University of Southampton

Faculty of Social Sciences

Southampton Business School

An Assessment of Microfinance Institutions' Social Performance: Evidence from Worldwide Panel Data

DOI [https://doi.org/10.5258/SOTON/D1696]

by

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Thesis for the degree of Doctor of Philosophy

October 2020

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Abstract

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A key of microfinance is to reach the poor with easy access to credit and small collateral. The evolution of microfinance has raised attention to researchers and academicians in analysing dual mission of Microfinance Institutions (MFIs); outreach to the poor and financial sustainability. However, some issues are not adequately addressed by the literature, which among them are gender issues, understanding of outreach and efficiency. This study discovered gender bias in MFIs that led this study to explore the drivers of social outreach to women. Besides, limitation in literature analysing different aspects of social performance motivate this study to explore different types of outreach and social efficiency. By employ longitudinal panel data of 10 years (2005 to 2015) of 2,330 operating MFIs across six regions (Sub-Saharan Africa, East Asia and Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, and South Asia), this study analyse seven types of outreach, namely; outreach to women, breadth of outreach, depth of outreach, costs to users (worth of outreach), length of outreach, the scope of outreach by deposits, and scope of outreach by a loan. This study links the organisational characteristics (women managers, target market, legal ownership status, financial structure) with MFIs' social outreach performance. The findings provide insight on gender bias of MFIs management practices as we find women managers are more inclined to reach women entrepreneurs among their borrowers, as compared to men managers. This study implies the vital role of gender composition across MFIs management level. Moreover, the results reveal that the impact of the financial instruments chosen by MFIs in the financial structure (assets, equity, borrowing

and deposits) varies on its societal performance. This study finds MFIs that prefer conservative lending such as assets focusing on increasing borrowers through large-sized loans but less outreach to women. However, when external sources (borrowing and deposit) are brought in, MFIs attract a high proportion of women borrowers and focus on utilising both scopes of outreach (deposit account and loan portfolio). In correlation with social efficiency performance, this study find that MFIs are not reaching enough to the poor as there are controllable and uncontrollable factors influencing MFIs social efficiency of MFIs. Social inefficiencies of MFIs are originated from factors beyond the control of MFIs management, when they focus on depth, costs, length, and scope of outreach. These inefficiencies of MFIs arise mostly from external shocks such as related regulations and moral hazard issues in the rural populations, that caused waste and mismanagement of resources. Meanwhile, when MFIs focus on outreach to women and breadth of outreach, they rely on factors under the control of MFIs' management such as operating costs and labour.

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Research Thesis: Declaration of Authorship

Print name: Zarith Sofia Binti Jasmi

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I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

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Acknowledgements

In the name of God, the Most Gracious, the Most Merciful.

All praises to God for the strengths and His blessing in completing this thesis. Special appreciation goes to my supervisors, Associate Professor Dr Jagannadha Pawan Tamvada and Associate Professor Dr Vadim Grinevich, for their supervision and constant support. Their invaluable help of constructive comments and suggestions throughout the thesis has contributed to the success of this thesis.

My deepest gratitude goes to my beloved family for their endless love, prayers and encouragement throughout this journey.

Last but not least, appreciation also goes to all staffs in the School of Economics and Muamalat, Islamic University of Science Malaysia for the support and help towards my postgraduate affairs.

To those who indirectly contributed to this research, your kindness means a lot to me. Thank you very much.

Definitions and Abbreviations

MFIs	Microfinance Institutions
MFI-banks	Microfinance Institutions – banks
NGOs	Non-governmental organisations
NBFIs	Non-bank financial institutions
DFI	Development Financial Institutions
PAR30	Portfolio-at-risk more than 30 days
DEA	Data Envelopment Approach
SFA	Stochastic Frontier Approach
DFI	Development Financial Institutions

Chapter 1 Introduction

1.1 Background of Study and Problem Statements

The introduction of microfinance is an innovative intervention tool for households and small firms at the bottom of the economic pyramid in terms of access to formal institutions for financing (Augustine et al., 2016). The "Base of the pyramid" or "Bottom of the pyramid" introduced by Hart and Prahalad in 2002 represent people at the bottom of the economic pyramid, determined based on a person's daily income (Subhan and Khattak, 2017). There are four segments of an economic pyramid based on the World Bank statistical data of 2008 as follows: The first segment is the upper class with the highest income, the second is upper middle class with lower income, followed by lower middle class, and the last segment is a lower class, the 'poorest of the poor' (Subhan and Khattak, 2017). Microfinance is not just banking –it is a development tool because it involves small loans typically for working capital, progressive lending, collateral substitutes, and access to larger loans based on repayment performance (Ledgerwood, 1998; Kimando et al., 2012). The purpose of MFIs is outreach to the poor by providing loans with greater flexibility compared to traditional banks, emphasizing the social aspect of banking through the availability of capital for those in need (Ledgerwood, 1998; Gdjonsson, et al., 2020). However, some issues are not adequately addressed by the literature; among them are gender issues, understanding of outreach, and social efficiency.

In relation to gender issues, literature explains that women's access to microfinance is challenging because of their unfavourable financial background, social norms, and cultural norms (Johnson, 2000; Staveren, 2001). Literature criticises discretionary power of credit officers and branch managers to women (Maîtrot, 2018), high-interest rates charges (Janda

and Turbat, 2013; Aggarwal et al., 2015; Abdullah and Quayes, 2016, among others), and lack of support or cooperation from banks, supplier, and marketing intermediaries (Singh and Belwal, 2008). These challenges faced by women have drawn the attention of scholars to investigate the understanding of outreach to women and the importance of women as a central function of MFIs. This is because, by focusing on women, MFIs can improve women's economic condition (Worthen, 2012) and enhance their empowerment (Afrin, 2010). However, there is little systematic literature that investigates the driving forces of MFIs outreach to women. There are studies determining the positive relationships between gender diversity in management and outreach to women because women indeed have a better understanding of women's financial needs (Bellucci et al., 2010; Beck et al., 2013; Damme et al., 2016, among others). Yet, literature is more case-specific as it is difficult to understand what drives women's outreach. Thus, there is a need to address this area of social outreach to women in greater detail across different regions, and globally. Furthermore, MFIs are a diverse group of institutions. There are significant differences across MFIs in their organisational form, legal status, financial structure, and targeted consumer market. These differences in organisational characteristics can influence their approach towards women clients and their needs. This motivates to explore the drivers of MFIs outreach to women.

