

Sustainability and Outreach in the Microfinance Sector of Ghana

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The recent finance sector clean-up in Ghana led to the collapse of a number of microfinance institutions (MFIS), which reignited the discussion of whether MFIS can achieve much-needed financial sustainability while also meeting the goal of reaching out to the poor. In that regard, this paper explores the potential for MFIS to improve the breadth of outreach by fostering financial inclusion and to deepen the depth of outreach by targeting the poor while simultaneously pursuing self-sufficiency and profitability. Using data from the MIX database for 89 MFIS over a 20-year period, we employed fixed and random effects models to show that among other results, outreach is improved when MFIS are financed more by debt than equity and that the pursuit of profitability is a disincentive to outreach. Overall, the results suggest that with improved efficiency in the pursuit of sustainability, MFIS in Ghana stand better chances of achieving outreach both in depth and breadth.

Key Words: microfinance institutions, outreach, profitability, sustainability

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Introduction

‘Microfinance’ is often used to refer to microcredit even though the term is broader and includes the general provision of financial services to the financially excluded who often intersect with the poorest in society (Ledgerwood 1998). Due to its promise to be a tool that will correct market failure by more efficiently allocating capital and expanding opportunities to the poor, it has been employed historically across the globe (Cull, Demirgüç-Kunt, and Morduch 2011a; 2011b). Over the years, its us-

age has moved from merely providing financial services, to serving as a financial intermediary and even social intermediation. Social intermediation is defined as the building of both human resources and institutional capacities with the objective of improving self-reliance among marginalized groups and hence preparing them to engage in formal financial intermediation (Hinson 2011; Edgcomb 1998). Social intermediation comes in many forms, including capacity building through various financial training on bookkeeping and business management, and even networking (Wairimu and Mwilaria 2017).

The assorted roles that microfinance plays in this regard ensures its relevance as a tool for development (Ledgerwood 1998). However, as a tool it has not been without criticism regarding its continued relevance in the ever-evolving development climate. A study in Nigeria by Kasali, Ahmad, and Ean (2015) found that in order for microfinance institutions (MFIs) to have a significant effect on poverty, efforts had to be supplemented by the government through the provision of infrastructural and social facilities. Given the structural similarities, this would not be any different in the context of Ghana. In other studies, access to microfinance was observed to lead to increasing levels of indebtedness in deprived communities and hence worsened vulnerabilities (Banerjee and Jackson 2017). Microfinance by itself is not the bane of poverty. This point is further illustrated in the study by Agbeko et al. (2016) where loan repayment rates were considerably better amongst entrepreneurs with more than fifteen years of experience in business.

Essentially, the fundamental question at hand, taken in the context of Ghana and, by extension, all developing nations, is whether the role played by microfinance significantly impacts the living situation of the poor in measurable social and economic dimensions. In tackling this question, we unavoidably encounter the inherent issue of long run financial sustainability and whether the pursuit of it comes at a detriment to outreach, thus posing a trade-off between MFI sustainability and outreach. Financial sustainability in this context is described as the ability of an entity to cover its costs internally without the need to depend on external support (Kinde 2012).

The initial adoption of microfinance and its subsequent development in Ghana was to improve the degree of financial inclusion of the poor and those mainly in the agricultural sector. Given that the economic dimension of poverty vis-à-vis consumption and income is rather rampant in the agricultural sector which also accounts for majority of the poor

population, it becomes incumbent to examine the performance of MFIS in the country to ascertain whether or not they are reaching the original goal of improving financial inclusion. The role of MFIS cannot be underestimated if they are to be seen as a major tool for combatting poverty and unemployment among the poorest in the Ghanaian communities. This is relevant as substantial reduction in poverty has been attributed to access to finance (Littlefield, Morduch, and Hashemi 2003; McIntosh, Villaran, and Wydick 2011), considering that the impact of microfinance is expected to go beyond business loans and extend into home, health, and education investment as well as the servicing of other cash needs for the poor. In this sense, MFIS become the very institutions that possess the ability to provide capital to small, micro, and medium enterprises to reach their production potential such that the trend of increasing unemployment and deepening poverty may be halted in the long run.

Yet, there have been some criticisms that microfinance does not necessarily reach the poorest populations and that there are times when the poorest of the poor are intentionally excluded from the programmes of microfinance (Scully 2004; Simanowitz 2002). Such exclusion is generally because of the dual problem of the poorest of the poor being (1) typically extremely risk averse such that they do not have the propensity to borrow for any investment ventures, and (2) being designated as bad credit risks which results in MFIS fearing to lend to them as they consider such lending to be too risky (Marr 2003; Hulme and Mosley 1996). The failure of MFIS to reach out to the poor by reason of improving their own financial performance therefore becomes detrimental to the goal of outreach and affects overall macroeconomic stability. By extension, the very purpose of correcting market failure by more efficiently allocating capital and expanding opportunities to the poor and vulnerable becomes defeated. It is no wonder that Marr (2003) argues that MFIS have failed on two accounts, the first being that they have not been able to solve the information asymmetry problem that exists between borrowers and lenders. This failure is visible among the Ghanaian poor as they generally consider credit unattainable without receiving proper or accurate information about credit worthiness. The second failure is that MFIS have excluded the poor and in the process created more poverty by their pursuit of sustainability.

Admittedly, the operations of MFIS are costly due to the associated high transactional and informational costs. This reignites the contention between the *poverty lending* approach and the *financial systems* approach

described by Robinson (2001). While the *financial systems* approach focuses on reduction of operational costs and the ability of MFIS to cover their cost of lending by the income generated from their loan portfolios, the *poverty lending* approach places emphasis on the provision of credit with reduced interest rates in an effort to reduce poverty. Given the high cost of MFI operations, it follows that focusing on sustainability inhibits the goal of reaching out to the poorest of the poor in large numbers, thus creating a trade-off between sustainability and outreach.

