†) indicates no observations were available for that particular segment. The **USD** abbreviates United States dollars and **Obs**. refers to number of observations.

# TABLE 5

## METHODICAL ANALYSIS OF THE RELATIONSHIP BETWEEN CLIENT OUTREACH AND THE FINANCIAL PERFORMANCE OF MFIs IN SSA OVER THE PERIOD 1998 - 2012

| COUNTRY | Obs. | LEVELS OF CLIENT OUTREACH | | |
| --- | --- | --- | --- | --- |
| | | SMALL | MEDIUM | LARGE |
| 1. Benin | 63 | -5.2 | -0.4 | -0.4 |
| 2. Burkina Faso | 20 | -1.6 | -1.9 | 1.3 |
| 3. Cameroon | 22 | 4.1 | 0.6 | -3.3 |
| 4. Congo, DR | 26 | -6.7 | -0.2 | 5.9 |
| 5. Ethiopia | 79 | 0.3 | 2.3 | 5.0 |
| 6. Ghana | 71 | -5.8 | -0.6 | 3.4 |
| 7. Kenya | 83 | -3.8 | -4.4 | 2.4 |
| 8. Madagascar | 70 | -0.1 | -0.7 | 5.5 |
| 9. Malawi | 30 | -31.0 | -17.3 | -1.5 |
| 10. Mali | 54 | -9.8 | -2.9 | 0.6 |
| 11. Mozambique | 56 | -11.3 | 0.7 | 6.2 |
| 12. Niger | 15 | 3.6 | † | -4.3 |
| 13. Nigeria | 32 | 28.9 | 7.9 | 10.5 |
| 14. Rwanda | 27 | -3.4 | -9.3 | -4.6 |
| 15. Senegal | 65 | -1.0 | 4.6 | 3.5 |
| 16. South Africa | 14 | -18.0 | -15.1 | -3.1 |
| 17. Tanzania | 57 | -14.4 | -4.6 | -1.7 |
| 18. Togo | 43 | -6.0 | 1.3 | 1.7 |
| 19. Uganda | 70 | -32.1 | 0.6 | 1.5 |
| 20. Zambia | 20 | -14.2 | -6.2 | † |
| Observations | **917** | 364 | 287 | 266 |
| Average ROA | | **-6.4** | **-2.4** | **1.5** |
| Median ROA | | **-5.5** | **-0.6** | **1.5** |

**NOTES**: Table 5 presents the methodical relationship between Return on Assets (ROA) and different levels of client outreach (breadth) of 107 MFIs operating in SSA over the period 1998 to 2012. The symbol (†) indicates no observations were available for that particular segment, and **Obs**. refers to the number of observations. The breadth of outreach is characterised as (I) **Small Outreach**: MFIs with fewer than 10,000 clients; (II) **Medium Outreach**: MFIs with between 10,000 and 30,000 clients; and (III) **Large Outreach**: MFIs with more than 30,000 clients.

# TECHNICAL APPENDEX

## TABLE A1
### COUNTRIES IN THE SAMPLE

| | |
|---|---|
| 1. Angola | 20. Madagascar |
| 2. Benin | 21. Malawi |
| 3. Burkina Faso | 22. Mali |
| 4. Burundi | 23. Mozambique |
| 5. Cameroon | 24. Namibia |
| 6. CAR | 25. Niger |
| 7. Chad | 26. Nigeria |
| 8. Comoros | 27. Rwanda |
| 9. Congo, DR | 28. Senegal |
| 10. Congo, Rep. | 29. Sierra Leone |
| 11. Cote d'Ivoire | 30. South Africa |
| 12. Ethiopia | 31. South Sudan |
| 13. Gabon | 32. Swaziland |
| 14. Gambia, The | 33. Tanzania |
| 15. Ghana | 34. Togo |
| 16. Guinea | 35. Uganda |
| 17. Guinea-Bissau | 36. Zambia |
| 19. Kenya | 37. Zimbabwe |
| 19. Liberia | |

**NOTES**: Table A1 lists the 37 countries of the SSA region in our sample. The acronym CAR abbreviates the Central Africa Republic.

## TABLE A2
### DEFINITION OF VARIABLES

| VARIABLE | MEASUREMENT |
|---|---|
| Breadth of Outreach | Number of clients served by MFI |
| Depth of Outreach | Gross Loan/Total number of borrowers  (Average Loan Size) |
| Credit Risk | Portfolio at Risk (PAR) captured as: overdue loans >90days/GLP |
| Firm Size | Total Gross Loan Portfolio |
| Return on Assets (ROA) | Net Profit/Total Assets |

20

**TABLE A3**
**DESCRIPTIVE STATISTICS**

| VARIABLE | N | MEAN | S.D | MIN | p25 | MEDIAN (p50) | p75 | MAX |
|---|---|---|---|---|---|---|---|---|
| Breadth of Outreach ('000) | 1499 | 27.3 | 79.2 | 0.1 | 5.785 | 7.5 | 36.47 | 1450 |
| Depth of Outreach ('000) | 1499 | 0.58 | 1.10 | 0.01 | 0.12 | 0.25 | 0.600 | 22.3 |
| Credit Risk (%) | 1499 | 0.09 | 0.13 | 0.0 | 0.01 | 0.05 | 0.07 | 1.79 |
| Firm Size (millions of USD) | 1499 | 15.90 | 96.7 | 0.002 | 0.295 | 1.590 | 1.13 | 2530 |
| Return on Assets (%) | 1499 | -0.02 | 0.14 | -0.92 | -0.04 | 0.01 | 0.04 | 1.01 |

**NOTES**: Table A3 presents the summary statistics for the dependent and explanatory variables. The data covers the period 1998 to 2012 and incorporates 479 MFIs drawn from 37 countries of SSA. See Table A2 for the description of variables.