In relation to the understanding of MFIs' outreach, most of the literature focuses on the issue of mission drift or trade-off by MFIs (Bassem, 2009; Hermes et al., 2011; Adhikary and Papachristou, 2014, among others). Literature is concerned about MFIs shifting their mission from focusing on social outreach per se to outreach or social (these words are used interchangeably in this study) and financial sustainability. Literature explains that the causes for the mission change are growing commercialisation, competition among microfinance lenders, and the decreased availability of traditional donor sources of the fund (Biekpe and Kiweu, 2009; Ghosh and Tassel, 2011; Abate et al., 2014). This imposition of financial

sustainability by MFIs leaves an impact on MFIs' outreach performance; yet very there is little systematic insight offered by the literature addressing the understanding of outreach. Most literature discusses MFIs' financial profitability and sustainability performance (e.g., Kar, 2013; Bhanot and Bapat, 2015), the impact of governance and regulation on MFIs performance (e.g., Hartarska, 2005; Hartarska and Nadolnyak, 2007; Pati, 2012), the effect of socioeconomic and macroeconomic on MFIs' performance (e.g., Ahlin et al., 2010; Al-Azzam et al., 2012; Ashraf et al., 2014), and competition and commercialisation (Assefa et al., 2013; Cull et al., 2014; Johnson, 2015). As researchers undertake studies on outreach, they mostly discuss two essential aspects of outreach: (i) breadth – ability to reach many clients and (ii) depth – the ability to reach the poorest (e.g, Vanroose and D'espallier, 2013; Adhikary and Papachristou, 2014; Khatchatryan, 2017). Thus, this opens avenues to analyse the different types of outreach performance.

In relation to efficiency, there are discussions in the literature that a fundamental decision in measuring financial institution efficiency is which concept to use (Berger and Mester, 1997). Generally, there are three types of efficiency concept measured in the literature, which are allocative efficiency (e.g., how closely a microfinance cost lies to the efficient cost frontier for a given technology), technical efficiency (e.g., the efficiency of MFIs in using resources in the production process with a given technology), and economic efficiency (e.g., requires both technological and allocative efficiency, where the optimal inputs and/or outputs are chosen based on both the production technology and the relative prices in the market). The use of different efficiency concepts may give significantly different rankings of firms depending upon the relationship between managers' abilities to use the best technology (technical efficiency) and their abilities to respond to market signals (allocative and economic efficiency) (Bauer et al., 1998). In measuring microfinance efficiency, Bassem (2014) explained that there are two components, which are financial efficiency (MFIs are

more efficient when the productivity of MFIs is large) and social efficiency (the ability of MFIs in resource utilisation when reaching to society). A considerable body of literature analyses the performance and efficiency of MFIs, such as Abayie et al., (2012), Abdelkadir et al., (2014) and Azad et al., (2015), among others. However, extant studies tend to focus more on financial efficiency (e.g., Gutiérrez-Nieto et al., 2007; Abate et al., 2014; Collins, 2019) and less on social efficiency. As prior studies carry out research on outreach efficiency, they focus more on outreach to women, breadth, depth, and the scope of outreach by loan (e.g., Servin et al., 2012; Bassem, 2014; Wijesiri et al., 2017). In addition, only few literatures explore the driving factors influencing social outreach efficiency of MFIs leading this research to explore more in this area.

1.2 Research Objectives

Given the above three sets of issues identified, the overarching aim of this thesis is to advance understanding about the nature, scale, and factors of social outreach of MFIs by focussing on the following research objectives.

- To examine the role of organisational structure on MFIs' outreach to women.
- To determine the impact of financial structure on different types of MFI social outreach.
- To explore MFI efficiency levels in the context of social outreach.

1.3 Methodology

In order to achieve these objectives, this study undertook quantitative studies by collecting the secondary data of MFIs' financial, operational, and social information from the

Microfinance Information Exchange Market database in 2005. It is believed that 10 years period (2005 – 2015) is sufficient to analyse the social performance of MFIs. As the Mix Market database consists of self-reported MFIs, the available sample of study to be collected involves 2,330 MFIs operating in 116 countries. This study accessed geographical studies, involving MFIs across six regions (Sub-Saharan Africa, East Asia, and the Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, and South Asia). This study also collected country data from World Bank development indicators.

This research is a longitudinal study as it involves observations and data collection of the same subjects for an extended period to address the problem. Methodologically, this study used deductive reasoning in this study as it starts with hypotheses or questions, which are derived from theory or previous research. The results are presented using statistics and the verification and falsification of the proposed hypotheses were tested.

1.4 Contribution of Study

The first paper contributes to the microfinance gender literature by suggesting that the presence of women representatives at the managerial level within MFIs enhances their outreach and lending to women. This finding also contributes to the entrepreneurship literature by enhancing the role of gender composition across all management functions within MFIs as an important intra-organisational mechanism in reaching out to women entrepreneurs.

Besides, the first paper contributes to the microfinance literature regarding the effects of organisational characteristics on MFIs' outreach performance. This study finds that the differences in ownership and governance structure result in different organisational objectives. This study finds that NGOs are the most consistent in the outreach to women, driven by their social goals, strengthening the claim by earlier literature on NGOs (Fernando, 2004; Bassem, 2009; Vanroose and D'espallier, 2013). Compared to other MFIs' legal forms, NGOs have the highest proportion of women entrepreneurs among their borrowers. Furthermore, the findings contribute to the implications for decision-makers in correlation with the chosen market segmentation. This is because the decision on market segmentation affects how they reach women entrepreneurs. This study finds that MFIs have a high proportion of women borrowers when they target low-income clients with small loan sizes. Conversely, they have a small proportion of women borrowers when serving medium and large loan sizes.

The second paper contributes to the methodological implications regarding outreach assessment by covering broader and more comprehensive on different types of outreach, as most literature (e.g., Vanroose and D'espallier, 2013; Adhikary and Papachristou, 2014; Quayes, 2015;) focuses on the three outreach dimensions (women borrowers, depth, and breadth). This research empirically assesses and analyse seven types of outreach –outreach to women, breadth of outreach, depth of outreach, costs to users (worth of outreach), length of outreach, the scope of outreach by deposit, and the scope of outreach by loan. This study also involves a richer database consists of 2,330 operating MFIs across 116 countries across the world, with panel data of 10 years period.