Considering that focusing on lending to the poor can be costly for MFIS, whereas focusing on sustainability comes at the detriment of the poor, sustainability and outreach therefore become conflicting goals with the pursuit of one affecting the other negatively (Hermes and Lensink 2011). Against the backdrop of that assertion, this paper aims to examine the relationship between the financial performance of MFIS and their capacity to reach out to the poor amongst Ghana's population. We explore whether sustainability and profitability can be pursued at the same time as outreach. The contribution of this paper is twofold. First, using multiple sustainability variables, we provide deeper insights into the real effects of sustainability measures on MFI outreach in Ghana. Secondly, we uniquely incorporate percentage of female borrowers as a measure of depth of outreach and also provide evidence that the financial performance of MFIS in Ghana directly impacts their ability to reach out to the poorest of the poor and that MFI profitability pursuits are a disincentive to outreach.

The remaining sections of this paper are structured as follows: First, a review of literature is presented in the second section to capture an overview of existing studies and highlight the need for financial sustainability of MFIS. Materials and methods used are then presented in the third section, while the empirical results and discussion of results are presented in the fourth section. The conclusion then follows in the fifth section.

Literature Review

THE NEED FOR FINANCIAL SUSTAINABILITY

The underlying argument for sustainability is the capacity of an MFI to maintain a form of consistency in performance. This does not imply that an MFI's performance is unchanging but rather borders on its reliability to continue operations into the foreseeable future. Schreiner (2000) aptly

describes the concept as the permanence of MFIS. In this sense, MFIS, in meeting their current goals, do not jeopardize future prospects. It is worth noting that an unsustainable MFI will be unable to meet the needs of the poor in the future, hence making no contribution to poverty reduction or development as intended. A reduction in future prospects is not the only risk an unsustainable MFI faces, as even in the present, such an institution is not likely to meet the goal of reaching out to the poor (Adams, Graham, and von Piske 1984) and creates a further risk of having detrimental effects on the targeted client base (Krahnen and Schmidt 1994).

The financial performance of an MFI, while not the only important characteristic, can easily be the most influential when it comes to the sustainability of an MFI. Kinde (2012) defines financial sustainability as the ability of an entity to cover its costs internally without the need to depend on external support. We adopt this definition for the purpose of this study. However, given that this definition does not focus on the status of the MFI either as profit seeking or otherwise, this study equally does not intend to place emphasis on the status of MFIS when referring to their financial sustainability.

SUSTAINABILITY AND OUTREACH: CHALLENGES

Sustainability and outreach in microfinance studies are often viewed as trade-offs, with the pursuit of one coming at the expense of the other. The common hypothesis is that when MFIS focus on financial sustainability, they move away from their unique purpose of serving the poor who often happen to be the same group that are financially excluded (Ek 2011). A few studies have, however, pointed to the complementary nature of the two (Rhyne 1998) and there is even the assumption that sustainable MFIS can be profitable enough to continue their coverage to the poor even when donor funding discontinues.

This premise leads us to the biggest bone of contention in microfinance studies: whether an MFI that aspires to financial sustainability does so to the detriment of their original objective of reaching out to the poor or financially excluded, a concept generally referred to as 'Mission Drift.' The term is often used to denote when an organization moves away from objectives as stated or specified in their mission statement. In relation to microfinance, we will shortly explore this term as a challenge for financial sustainability. MFIS, whether for profit or not, while they may achieve financial sustainability, still contrast with traditional financial institutions

in four main ways: in ownership, the calibre of clients they target or serve, products and services offered, and finally in the methodologies adopted in lending (Visconti 2016). Another challenge therefore arises: how regulation of MFIS should differ from that of traditional institutions. The two preceding challenges are further explored below.

Mission Drift

Mission drift occurs when an MFI's average loan size increases because of a shift in the composition of its targeted clients (Engels 2009). In the pursuit of financial sustainability there is a general consensus that the process will lead to MFIS targeting less and less of the intended client base. In academic literature, mission drift is observed when MFIS have a larger average loan size or reduced proportion of female borrowers (or other excluded groups) within their portfolios, in turn leading to less access to MFIS, referred to as lower depth of outreach. This is in line with the analysis conducted by Hermes, Lensink, and Meesters (2008), who found that MFIS that have lower average loan balances and more women borrowers are less efficient.

Regulation of MFIS

Given that the services of MFIS are not confined to credit but also involve savings, insurance, and transfer facilities, effective regulation and supervision are core components for MFIS to strategize to attain financial sustainability (Gallardo 2002). This is especially the case if MFIS are to meet the demands of offering financial services to the most deprived. MFI funds are often inadequate to meet their credit demands. MFIS augment lending from private savings from their customer base and institutional savings from other financial institutions. Others can fund lending through securities issued from capital markets; this is, however, an uncommon option for MFIS in developing country economies. Whatever the choice of funding, it is vital that MFIS safeguard the funds of investors, and one way to ensure this is through their compliance with carefully thought-out laws and regulations. The benefit of this is the creation of a virtuous circle where MFIS are further able to access additional funds and reach their goals.

In regulating the operations of MFIS, another question is raised. Should laws be designed specifically for the microfinance sub-sector or incorporated in overall banking regulations (Pouchous 2012)? The second point for consideration is that compliance with regulation could lead to mission

drift. Various academic studies have tried to document the relationship between regulation and mission drift. Quartey and Kotey (2019) found a positive relationship between regulation and the breadth of outreach (measured by the number of active clients). According to the study, the relationship is most likely enhanced by the increased confidence clients have in well-regulated MFIS. Increased confidence means higher voluntary deposits which MFIS harness to raise funding. The same study, however, found no conclusive relationship between regulation and the depth of outreach when the proxy used was the average loan size. When the depth of outreach was measured by the percentage of female clients it proved a negative relationship with regulation.

Cull, Demirgüç-Kunt, and Morduch (2011a) observed different results in profit-oriented MFIS. These institutions have to comply with strict supervision due to their for-profit statuses. As a result, they tend to limit their operations away from segments of the population that are more expensive to serve (particularly women and the poor). This generally follows the broad conception that compliance with regulation is expensive and additional expenses are not welcome in for-profit institutions. Not-for-profit MFIS tell a different story, as they generally do not adjust their operations in response to regulation.