The second paper also contributes to managerial implications regarding the effects of the diversity of financial strategies on MFIs' outreach. This study finds that MFIs that depend on conservative lending strategies such as assets have a negative impact on the depth of outreach as they are more focused on targeting more affluent clients who can absorb large loan sizes. On the other hand, when MFIs rely on external financing (debt financing and deposit-taking), MFIs lean towards raising the interest rate above the market price when reaching out to the poor. The finding reflects prior literature (Berlin and Mester, 1999), emphasising the advantages of liquidation ability from commercial borrowings and using a deposit as a cushion against the credit risk shocks. This study implies that the exposure of external sources leads to MFIs in benefiting economies of scope, as they focus on a variety of products (loan portfolio and deposits account). Moreover, the findings also provide insights for financial strategists in preparing for the loan losses, as dealing with the poor with an uncertain financial background is riskier for the institutions.

The third paper contributes to practical implementations for MFIs as employers to improve social impact through intra-organisational human resource guidelines. This is because the findings show that MFIs rely on inefficiency term or internal factors such as operating costs and labour (personnel) when focus on reaching out to the poor (breadth of outreach) and women (outreach to women). MFIs should improve their organizational communication between different functions or between managers and employees to work together to increase their social efficiency.

The third paper also provides guidelines for regulators and self-regulatory bodies to improve social impact through rules and regulation that ties MFIs operating activities. This study reveals that social outreach of inefficiencies of MFIs mainly originated from external shocks

or factors beyond the control of MFIs management when they focus on outreach performance (depth, costs to users, length, and scope of outreach by deposit and loan). The plausible external factors that can be suggested here are *regulation* and *rural population*. These results are consistent with the claim that MFI-banks are driven more by the financial perspective as they are supervised by central banking rules and regulations, and are heavily regulated by monetary authorities (Servin et al., 2012). Besides, MFI-banks also operate as commercial banks by relying on specialised staff to build a profitable portfolio of loans, and mainly focusing on the size of the loan that guarantees borrowers (Gutiérrez-Nieto et al., 2007). On the other hand, the moral hazard issues in rural areas are due to the uncertainty of borrowers' financial background, which might cause MFI efficiency production and mismanagement of resources affecting the social efficiency of MFIs (Haq et al., 2010).

In general, this doctoral research provides guidelines for policy implementation for government to reduce the base lending rate, more extended repayment period and small collateral – factors that affect the poorest in paying the monthly instalments. Besides, the government should enforce mandatory savings for all risky borrowers, where the borrowers can withdraw the savings before the loan matures to use as supporting collateral in the case of loan default.

Chapter 2 Do Women Favour Women? Exploring Factors of Microfinance Outreach to Women

Abstract

With microfinance institutions (MFIs) appearing in a variety of organisational forms, there is little systematic understanding of the effects of MFI organisational structure and characteristics on their outreach to women, particularly in a global and regional context. Based on panel data of 2,330 MFIs operating across 116 countries between 2005 and 2015, our results provide new insights into gender bias of MFI management and financial structures, both globally and across major world regions, and reveal a set of specific organisational channels through which the MFI outreach to women can be reinforced. In particular, this study finds that MFIs with a relatively high representation of women across all management functions have a higher share of women among their borrowers. These effects are strong not only for non-commercial organisations, such as NGOs, but also for more commercial and regulated MFIs, which may alleviate existing concerns about incompatibility between the commercialisation of microfinance and its social mission. This study also finds that MFIs pursuing diversified financial strategies are more likely to increase MFI social impact. This study finds it alarming that in every single global region, microfinance institutions prioritising relatively large and medium size loans are significantly disadvantaging women borrowers.

2.1 Introduction

Access to microfinance can help individuals to diversify their sources of income and improve their wellbeing. Most recently, there has been an increasing interest in the benefits of microfinance in relation to women, who are often viewed as a disadvantaged group of borrowers (Wydick, 2002; Porter, 2016; Valencia-Fourcans and Hawkins, 2016; Dutta and Mallick, 2018). It is found that access to microfinance can significantly help women to meet recurrent expenses, improve their home amenities, accumulate new assets, and make investments (Drolet, 2009; Garikipati, 2012; Nguyen and Hollister, 2012). An easy access to capital in the form of small loan develops an opportunity for women to enter entrepreneurship, growing a small business, and allowing them to raise their standard of living (Newman et al., 2017).

Outreach refers to MFIs' ability of to expand their client base in providing greater number of poor beneficiaries with microfinance services (Getubig et al, 2000). Outreaching women are viewed as a universal mission by MFIs through positioning themselves as social enterprises by providing financial services to under-served female entrepreneurs, ensuring the international community recognize and acknowledge women as entrepreneurs without issues of gender inequality (Drori, et al., 2020). In this context, microfinance institutions (MFIs) and their outreach to women entrepreneurs are of compelling interest to academics and policy makers. An emerging body of literature critically evaluates how MFIs treat their women entrepreneurs, and suggests that they may charge unreasonably high interest rates (Nguyen and Hollister, 2012; Brana, 2013; Khan and Khan, 2016), apply unfavourable saving account regulations (Nguyen and Hollister, 2012; Schuster, 2014), and exercise coercion when providing loans (Maîtrot, 2018). MFIs can also be hesitant in their lending decisions due to women's financial history (Fletschner, 2009; Fofana et al., 2015) or marital

status (Kayser et al., 2010; Geleta, 2016). As MFIs can take a variety of organisational forms, with varying business and financial strategies, governance and ownership structures, and organisational priorities (Adhikary and Papachristou, 2014; D'espallier et al., 2017), this chapter explores the relationship between organisational characteristics of MFIs and women entrepreneurship. The existing literature provides very little systematic insight into this, particularly from a global or regional perspective (D'Espallier et al., 2011, 2013), and mainly focuses on the determinants of the financial performance of MFIs. This study bridges this gap by examining the patterns of microfinance lending for women entrepreneurs, and the role of MFIs' organisational characteristics in shaping these patterns, across the world and its major regions.

Based on panel data on 2,330 MFIs operating across 116 countries from 2005 to 2015 period, this study find that organisational characteristics have a significant impact on microfinance for women entrepreneurs. In particular, MFIs with a relatively high proportion of women managers have a higher share of women entrepreneurs among their borrowers, pointing to a delicate relationship between the gender gap at the level of management of microfinance organisations and its socio-economic implications. In this regard, this study departs from the prior literature (e.g., Hartarska et al., 2014; Damme et al., 2016) to emphasise the effects of gender composition across all management functions within MFI, and not only that of selected management roles. This study also finds that these effects are strong not only for non-commercial organisations, such as NGOs, but also for more commercial and regulated MFIs, such as microfinance banks and cooperatives, which may to some extent alleviate growing fears in the existing literature about incompatibility between the commercialisation of microfinance and its social mission (D'Espallier et al., 2013). Furthermore, this study finds that MFIs pursuing a conservative self-sufficiency strategy, largely depending on their assets when designing their microfinance offerings, are significantly less outreaching to

women entrepreneurs. By contrast, MFIs which are using other sources of finance such as debt and deposits tend to support a significantly larger proportion of women entrepreneurs, implying that more diversified financial strategies pursued by less conservative MFIs are more likely to result in higher social impact. This study finds it alarming that in every single global region, microfinance institutions prioritising relatively large and medium size loans have a significantly smaller proportion of women entrepreneurs among their borrowers, implying the presence of widespread societal issues related to women's access to capital as well as broader economic and entrepreneurial opportunities available to women.

The rest of the chapter is organised as follows. Section 2 discusses women entrepreneurs and microfinance organisational characteristics, and develops hypotheses linking organisational characteristics of MFIs with MFIs' outreach to women entrepreneurs. Section 3 discusses the empirical methodology used to test the hypotheses. Section 4 reports descriptive statistics and summarises the results of econometric analysis. The last section further discusses the results before concluding and highlighting the future research agenda.

2.2 Microfinance and Women Entrepreneurship

2.2.1 The Context

Microfinance plays a supporting role in women entrepreneurship, bringing equality of women and men in the social environment (Cak and Degermen, 2015) through creation of new entrepreneurial opportunities and providing easy access to small capital to start a new small business or expand and existing business (Afrin et al., 2010; Cak and Değermen, 2015). Traditionally, women are perceived as the most disadvantaged economic group, particularly in terms of income and bargaining power within household decision making

(Dutta and Mallick, 2018). Traditional financial institutions are bias towards women particularly from banks due to their unfavourable financial conditions and lack of personal fund or belongings as collateral (Brana, 2013; Staveren, 2001). In addition, conventional banks have prioritised the needs of male customers because women tend to save, and borrow smaller amounts than men. However, they borrow regularly to meet irregular cash inflow, which involves higher administrative costs for the bank (Staveren, 2001). Therefore, microfinance has become the main financial source that women entrepreneurs rely on when they need access to small loans, innovative forms of collateral, and simpler application procedures (Swapna, 2017). They use the loan for retail selling of households, and agricultural and trading activities, and the profit gained is invested for consumption, education, medical and health (Lott, 2009; Togba, 2012; Aseanty and Hassan, 2013). Microfinance encourages women entrepreneurship with the initial micro-loan obtained to establish their own business or grow the existing business and at the same time achieve saving opportunities for their future investments (Cak and Değermen, 2015).

The positive impact of microfinance on women entrepreneurs, in terms of income (Hillenkamp, 2015), and financial independence (Boehe and Cruz, 2013) suggests that providing microfinance contributes to greater freedoms for women and dissolves the social gap. Microfinance also successfully increases employment opportunities for women to become entrepreneur (Wydick, 2002), and, by gathering with others in the same positions, women entrepreneurs' social and commercial environments are expanded (Cak and Değermen, 2015). In addition, after accessing microfinance, women entrepreneurs create employment for many more women in the community and in a country, due to empowerment and motivation (Swapna, 2017). MFIs therefore emerged as a strategic tool for women entrepreneurs by empowering them within communities and society (Mayoux, 2001), enhancing women's power in decision making (Fatima, 2011; Rahman et al., 2009; Holvoet,

2005) and allowing them to gain recognition from their families and relatives (Afrin et al., 2010). The assistance microfinance provides to women entrepreneurship is crucial for economic development as microfinance (i) economically engages income-generating activities by enabling women to own an additional income, (ii) gives them the ability to make savings (Cak and Değermen, 2015) and (iii) grows female-owned enterprises (Swapna, 2017).

Yet, as MFIs vary in terms of organisational structure, their outreach to women might also differ. Women entrepreneurs in developing countries raise concerns on MFIs' effectiveness in helping women as they are still facing challenges in accessing micro-credit. It is reported that MFIs do not provide the loans for the requested amounts and slash the amount without any explanations despite the high-interest rates they charge on them (Belwal et al., 2011; Nguyen and Hollister, 2012; Brana, 2013). Moreover, women entrepreneurs report a lack of cooperation from banks, suppliers, and marketing intermediaries, and face problems in finding the markets and distribution networks (Singh and Belwal, 2008; Brana, 2013). Low growth financing or low credit limit, lack of business support services, lack of sufficient financial resources and low access to formal savings means that in terms of the upgrading and upscaling processes, growth-oriented women entrepreneurs' businesses grow slower than male-run businesses (Carrington, 2006; Singh and Belwal, 2008; Narita et al., 2014).

Nonetheless, the influence of organisational characteristics of MFIs on women entrepreneurs remains relatively unexplored, motivating this study to fill the gap in this extant literature. In the following subsection, this study develops hypotheses linking organisational characteristics and their implications for lending practices related to women entrepreneurs as micro-credit borrowers.

2.2.2 Hypotheses

(a) Gender composition of MFI management

A small but growing body of literature on women leadership at MFIs suggests that the presence of women on the board or within the top management team can be associated with relatively high MFIs lending for women. Women directors tend to be more socially oriented, concerned about the gender inequality, and less risk-averse when reaching out to women (Hartarska et al., 2014; Damme et al., 2016; Strøm et al., 2016; Thrikawala et al., 2016). Studies investigating the relationship between the gender of lending officers in banks and loan applications approvals also suggest that lower collateral requirements are imposed on women by women loan officers (Bellucci et al., 2010). According to Beck et al., (2013), women loan officers tend to have a performance advantage over their male colleagues when dealing with women borrowers, suggesting that women bankers are better at building trusted relationships with women clients. In particular, women bankers are better at understanding financial needs of women, know what financial products suit women, and are likely to set terms and conditions that appeal to women clients.