CHALLENGES FOR FINANCIAL SUSTAINABILITY IN GHANA

MFIS in Ghana face a number of challenges that serve as a barrier to their sustainability. Notable among them is the changing environment in which they operate. According to the contingency theory posited by Frese (2007), the ability of an organization to be successful is largely dependent on its deliberate actions to adapt to its environment. In relation, an MFI should be organized in such a way as to fit both its internal and external conditions. Following this premise, we can conclude that there is no right way to effectively organize MFIS to ensure sustainability. The success of an MFI is largely dependent on its ability to adapt to both the organizational and external environment. However, in the case of Ghana, there is the added complexity of rapid changes in the external environment within which MFIS operate. According to Mensah and Peprah (2018), this then suggests that institutional frameworks, regulations, supervision, co-ordination, data information and dissemination, capacity building and funding, and credit delivery management, which are important for the proper functioning of the microfinance industry, can also act as barriers to the success and sustainability of MFIS. This

point is further reinforced by Boateng (2015) who, in his study of the prospects and challenges facing MFIS in Ghana, discovered that irregular and constant changes in government policies and regulatory environment was one of the impediments to the growth and sustainability of MFIS.

Another prominent challenge to the sustainability of MFIS in Ghana is the level of capacity building and funding. In their study of the contemporary challenges facing MFIS in Ghana, Mensah and Peprah (2018) studied the relationship between capacity building and funding challenges and the sustainability of MFIS and established a negative significant relationship. This result is consistent with theory where low staff capacity as well as funding is detrimental to the sustainability of MFIS. Boateng and Agyei (2013) also affirm this relationship in their studies by showing that sampled MFIS that had funding challenges found it difficult to chalk continuous successes. For the authors, this is because such MFIS found it difficult to meet internal costs related to sustainable technology and transport to maintain their sustained continuity into the foreseeable future.

OUTREACH AS AN ASPECT OF SOCIAL PERFORMANCE

MFIS also benefit from increased outreach. MFIS that reach out to a large number of people increase their chances for achieving long-term sustainability and economies of scale (Rashem and Abdullah 2018). Outreach is the breadth and depth of the financial services provided by MFIS (Rao and Fitamo 2015). Gebrehiwot and Chawla (2016) define outreach alternatively as the ability of MFIS to provide financial services to a large proportion of the society, most especially the poorest of the poor. Two aspects arise from these definitions of outreach: depth and breadth. Depth of outreach involves inclusion of the poorest of the poor whilst breadth refers to extension of MFI services to a wider client base (Conning 1999). Schreiner (2002) and Navajas et al. (2000) extend their definitions to include worth of outreach to clients, cost of outreach to clients, length of outreach, and scope of outreach. This paper, however, focuses on only the breadth and depth of outreach.

FINDINGS FROM PREVIOUS STUDIES

Findings from studies focusing on the relationship between sustainability and its related variables and MFI outreach have been varied. In some studies we find some degree of complementarity between these vari-

ables and outreach (Nurmakhanova, Kretzschmar, and Fedhila 2015). Kattilakoski (2018) found that in MFIs in Sub-Saharan Africa, there was some trade-off between efficiency and outreach, but not a large one. Further results from the same study showed operationally self-sufficient MFIs having higher levels of outreach compared to non-self-sufficient ones. In other studies, both complementary and opposing relationships were found. Awaworyi (2020) found, through studying 1,595 MFIs in 109 countries, a trade-off between financial sustainability and depth of outreach but that sustainability reinforces breadth of outreach. Employing interest and default rates as transmission mechanisms in the study of 32 MFIs in India, MFIs were found to simultaneously attain both financial sustainability and their social mission (Sim and Prabhu 2014). An argument for such complementarity can be seen in the premise that repayment of credit, which spurs further outreach, is dependent on MFI sustainability.

In analysing microfinance impact, we see various studies asserting that microfinance raises consumption expenditure while others conclude that microfinance is more beneficial for those that are extremely poor as opposed to those that are only moderately poor (Pitt and Khandker 1998; Khandker 2005). Roodman and Morduch (2014), however, refute the foregoing results on the basis of the use of a robust linear estimator or eliminating outliers in the data. In analysing the effect of microfinance, we also see the results of randomized evaluation from authors such as Banerjee et al. (2015), who had mixed impact results with microfinance leading to increase in profits for pre-existing businesses while consumption did not increase. They also found no major changes in health or social improvements such as women's empowerment.

Other studies have implied reverse causality between financial performance and depth of outreach (Quayes 2012). In addition, depth of outreach has a positive relationship with financial sustainability and firms that are operationally self-sufficient have a smaller average loan size compared to firms that are not operationally self-sufficient. We also observe in the study of Schäfer and Fukasawa (2011) that the higher the breadth of outreach, the more the MFI can take advantage of economies of scale and scope, thus reducing the cost per borrower.

Based on these mixed results, it is clear that the results of one study or experiment can hardly be effectively generalized (Hermes and Lensink 2011). The fact that one microfinance experiment or analysis yields positive results in Asia does not necessarily mean the same results will be

achieved in South America or Africa. There are country-specific and continental differences that affect the operation of and access to microfinance. These dynamics make it necessary to evaluate microfinance performance and impact on a case-by-case basis and only then can reasonable comparisons be drawn.

Materials and Methodology

DATA AND VARIABLES

The main data for this study are derived from the Microfinance Information Exchange Market database (MIX). The MIX dataset, which is now freely available via the World Bank database, offers a wide-ranging collection of data on financial performance throughout the world and can be considered reliable as it goes through a process of auditing by MIX prior to being released publicly (Bassem 2012; Awaworyi and Marr 2014).

We use a sample of unbalanced panel data comprising of 89 MFIS in Ghana, ranging from 1999 to 2018, thus making for a 20-year period.

Dependent Variables

Outreach is sub-categorized into two aspects – depth and breadth. For measuring the depth of outreach, several authors use as proxies the average value of loans or the average value of loans as a percentage of GNP/capita (Hoepner, Liu, and Spaggiari 2011; Gebrehiwot and Chawla 2016; Awaworyi 2020). Given that the study analyses the outreach of MFIS in the same country, we use the variable ‘Average loan balance per borrower’ which directly matches the average value of loans as proxy for depth of outreach. We simply refer to this variable as ALBPB. We employ this variable with the understanding that depth of outreach is oftentimes greater when the loan size is smaller (Hossain et al. 2020).