These observations are consistent with psychological studies acknowledging substantial differences in economic behaviour by gender, with women responding more positively to others' feelings and concerns, particularly when engaging with women (Eagly and Johnson, 1990; Eckel and Grossman, 1998; Beaman et al., 2011). In this context, MFIs that encourage women representation across all management functions, not only in top-tier management, are more likely to accommodate women-friendly procedures, and can be expected to outperform in terms of outreach to women. Hence, this study proposes the following:

Hypothesis 1: A greater proportion of women management staff within MFIs is likely to lead to a higher proportion of women borrowers.

(b) Organisational legal form

MFIs assume a variety of legal forms such as private companies, shareholder firms, microfinance banks, non-bank financial institutions (NBFIs), cooperatives and mutual organisations (Tchuigoua, 2010; Périlleux et al, 2016). They are organised as both not-for-profit as well as for-profit institutions. Differences in ownership and governance structure across MFIs can result in different approaches to women borrowers. Compared to commercially oriented organisations, not-for-profit institutions such as non-government organisations (NGOs) are more driven by social goals, and are more likely to be associated with reaching out to women (Kar, 2012; Servin et al., 2012; Barry and Tacneng, 2013; D'Espallier et al., 2013; Bassem, 2009). Thus, consistent with the prior literature, this study suggests the following:

Hypothesis 2: NGOs are more likely to have a higher proportion of women borrowers, compared to other legal forms of MFIs.

(c) Target lending market

The outreach of MFIs to women can be impacted by their target customer market as some MFIs tend to focus on wealthier borrowers capable of absorbing larger loans (Cull et al., 2009; 2015; D'Espallier et al., 2013). By prioritising loans to more affluent clients, these MFIs focus on improving their financial sustainability while sacrificing the target of

reaching out to disadvantaged communities, where women are more likely to be overrepresented. Furthermore, women are more likely to be supported by MFIs that offer loans of a smaller size (Hermes et al., 2011; Abate et al., 2014) and, thus, can miss out on larger loans if there is prioritisation of high-end customers for larger loans (Togba, 2012). Conversely, MFIs focusing on less affluent clients provide small-size loans and are more likely to reach out to women borrowers. This leads to the following hypothesis:

Hypothesis 3: MFIs targeting higher income clients are more likely to have a lower proportion of women borrowers.

(d) Financial structure

MFI characteristics related to their funding instruments can underscore how their financial structure and related financial priorities impact their outreach to women. For instance, different configurations of funding sources of MFIs can be associated with different costs of capital and different costs of lending (Titman and Wessels, 1988), with women entrepreneurs expected to be more sensitive to such variations. More specifically, this study considers the influences of assets, equity, debt, and deposit requirements on women outreach of MFIs.

Assets

MFI assets refer to all asset accounts such as financial assets, earning assets, cash, and net fixed assets (CGAP, 2002). Total assets represent a standard measure of an institutional size (Serrano-Cinca and Gutierrez-Nieto, 2014). MFIs that have larger assets are expected to be more self-sufficient operationally due to their stronger ability to accommodate risk and enhance productivity through diversification of products and services (Bassem, 2009; Bogan, 2012; Pati, 2012). According to Kar (2013), larger MFIs are more experienced but

tend to provide fewer financial services to their women clients. This may be due to their focus on wealthier clients with 'uncompromised' financial background (Rahman et al., 2009; Estape´-Dubreuil and Torreguitart-Mirada, 2010; Corsi and Angelis, 2016). Hence, this study proposes the following:

Hypothesis 4a: MFIs with higher total assets are more likely to have a lower proportion of women entrepreneurs among their borrowers.

Equity financing

Equity financing through selling shares on the market can be an important source of funding for MFIs (Bogan, 2012). There is some evidence that targeting women is associated with a high return on equity (Omri and Chkoundali, 2011; Campbell and Rogers, 2012). The literature also suggests that having greater equity can be tied to specific outreach targets including women (Gakhar and Meetu, 2013; Abdullah and Quayes 2016). This study, therefore, posits the following:

Hypothesis 4b: MFIs with a higher dependence on equity financing are more likely to have a higher proportion of women borrowers.

Debt financing

Debt financing refers to MFIs acquiring loans from other financial institutions to support microfinance operations. These loans can be provided based on either market or concessional (below market) interest rates (Mersland and Urgeghe, 2013). MFIs' access to concessional loans can be linked to their outreach mission and gender policy (Mersland and Urgeghe, 2013). This study may expect MFIs that increasingly use debt financing to be interested in

receiving concessional loans, which should result in a higher outreach to women. Hence, this study suggests the following:

Hypothesis 4c: MFIs with a higher dependence on debt financing are more likely to have a higher proportion of women borrowers.

Deposit requirements

Taking compulsory deposits can help MFIs reduce the cost and risk of loans (Mia and Chandrian, 2016). MFIs that rely more on deposit-taking as a source of finance may be more likely to lend to women with a less than perfect financial history, as their compulsory deposits can be used as collateral in the lending cycle (Fan et al., 2012). While this study should also acknowledge that compulsory deposit requirements may be difficult to meet for some women borrowers (Nguyen and Hollister, 2012; Schuster, 2014), this study can propose the following:

Hypothesis 4d: MFIs with a high dependence on deposit financing are more likely to have a higher proportion of women borrowers.

2.3 Methodology

2.3.1 Data

This study involves empirical analysis based on large-scale data generated by the Microfinance Exchange Market (M.I.X. Market) portal, and available from www.themix.org. The data cover activities of 2,330 MFIs across 116 countries over the period from 2005 to 2015. The M.I.X Market database provides information on MFIs' financial, operational, and social characteristics including staff, cost efficiency, profitability,

self-sufficiency, and sustainability. In relation to key macroeconomic and demographic characteristics (such as Gross Domestic Product (GDP), population density, women population, and inflation), we use World Bank data available www.worldbank.org.