Women in developing countries often lack vital sureties such as land or housing which can act as collaterals for loan accessibility, thus placing them at a certain disadvantage when it comes to credit access. This attests to the female vulnerability to poverty as described by Bhatt and Tang (2005). Against this backdrop, we fittingly employ ‘Percentage of female borrowers’ (PFB) as another proxy for depth of outreach to reflect a segment of the deprived population (Nwachukwu et al. 2018). The use of this variable is vital in this study as it is reported that although women play an important role in Ghanaian agriculture, they experience productivity constraints due to the lack of or limited access to credits and land (Gbedemah, Jones, and Perezniето 2010).

TABLE 1 List of Dependent Variables

| Acronym | Name | Measures |
|---------|---|---------------------|
| ALBPB | Average Loan Balance per Borrower | Depth of outreach |
| PFB | Percentage of Female Borrowers | Depth of outreach |
| NACB | Number of Active Borrowers | Breadth of outreach |
| NDVTD | Number of Depositors of Voluntary Time Deposits | Breadth of outreach |

To measure the breadth of outreach, we employ the number of active clients as a proxy as it accounts for the total number of clients with access to the financial services of MFIS (Rosenberg 2009). To accurately represent this proxy, we use the ‘Number of active borrowers’ (NACB) variable as a relevant measure of breadth of outreach with the understanding that it is better to report active borrowers than total borrowers, which may include dormant clients/accounts, thus avoiding bias.

Additionally, we use the ‘Number of depositors of voluntary time deposits’ (NDVTD) as a second measure of breadth of outreach as it accounts for the number of clients with access to the non-credit services or facilities of MFIS, thus offering a better overview of the number of depositors who do not necessarily have the need for credit with the particular MFIS.

We thus use ‘Average loan balance per borrower’ (ALBPB) and ‘Percentage of female borrowers’ (PFB) as proxies for depth of outreach, while we use ‘Number of active borrowers’ (NACB) and ‘Number of depositors of voluntary time deposits’ (NDVTD) as proxies for breadth of outreach. These four variables are the dependent or response variables for the study. The detailed list of dependent variables is in table 1.

Independent Variables

The independent or explanatory variables employed in this study for measuring MFIS’ financial sustainability and performance are systematically grouped into categories on the basis of financial ratios such as (see table 2):

1. Degree of efficiency of the MFIS,
2. Profitability degree of the MFIS,
3. MFIS’ liquidity and risk, and
4. MFIS’ capital structure.

Degree of Efficiency of the MFIS. For the ‘Degree of efficiency of the MFIS,’ we identify ‘Cost per borrower’ (CPB) as a proxy. Cost per borrower (CPB)

TABLE 2 List of Independent Variables

| Measures | Acronym | Name |
|---------------------------------|---------|------------------------------------|
| Degree of efficiency of MFIS | CPB | Cost per borrower |
| | OEXTA | Operating expense/total assets |
| | IED | Interest expense on deposit |
| | PFLO | Percentage of female loan officers |
| | GLP | Gross Loan Portfolio |
| Degree of profitability of MFIS | ROA | Return on Assets |
| | ROE | Return on Equity |
| | OSS | Operational Self Sufficiency |
| MFIS' liquidity and risk | PR30 | Portfolio at Risk by 30 days |
| | LLR | Loan Loss Rate |
| MFIS' capital structure | DER | Debt to Equity Ratio |

is measured as the operating expense divided by the average number of active borrowers and the unit of measurement is in USD. It is expected that an MFI with a higher CPB will essentially have lower financial sustainability (Awaworyi and Marr 2014) but also be positively correlated with the MFI's outreach (Kar 2010).

Similarly, we use the 'Operating expense/total assets' (OEXTA) as a cost efficiency ratio to provide a measure of the costs incurred by an MFI from the operation of its assets. In that regard, we expect that an efficient MFI will have lower OEXTA. We also consider the 'Interest expense on deposit' (IED) variable as an efficiency measure with the expectation that a sustainability-oriented MFI will balance its costs related to deposit accounts to attain an optimum level of efficiency.

Acknowledging that an MFI focusing on female borrowers would employ a significant number of female loan officers (International Labour Office 2007), we also uniquely incorporate the 'Percentage of female loan officers' (PFLO) as another variable when considering efficiency in the Ghanaian cultural setting. Given that an efficient MFI will attempt to keep the delinquent components of their growing portfolios to a minimum, we also include the 'Gross Loan Portfolio' (GLP) variable as an efficiency measure.

Degree of Profitability of the MFIS. We also select 'Return on Assets' (ROA), 'Return on Equity' (ROE), and 'Operational Self Sufficiency' (OSS) as proxies for 'Degree of profitability of the MFIS.' An MFI having its

OSS greater than 100% is considered profitable. The usage of ROE and ROA as measures for profitability is common among financial institutions as highlighted by Rosenberg (2009). While we use both ROE and ROA ratios in our models, we avoid using them simultaneously in the same model to eliminate the risk of multicollinearity.

MFI's Liquidity and Risk. As proxies for liquidity and risk, we select the 'Portfolio at Risk by 30 days' (PR30) and the 'Loan Loss Rate' (LLR) variables to account for their effects on the sustainability of MFIS. By definition, PR30 measures how MFIS are able to effectively make collections on their repayment (Tehulu 2013) and can practically be considered as the value of any loans for which the instalment or outstanding amount has not been paid past 30 days. We use 30 days as a standard given that the longer the loan remains unpaid, the higher the risk of defaulting.

The MFI's Capital Structure. 'Debt to Equity Ratio' (DER) is employed as a proxy for the capital structure of an MFI and is measured by dividing total liability by total equity. We employ this ratio to highlight the degree to which an MFI's operations are funded by debt as opposed to equity. The DER has been found to have a positive impact on an MFI's ROA, thus suggesting profitability (Abrar and Javaid 2016).

DESCRIPTIVE STATISTICS AND CORRELATION ANALYSIS

Table 3 is an overview of the summary statistics, which generally describes the character of the data sample used for all regressors and response variables. A major highlight of the descriptive statistics show that Ghanaian MFIS are barely able to cover their operational costs with an average of 1.144 observed for OSS. This number represents a struggling MFI sector and that is notably a worrying trend. With a wide range between the minimum and maximum values, the mean ROE and ROA values are rather low at 0.158 and 0.007, respectively. From the onset, one can already deduce a general level of unprofitability in the MFI sector of Ghana. It is also noteworthy to mention that the average number of female borrowers is only 0.708%, suggesting a general lack of focus on the female borrower population.

Table 4 presents the correlation analysis conducted for the independent variables employed in the study. The output offers a visualization of the patterns in the data for all regressors under consideration. It can be observed that ROE and DER have a strong negative correlation while ROA and OSS have a strong positive correlation. Additionally, GLP and

TABLE 3 Summary Statistics

| Variable | Obs | Mean | Std. dev. | Min | Max |
|----------|-----|---------------------|---------------------|---------|----------------------|
| ALBPB | 298 | 604.309 | 1430.688 | 1 | 15471 |
| PFB | 236 | 0.708 | 0.314 | 0.058 | 4 |
| NACB | 307 | 13653.42 | 25435.798 | 20 | 148020 |
| NDVTD | 41 | 1621.854 | 3265.912 | 0 | 16087 |
| CPB | 174 | 224.54 | 391.112 | 5 | 2697 |
| OEXTA | 209 | 0.244 | 0.153 | 0.018 | 0.908 |
| IED | 242 | 1.901e ⁸ | 2.943e ⁹ | 0 | 4.578e ¹⁰ |
| PFLO | 64 | 0.345 | 0.278 | 0 | 1 |
| GLP | 349 | 9764383.1 | 44667507 | 0 | 5.010e ⁸ |
| ROA | 209 | 0.007 | 0.113 | -0.594 | 0.48 |
| ROE | 209 | 0.158 | 232.891 | -1651 | 2726.667 |
| OSS | 297 | 1.144 | 0.43 | 0.085 | 4.49 |
| PR30 | 232 | 0.1 | 0.107 | 0 | 0.744 |
| LLR | 191 | 0.384 | 3.295 | -0.024 | 40.268 |
| DER | 298 | 5.634 | 45.216 | -354.28 | 558.62 |

TABLE 4 Correlation Matrix

| Variables | OSS | OEXTA | ROE | ROA | PR30 | LLR | CPB | IED | GLP | PFLO | DER |
|-----------|---------|---------|---------|---------|--------|---------|--------|--------|--------|--------|-------|
| OSS | 1.000 | | | | | | | | | | |
| OEXTA | -0.468* | 1.000 | | | | | | | | | |
| ROE | 0.339* | -0.628* | 1.000 | | | | | | | | |
| ROA | 0.869* | -0.659* | 0.719* | 1.000 | | | | | | | |
| PR30 | -0.124* | 0.096 | 0.047 | -0.136* | 1.000 | | | | | | |
| LLR | -0.113 | -0.024 | 0.074* | -0.129 | 0.421* | 1.000 | | | | | |
| CPB | -0.207* | 0.351* | 0.089* | -0.151 | 0.798* | 0.421* | 1.000 | | | | |
| IED | -0.183* | 0.064 | 0.121 | -0.120* | 0.223* | 0.018* | 0.231 | 1.000 | | | |
| GLP | -0.199* | 0.241* | 0.151* | -0.127 | 0.091 | -0.025 | 0.226 | 0.774* | 1.000 | | |
| PFLO | 0.008 | -0.469* | 0.250* | 0.132* | 0.133 | 0.139 | -0.122 | 0.145* | 0.010* | 1.000 | |
| DER | -0.340* | 0.640* | -0.997* | -0.717* | -0.072 | -0.102* | -0.109 | -0.111 | -0.136 | -0.272 | 1.000 |

NOTES * Significant at 0.05.

PFLO exhibit a weak positive relationship similar to IED and LLR. The other observed correlation figures presented are fairly standard.

ECONOMETRIC MODELLING

Econometric modelling in the field of microfinance has employed a host of techniques, with the most common techniques being the fixed effects

(FE) or random effects (RE) estimation of panel data (Abdulai and Tewari 2017; Mersland and Strøm 2014; Janda and Turbat 2013; Kar 2010). While FE is ideal when estimating impacts of variables that have varying degree in time with individual effects assumed to be correlated to the regressor, RE assumes a random variation across entities with no correlation with the regressors in the model (Torres-Reyna 2007).

In this study, we employ both fixed and random effects for the purpose of robustness. We then use the Hausman specification test to identify the most preferred model which is consistent and suitable for onward discussion. Using Fixed Effects (FE) and Random Effects (RE) models, we estimate two models for depth of outreach as follows:

$$\begin{aligned} \text{ALPB}_i &= \alpha_0 + \alpha_1\text{OEXTA}_i + \alpha_2\text{ROE}_i + \alpha_3\text{CPB}_i + \alpha_4\text{PR3O}_i \\ &+ \alpha_5\text{LLR}_i + \alpha_6\text{DER}_i + u_{it} + v_{it}, \end{aligned} \tag{1}$$

$$\begin{aligned} \text{PFB}_i &= \alpha_0 + \alpha_1\text{OEXTA}_i + \alpha_2\text{CPB}_i + \alpha_3\text{LLR}_i + \alpha_4\text{PFLO}_i \\ &+ u_{it} + v_{it}, \end{aligned} \tag{2}$$

where α_0 is the constant and u_{it} and v_{it} represent the Between MFI error and Within MFI error, respectively. Additionally, $\alpha_1 \dots \alpha_6$ are coefficients to be estimated, with OEXTA_i , ROE_i , CPB_i , PR3O_i , LLR_i , DER_i , and PFLO_i being vectors of the independent variables.