2.3.2 Method

To empirically test the hypotheses, this study estimates a pooled fractional logit model (Papke and Woolridge, 1996) alongside an ordinary least square (OLS) model (Hayes and Cai, 2007), with the dependent variable being *MFI outreach to women entrepreneurs*, measured as a fraction of women borrowers in each institution. The OLS runs regression for pooled MFIs, which is used as a benchmark for the results. This study believes the majority of the women borrowers enter into small business and entrepreneurship by taking loans from MFIs. The MFI outreach is regressed on a set of independent variables such as fraction of women managers, target market, legal form, and financial structure characteristics, as detailed in Table 1.

Table 1 Description of variables

Variables	Description	Mean	Std. Deviation	Min	Max
Dependent:					
Women outreach	Fraction of women borrowers (Number of women borrowers / numbers of all active borrowers).	.611	.289	0	1

Independent:					
Women managers	Fraction of women managers (Number of women management staff / number of all management staff).	.327	.271	0	1
Target Market					
Low-end	1, if depth <20% or average loan size < $150, otherwise 0.	.433	.496	0	1
Broad-end	Depth is average loan balance per borrower/Gross National Income per capita.				
High-end	1, if depth between 20% and 149%, otherwise 0.	.463	.499	0	1
	1, if depth over 150%, otherwise 0.	.103	.304	0	1
Legal form					
MFI-bank	A licensed financial intermediary regulated by a state banking supervisory agency. It may provide any of a number of financial services, including deposit taking, lending, payment services and money transfer.	.092	.289	0	1

	1 if Yes, otherwise 0.				
Cooperative	A non-profit, member-based financial intermediary. It may offer a range of financial services, including lending and deposit taking, for the benefit of its members. While not regulated by state banking supervisory agency, it may come under the supervision of regional or national cooperative councils. 1 if Yes, otherwise 0.	.172	.377	0	1
NGO	An organisation registered as a non-profit for tax purposes or some other legal charter. Its financial services are usually more restricted, so do not include deposit taking. These institutions are typically not regulated by a banking supervisory agency. 1 if Yes, otherwise 0.	.337	.473	0	1
Rural bank	Banking institutions that target clients who live and work in non-urban areas and who are generally involved in agricultural-related activities. 1 if Yes, otherwise 0.	.043	.204	0	1
Other NBFI	An institution that provides similar services to those of a bank, but is licensed under a separate category. The separate license may be due to	.356	.479	0	1

	lower capital requirements, to limitations on financial service offerings, or to supervision under a different state agency. In some countries this corresponds to a special category created for microfinance institutions. 1 if Yes, otherwise 0.				
MFI financial structure					
Assets	Ln; Total value of resources controlled by the Financial Service Providers (FSP) as a result of past events and from which future economic benefits are expected to flow to the FSP. For calculation purposes, assets are the sum of each individual asset account listed.	15.488	2.315	0	24.567
Equity financing	Ln; The residual interest in the assets of the financial institution after deducting all its liabilities. For calculation purposes, equity is the sum of each equity account listed.	14.150	2.360	0	22.587
Debt financing	Ln; Total borrowing of MFIs by taking a loan from other financial institutions	10.660	6.732	0	22.993

Deposit	Ln; The total value of funds placed in an account with the FSP that are payable to a depositor. This includes accounts such as current/transactional accounts, term accounts, interest-bearing accounts, and e-money accounts.	7.300	7.561	0	24.089
Controls:					
MFI size	Ln; number of MFI branches.	2.414	1.309	0	8.432
Gross Domestic Product	Ln; National income/National output and national expenditure.	25.013	1.998	19.578	30.029
Population density	Ln; The total number of people/areas of land (measured in square miles or square kilometres).	4.442	1.165	.965	7.121
Women population	Ln; based on the *de facto* definition of population, which counts all female residents regardless of legal status or citizenship.	16.713	1.677	10.854	20.315

Inflation	Ln; Sum of (Retail Price Index x Weighted Price Index)/Weighted Price Index x 100.	6.914	5.153	-10.067	53.231
Region					
Sub-Saharan Africa (SSA)	1 if Yes, otherwise 0. Countries included: Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, the Democratic Republic of the Congo, Republic of the Congo, Cote d'Ivoire, Ethiopia, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, and Sierra Leone.	.208	.406	0	1
East Asia Pacific (EAP)	1 if Yes, otherwise 0. Countries included: Cambodia, People's Republic of China, East Timor, Fiji, Indonesia, Laos, Malaysia, Myanmar (Burma), Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Tonga and Vietnam.	.122	.327	0	1

Eastern Europe and Central Asia (EECA)	1 if Yes, otherwise 0. Countries included: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Kosovo, Kyrgyzstan, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Tajikistan, Turkey, Ukraine, and Uzbekistan.	.173	.379	0	1
Latin America and the Caribbean (LAC)	1 if Yes, otherwise 0. Countries included: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay and Venezuela.	.289	.453	0	1
Middle East and North Africa (MENA)	1 if Yes, otherwise 0. Countries included: Egypt, Iraq, Jordan, Lebanon, Morocco, Palestine, Sudan, Syria, Tunisia, and Yemen.	.043	.202	0	1
South Asia (SA)	1 if Yes, otherwise 0. Countries included: Afghanistan, Bangladesh,	.165	.371	0	1

Bhutan, India, Nepal, Pakistan and Sri Lanka.

When calculating the fraction of women managers, management staff comprises chief executives, board members, upper management, managers, and loan officers. The target market variable is defined by the ratio of average loan size to average income, and represented by three bands; these are low-end, broad-end and low-end. The legal form variable distinguishes between five types of institution: (i) *Microfinance banks* are regulated by central banking authorities and offer small-scale credit to unprivileged people, normally with small collateral. (ii) *Cooperatives* are jointly owned and democratically managed by their members (Bezboruah and Pillai, 2015). (iii) *NGOs* are normally stakeholder-centred and not tied to legal owners. (iv) *Rural banks* are established to cater to the needs of rural communities, normally owned by their members, and enjoying certain flexibility in determining interest rate on savings, deposits, and lending (Zeller and Johannsen, 2008); and other MFIs. (v) *Non-bank financial institutions* (NBFIs) may have lower capital requirements and limitations on financial services offerings (Servin et al., 2012; Gupta et al., 2013; Mix Market, 2016), with pension funds, insurance companies, and pawn shops being among examples for this category. To further explore the effects of gender composition of management teams across different legal forms of MFI, this study introduces an interaction term between the fraction of women managers and legal form of MFIs. MFI financial structure variables include assets, equity (shareholders' funds), borrowings (which can include both commercial and concessional loans), and deposits (both voluntary and compulsory), representing different sources of MFIs' finance.