Similar to equations (1) and (2), we model two equations for the breadth of outreach as follows:

$$\begin{aligned} \text{NACB}_i &= \alpha_0 + \alpha_1\text{ROA}_i + \alpha_2\text{PR3O}_i + \alpha_3\text{LLR}_i + \alpha_4\text{GLP}_i \\ &+ \alpha_5\text{CPB}_i + \alpha_6\text{OSS}_i + u_{it} + v_{it}, \end{aligned} \tag{3}$$

$$\text{NDVTD}_i = \alpha_0 + \alpha_1\text{OEXTA}_i + \alpha_2\text{IED}_i + \alpha_3\text{ROA}_i + u_{it} + v_{it}, \tag{4}$$

where α_0 is the constant and u_{it} and v_{it} for equations (3) and (4) also represent the Between MFI error and Within MFI error, respectively. Further, $\alpha_1 \dots \alpha_6$ are coefficients to be estimated, with ROA_i , PR3O_i , LLR_i , GLP_i , CPB_i , OSS_i , OEXTA_i , and IED_i also as vectors of the independent variables.

Empirical Results and Discussion

The results of the Hausman specification test in table 5 present a *P*-value that is greater than 0.05 for all four models. Consequently, we do not reject the null hypotheses. By this standard, the random effects models are preferred as they offer more consistent and efficient estimators of the true population parameters.

TABLE 5 Hausman Test for Models

| Item | Model 1 | Model 2 | Model 3 | Model 4 |
|-----------------------|---------|---------|---------|---------|
| Chi-square test value | 9.26 | 3.106 | 7.712 | 0.835 |
| <i>P</i> -value | 0.099 | 0.54 | 0.173 | 0.659 |

**DEPTH OF OUTREACH: AVERAGE LOAN BALANCE PER
BORROWER (ALBPB)**

From both FE and RE model 1 (table 5), the variables OEXTA, CPB, LLR, and DER are statistically significant, while ROE and PR30 do not achieve any statistical significance. Additionally, the variable coefficients have consistent signs in both models. However, given the results of the Hausman specification test (table 5) with *p*-value being 0.099 and Prob > Chi-Square greater than the level of significance (0.05), we do not reject the null hypothesis. Consequently, RE model 1 (table 6) is the more consistent and appropriate model and will be the basis for onward discussion.

Based on the output of RE model 1, the ratio of operating expenses to the total assets (OEXTA) is statistically significant at 1% and has a negative coefficient. This implies an inverse correlation with the average loan balance per borrower (ALBPB), thus suggesting that an increase in the operating expenses reduces the average loan balance per borrower in

TABLE 6 Model 1 – Average Loan Balance per Borrower (ALBPB)

| Variable | FE | RE |
|--------------|-------------------------|---------------------------|
| Constant | 127.562** (54.748) | 155.45*** (45.317) |
| OEXTA | -396.365** (174.063) | -432.724*** (147.16) |
| ROE | -0.432 (0.339) | -0.523 (0.318) |
| CPB | 2.401*** (0.224) | 2.337*** (0.13) |
| PR30 | -94.697 (269.139) | -176.032 (189.09) |
| LLR | -1035.811*** (327.626) | -1118.762*** (317.259) |
| DER | -0.865* (0.508) | -1.014** (0.484) |
| R-squared | 0.569 | 0.847 |
| Mean dep var | 414.514 | 414.514 |
| | <i>F</i> -test (20.058) | Chi-Square (335.020) |
| | Prob > <i>F</i> (0.000) | Prob > Chi-Square (0.000) |

NOTES Dependent variable ALBPB, *** *p* < 0.01, ** *p* < 0.05, * *p* < 0.1. Standard errors in parenthesis.

the Ghanaian context. This makes economic sense as Rosenberg et al. (2013) describe operating expenses as those costs related to personnel and administration. This means that the more personnel and administrative procedures that MFIS employ, the more costly it becomes for them. Given that the average loan balance per borrower is more about the loan size (amount) per borrower, an MFI that is profit oriented will seek to reduce its operating costs and offer relatively larger loan sizes as lower loan sizes will only increase their operating expenses. Thus, in an effort to achieve profitability, MFIS fail to reach out to the poor as doing so will be more costly for them.

Cost per borrower (CPB) is also statistically significant at 1% with a positive correlation. This means that a higher cost per borrower will generally correspond to a higher average loan balance per borrower. The economic implication is simple – larger loans attract higher costs due to more prestigious levels of services that such clients require. This result is consistent with the findings of existing empirical research highlighting that an increase in loan size generally results in an increase in the cost per borrower (Nawaz 2010). By inference, when MFIS strategically and efficiently reduce their cost of lending, they will be able to target the poor in Ghanaian communities. In this sense, cost efficiency will help deepen an MFI's outreach.

With a statistical significance of 1%, the loan loss rate (LLR) variable is negatively correlated with ALBPB. The InterAmerican Development Bank (2002) describes the loan loss rate as an accounting adjustment rather than a cash reserve and it is ultimately a reserve set aside by MFIS to offset any probable losses incurred. The negative correlation of LLR thus suggests that loans of smaller sizes are assumed to have lower recoverability rates. This has a negative implication on outreach as it discourages MFIS from offering smaller loan sizes, thus the poor who can only afford smaller loans will not have their loan requests granted.

Debt to Equity Ratio (DER) is statistically significant at 5% in table 6 and has an inverse relationship with the average loan balance per borrower. The DER variable offers a realistic overview of the financing structure of MFIS and answers the question of how much of an MFI's asset is funded by debt and equity. Based on the results, when an MFI is financed more by debt it is likely to offer smaller loan sizes, thus targeting the poor in the communities. The reverse also holds that when an MFI is financed more by equity, it will likely offer larger loan sizes on average. As profit-oriented MFIS have been known to offer higher loan sizes on average, we

can infer that equity holders who invest in MFIS generally do so for the sake of profit accrual.

**DEPTH OF OUTREACH: PERCENTAGE OF FEMALE
BORROWERS (PFB)**

Table 7 presents the results of both FE model 2 and RE model 2 in estimating the dynamics of depth of outreach specific to the percentage of female borrowers (PFB). Similar to the previous model, we employ the Hausman specification test to identify which of the two models is appropriate and consistent. The results of the Hausman test (table 5) indicate the RE model to be a consistent and more efficient estimator. Therefore, we consider the output of RE model 2 for further discussion. From the results, OEXTA is statistically significant at 5% and has a positive coefficient while CPD and LLR achieve statistical significance at 1% with a negative and positive coefficient, respectively.

The results of RE model 2 indicate a positive relationship between the ratio of operating expense (OEXTA) to total assets and the percentage of female borrowers, contrary to initial assumptions that increases in operating expenses will be a reason for MFIS to shift their focus away from female borrowers. The empirical findings here indicate that the performance of MFIS in terms of their outreach towards the female population is not negatively affected by increases in operational expenditures. Nevertheless, a purely profit-oriented Ghanaian MFI seeking to either reduce costs or increase total assets, or both, would essentially shift away

TABLE 7 Model 2 – Percentage of Female Borrowers (PFB)

| Variable | FE | RE |
|--------------|-------------------------|---------------------------|
| Constant | 0.824*** (0.046) | 0.822*** (0.053) |
| OEXTA | 0.133 (0.085) | 0.181** (0.076) |
| CPB | -0.0001 (0) | -0.0004*** (0) |
| LLR | 0.287** (0.126) | 0.366*** (0.115) |
| PFLO | -0.095 (0.076) | -0.065 (0.066) |
| R-squared | 0.346 | 0.506 |
| Mean dep var | 0.797 | 0.797 |
| | <i>F</i> -test (2.646) | Chi-Square (21.010) |
| | Prob > <i>F</i> (0.018) | Prob > Chi-Square (0.000) |

NOTES Dependent variable PFB, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in parenthesis.

from female borrowers in the communities. This result is in line with the welfarist approach that places more emphasis on the depth rather than the breadth of outreach. Woller, Dunford, and Woodworth (1999) argue that when an MFI focuses on achieving profitability and sustaining its operation, it tends to shift its attention away from the poor as it favours more creditworthy borrowers, although the poor and marginalized are supposed to be the target for microfinance operations.

Cost per borrower (CPB) is statistically significant with a negative coefficient although the effect is minor as the coefficient is closer to zero. This result suggests that the more MFIS focus on lending to female borrowers, the better their chances of slightly reducing the cost of lending. Essentially, it is necessary for MFIS to strategically seek to achieve a reasonable level of cost efficiency in order to continue focusing on female borrowers.

The output from RE model 2 also proves a positive association between the loan loss rate and the percentage of female borrowers. D'Espallier, Guérin, and Mersland (2011) concluded based on their study that when the percentages of female borrowers are high, the portfolio risks tend to be lower and there are fewer write-offs for MFIS, and thus a reduced number of loan losses. The result of our finding in the context of Ghana can be explained as MFIS shifting towards female borrowers after having suffered previous losses – thus, the higher the loan loss rate, the more they shift to female borrowers in response to previous losses and as a corrective measure. This is an alarming outcome as it points towards noticeable biases against the female borrowers and reveals that profitable MFIS will not necessarily improve their coverage to the female population when write-offs are manageable and loan losses are low.

The percentage of female loan officers (PFLO) variable is not statistically significant in this model, thus suggesting that this is not a key factor in promoting or deepening the coverage of microfinance to the female population in Ghana.

BREADTH OF OUTREACH: NUMBER OF ACTIVE BORROWERS (NACB)

In examining the breadth of outreach of MFIS in Ghana, we employ the number of active borrowers (NACB) variable as an appropriate response variable and estimate the effects that the selected regressors have on its dynamics. Similar to models 1 and 2, we use the fixed and random effects estimation to select the most appropriate model based on the results of the

TABLE 8 Model 3 – Number of Active Borrowers (NACB)

| Variable | FE | RE |
|--------------|-------------------------|---------------------------|
| Constant | 29778.488*** (8230.247) | 22321.071*** (6928.887) |
| ROA | 19180.658 (17376.738) | 23410.792 (16319.978) |
| PR30 | -203.395 (14932.942) | 20747.673** (10492.198) |
| LLR | 24946.726 (18092.752) | 29141.521 (17759.209) |
| GLP | 0.003*** (0) | 0.003*** (0) |
| CPB | -90.039*** (14.896) | -72.557*** (8.316) |
| OSS | -12427.047* (6953.855) | -11515.462** (5843.544) |
| R-squared | 0.701 | 0.748 |
| Mean dep var | 16497.028 | 16497.028 |
| | <i>F</i> -test (35.943) | Chi-Square (292.356) |
| | Prob > <i>F</i> (0.000) | Prob > Chi-Square (0.000) |

NOTES Dependent variable NACB, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in parenthesis.

Hausman specification test. Table 8 presents the results of both FE and RE models. However, given the outcome of the Hausman test (table 5), we identify the RE model 3 as consistent, and thus the preferable model which will be the basis for further discussion.

From table 8, it is evident that ROA as a measure of profitability does not have a statistically significant effect on the number of active borrowers although it has a positive coefficient. The portfolio at risk variable with a 30-day threshold (PR30), is however, statistically significant and exhibits a positive correlation with the number of active borrowers. This outcome is contrary to the findings of Abdulai and Tewari (2017), who rightly identified portfolio at risk as a main determinant of MFIS' outreach but also established a negative correlation between portfolio at risk and MFIS' outreach. Given that this study is taken in the context of Ghana, a possible implication of our findings is that when MFIS attempt to pursue lower credit risk, their ability to effectively pursue the goal of outreach will be hampered. RE model 3 also suggests that the loan loss rate has no statistically significant effect on the number of active borrowers.

Gross loan portfolio (GLP) appears to be statistically significant in RE model 3 and has a positive correlation with NACB. This suggests that increasing the gross loan portfolio will directly increase the number of active borrowers. The implication is that MFIS can increase their breadth of

outreach without harming their own efficiency in the process. However, as the GLP measure includes both delinquent and renegotiated loans as well as current loans, it is essential for MFIS to strategically attempt to reduce the proportion of delinquent and renegotiated loans so as not to harm their profit-making attempts. Our results, therefore, indicate that the more an MFI is credit efficient, the more it can improve and increase its breadth of outreach.