In addition, this study introduces a number of control variables, normally considered by the relevant literature. These include size of organisation (Hartarska & Nadolnyak, 2007; Mersland et al., 2011; Pati, 2012; Ashraf et al., 2014), region (Meyer, 2002; D'Espallier et al., 2013; Girón, 2015; Bayai and Ikhide, 2016), as well as key macroeconomic indicators such as GDP, population density, women population, and inflation (see Table 1 for further details).

2.4 Empirical results

2.4.1 Descriptive Statistics

As indicated in Figure 1, the pattern of microfinance lending for women by type of institution was relatively stable over 2005 until 2015. It is NGOs that were leading the way, with women's share among their borrowers being consistently higher compared to that of other types of microfinance institutions, even despite recording its decline from 78.9% in 2005 to 74.4% in 2015. Microfinance banks and cooperatives were among institutions with the smallest share of women borrowers. For both types of institution, it was fluctuating around 50%, with microfinance banks consistently supporting more men than women starting from 2010 (which coincided with the end of the global financial crisis). Non-banking financial institutions were consistently positioned above microfinance banks and cooperatives but below NGOs, with women's share among their borrowers was around 60% for most of the period, reaching its highest value (63.4%) in 2015. It is only for rural banks, one can observe a noticeable change in their relative position as microfinance lenders for women, from being one of the least supportive of women borrowers in the mid- and late 2000s to gradually increasing the fraction of women borrowers after 2008, to approach the women outreach values close to those achieved by NGOs.

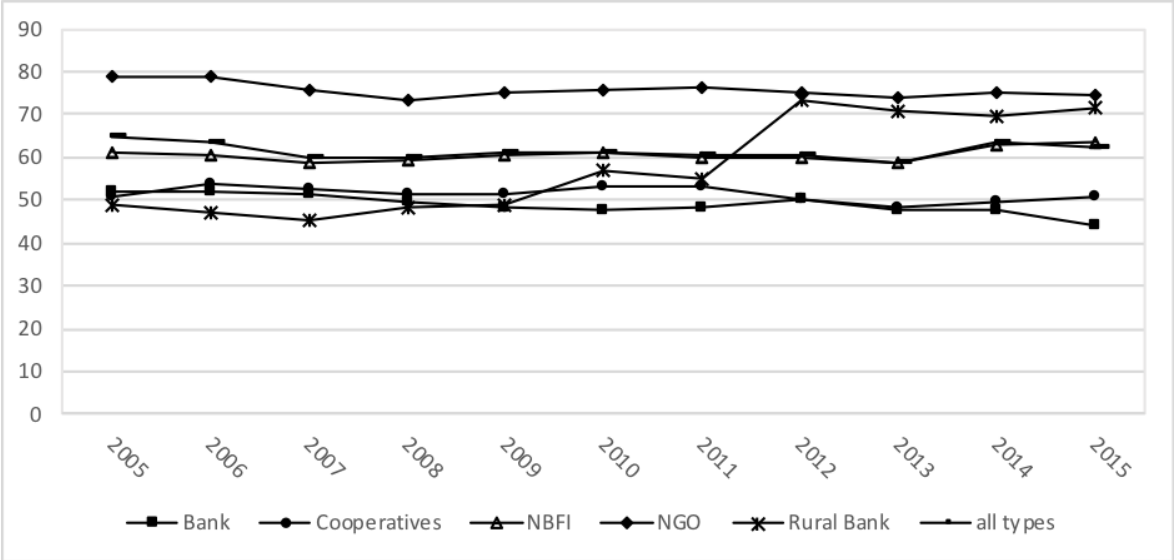

Figure 1 Percentage of Women Borrowers by Type of Institution

The data also indicate some consistency of relative regional patterns of microfinance support for women. The South Asian region consistently records the highest fraction of women borrowers through the 2005 to 2015 period; fluctuating around 84%. By contrast, the Eastern Europe and Central Asian region consistently demonstrates the lowest percentages of women borrowers, declining from 49.2% in 2005 to 39.1% in 2015. The Middle East and North African Region, the Sub-Saharan Africa Region and Latin American and Caribbean Region also record a decline in the fraction of women borrowers, moving from the within 60% to 70% band in between 45% and 55%. The only region where one can observe a noticeable increase in the number of women clients of microfinance institutions, from 67.9% in 2005 to 73.1% in 2015, is the East Asia and Pacific region. To unpack and understand the driving factors behind these patterns, this study now moves on to present the regression results.