Cost per borrower (CPB) is statistically significant and negatively correlated with NACB. The economic implication is that an increase in the cost per borrower reduces the number of active borrowers such that profit-oriented MFIS will reduce their breadth of outreach in an attempt to reduce the cost of lending. Operational self-sufficiency (OSS) is also statistically significant and negatively correlated with NACB, following the same pattern as CPB. This suggests that the number of active borrowers decreases when an MFI increases its outward sustainability. Ultimately, an MFI that is efficiently able to reduce its lending costs can securely increase its breadth of outreach. Thus, outreach may be hindered by profitability but efficiency, on the other hand, encourages it.

BREADTH OF OUTREACH: NUMBER OF DEPOSITORS OF VOLUNTARY TIME DEPOSITS (NDVTD)

Table 9 presents the results of both FE and RE estimates for model 4. However, the results of the Hausman test (table 5) points towards the RE model 4 being the most consistent estimator and thus, the basis for discussion.

TABLE 9 Model 4 – Number of Depositors of Voluntary Time Deposits (NDVTD)

| Variable | FE | RE |
|--------------|----------------------|---------------------------|
| Constant | 2483.542 (3628.55) | 3736.551** (1617.038) |
| OEXTA | -3639.68 (10788.983) | -9531.055** (4616.263) |
| IED | 0.001 (0.001) | 0.002** (0.001) |
| ROA | -686.653 (9225.356) | -6773.764 (6381.51) |
| R-squared | 0.067 | 0.303 |
| Mean dep var | 1909.788 | 1909.788 |
| | F-test (0.358) | Chi-Square (12.590) |
| | Prob > F (0.978) | Prob > Chi-Square (0.006) |

NOTES Dependent variable NDVTD, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in parenthesis.

From table 9, operating expense divided by total assets ($OEXTA$) is statistically significant and has a negative correlation with the number of depositors of voluntary time deposits ($NDVTD$). At the same time, interest expense on deposits (IED) is also statistically significant and has a positive relationship with the $NDVTD$. Both explanatory variables are significant at a 5% level of significance while ROA does not achieve any statistical significance in this model.

The costs of daily operational activities are captured in the operating expenses of an MFI . As such, our results indicate that when an MFI 's operating costs increase, it negatively affects the number of depositors who have voluntary deposit accounts because of the transmission effects of costs, as MFI s will generally attempt to reduce that cost from a number of sources. In that regard, interest expenses paid on these deposit accounts are the most likely to be affected. The consequence of this action will be a reduction in deposits especially, as interest gain is among the main reasons for most Ghanaians holding a deposit account to begin with (Boadi, Li, and Lartey 2015). Additionally, an increase in total assets will reduce the ratio of operating costs to total assets and this will subsequently result in an increase in $NDVTD$. The implication is that a profit-seeking MFI will tend to have more depositors, thus profitability increases the breadth of outreach.

Interest expense on deposits (IED) captures the expense that an MFI will incur on interest-bearing deposits and this is counted as a cost for the MFI . Our results reveal a positive correlation with $NDVTD$ and rightly so in the context of Ghana. Interest rates have become a motivator for people to save in financial institutions (Boadi, Li, and Lartey 2015). Consequently, the higher the interest expense on deposits, the more the depositor accrues in interests from holding a deposit account with the MFI . Although the correlation is positive, it is also minor. This can be explained by the generally limited trust that the Ghanaian populace have in MFI s considering the history of less, or in some cases no, regulation as compared to mainstream banks.

Conclusion

The results of the consistent models in this paper reveal that in an attempt to attain and maintain financial self-sufficiency, MFI s in Ghana inadvertently exclude the poor as they provide larger loan sizes as a cost reduction measure. This is consistent with the findings of Khan et al. (2016), who noted that microfinance outreach is deeper when smaller loan sizes

are offered, thus ensuring that the poor can have access. However, given that smaller loan sizes in Ghana are associated with higher risks of default based on our results, it is no wonder that MFIS lean more towards higher loan sizes, which then inhibits the depth of outreach. Our results also reveal that MFIS that are largely financed by equity offer larger loan sizes while those MFIS that are financed by debt tend to offer smaller loan sizes. The implication is that when MFIS focus on sustainability, they tend to shift their attention away from outreach. Additionally, our findings suggest that MFIS' depth of outreach specific to targeting the female population is not negatively affected by increases in operational costs. However, when MFIS in Ghana pursue thorough operational cost cutting, that could lead to female exclusion as no conscious attempt at targeting female borrowers will be made because of the higher costs involved in such attempts.

Furthermore, our results indicate that an MFI's attempt to achieve profitability has a negative effect on the breadth of outreach. An MFI needs to achieve operational self-sufficiency to be able to increase its outreach to the poor and at the same time cover its costs to ensure continuity (Remer and Kattilakoski 2021). We observe that an MFI that strategically reduces its cost per borrower, thus improving its cost efficiency, is able to broaden its breadth of outreach. At the same time, gross loan portfolio is observed to be positively correlated with the breadth of outreach. On the other hand, our findings also reveal that MFIS face increased risk as they broaden their outreach given the positive correlation that the portfolio at risk variable has on outreach. More so, interest expenses on deposits are observed to have a positive correlation with breadth of outreach as interest is a major factor that drives people to hold deposit accounts. However, when considering operating expenses as a ratio to total assets, we observe a negative correlation with outreach.

These findings provide deeper insights into the effects of sustainability measures on MFI outreach in Ghana and also provide evidence that the financial performance of MFIS in Ghana has a direct impact on their ability to reach out to and support the poor. The social and economic implications of these findings are enormous. First, we reveal that there are noticeable biases against female borrowers as MFIS do not deliberately attempt to improve their coverage to the female population on a 'good day' when loan losses are manageable, and risks are low. This reveals gender equality cracks in the microfinance sector and highlights the need for government and other stakeholders to incentivize the targeting

of female borrowers to bridge any existing gaps as well as provide adequate social infrastructures that are able to connect poor borrowers to MFI services. Additionally, given the still existing lack of confidence in the microfinance sector, the establishment of a properly functioning national insurance deposit system will do well to restore the lost confidence. This has been established in countries like Canada, USA and Nigeria, and it works (Boateng 2015). Finally, having established that efficiency promotes outreach, it becomes necessary for prudent MFI regulatory bodies to incorporate efficiency standards as a matter of regulation.

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