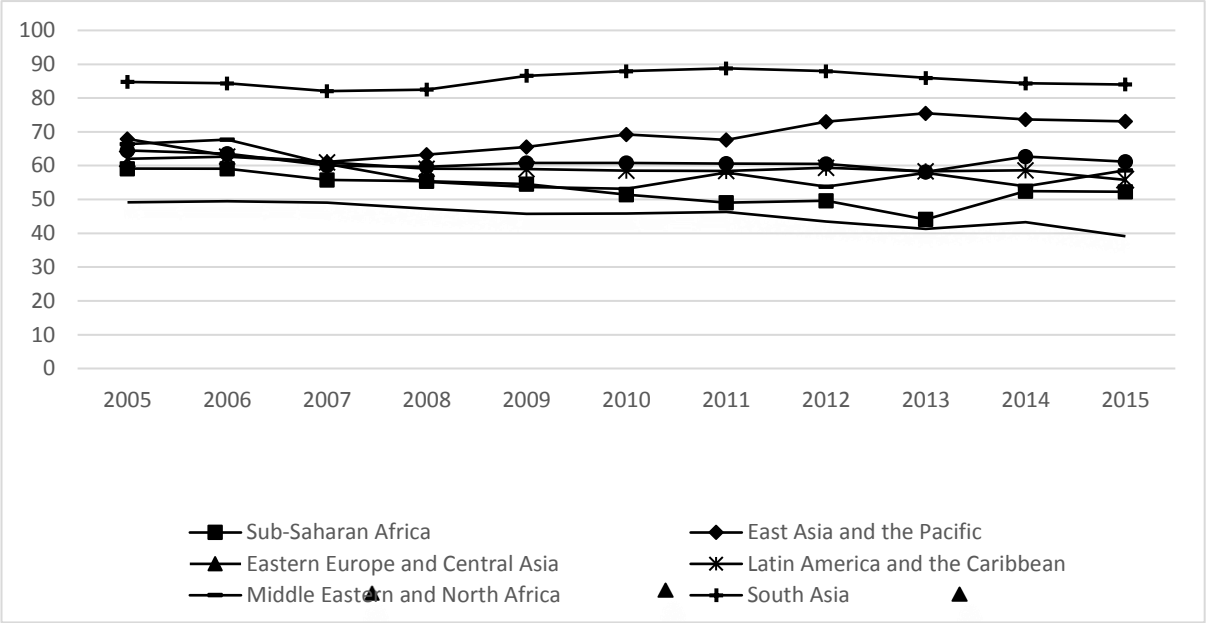

Figure 2 Percentage of women borrowers by region

2.4.2 Regression Analysis

Gender of management and organisational legal form

The results of regression analysis are reported for the global data (Table 2) and its regional subsets (Table 3). Consistent with Hypothesis 1, this study finds a positive and significant relationship between the extent of women representation within management teams of MFIs and the proportion of women entrepreneurs among MFI borrowers. While supporting previous literature insights on the role of women leadership in reaching out to women (Hartarska et al., 2014; Damme et al., 2016; Strøm et al., 2016; Thrikawala et al., 2016), the results reveal a delicate relationship between broader human resource policy, aimed at enhanced women representation across all management function of MFIs, and their social impact. This relationship is evident globally and regionally across institutions operating in the Eastern Europe and Central Asia (EECA), Latin America and the Caribbean (LAC), and the Middle East and North Africa (MENA) regions.

This study also finds that the effects of women managers on women outreach can be more prevalent for certain types of MFI legal form. As indicated by the coefficients for interaction terms in the global picture, the positive effects of women managers are more likely to be significantly enhanced in the case of NGOs, microfinance banks and cooperatives as opposed to that for other non-banking institutions. Unlike NGOs, however, microfinance banks and cooperatives remain among institutions which are associated with a significantly lower proportion of women borrowers (as compared to non-banking institutions). The results are generally supportive of Hypothesis 2 in relation to the role of NGOs. They also indicate that other non-banking financial institutions are associated with significantly higher proportion of women entrepreneur among women borrowers compared to most of other types of MFI.

Regional models provide a more nuanced picture on legal form and interaction term effects. For instance, in South Asia it is rural banks which are associated with a significantly higher proportion of women entrepreneurs as compared to non-banking institutions; yet, the positive effects of women managers are particularly strong in the case of microfinance banks and NGOs. In most regions, it is in NGOs where the positive effects of women managers on women outreach are significantly higher compared to the reference category.

Table 2 Regression results: Global model

	(OLS)	(Fractional logit)
Variables	Women outreach	Women outreach

Women managers	0.071***	0.377***
	(0.015)	(0.075)
Legal form: MFI-bank	-0.138***	-0.674***
	(0.018)	(0.089)
Legal form: Cooperative	-0.083***	-0.365***
	(0.012)	(0.056)
Legal form: NGO	0.0244***	0.160***
	(0.009)	(0.051)
Legal form: Rural bank	-0.176***	-0.867***
	(0.023)	(0.101)
[+]Legal form: NBFI		
Women managers*MFI-bank	0.218***	0.989***
	(0.038)	(0.185)
Women managers*Cooperative	0.060**	0.234**
	(0.025)	(0.114)
Women managers*NGO	0.058***	0.321***
	(0.020)	(0.111)
Women managers*Rural bank	0.079	0.272
	(0.062)	(0.274)
Target market: Low-end	0.196***	0.939***
	(0.006)	(0.031)
Target market: High-end	-0.105***	-0.415***
	(0.008)	(0.036)
[+]Target market: Broad-end		
Financial structure: Assets	-0.014***	-0.052***

	(0.004)	(0.019)
Financial structure: Equity	-0.003	-0.031**
	(0.003)	(0.015)
Financial structure: Borrowings	0.003***	0.015***
	(0.001)	(0.002)
Financial structure: Deposits	0.002***	0.013***
	(0.001)	(0.002)
MFI size	0.019***	0.102***
	(0.003)	(0.017)
GDP	-0.046***	-0.219***
	(0.004)	(0.021)
Population density	-0.006**	0.003
	(0.003)	(0.013)
Women's population share	0.054***	0.268***
	(0.005)	(0.027)
Inflation	-0.001*	-0.006**
	(0.001)	(0.003)
East Asia and Pacific	0.102***	0.499***
	(0.010)	(0.049)
Eastern Europe and Central Asia	0.010	0.140***
	(0.011)	(0.050)
Latin America and The Caribbean	0.056***	0.265***
	(0.010)	(0.046)
Middle East and North Africa	0.006	0.007
	(0.014)	(0.067)
South Asia	0.162***	0.967***
	(0.012)	(0.069)
[+]Sub-Saharan Africa		

Year	Yes	Yes
Constant	0.932***	1.630***
	(0.045)	(0.229)
Observations	9,422	9,422
R-squared	0.433	

Notes:

* p<0.1; ** p<0.05; *** p<0.01. Standard errors are in parentheses.

[+] Denotes reference category.

Target lending market and financial structure

In line with Hypothesis 3, this study finds a significant relationship between the target lending market of MFIs and their outreach to women. MFIs that prioritise clients who are capable of serving large loans are associated with significantly smaller proportion of women compared to MFIs prioritising borrowers who can afford medium-size loans. Conversely, MFIs targeting less affluent borrowers are attracting a higher proportion of women than other types of MFIs are. This picture is consistent at both global and regional levels, indicating the presence of a delicate balance which MFIs must strike in order to achieve both social and financial targets when designing their lending strategy.

Analysis of financial structure coefficients provides further insights into trade-offs and complementarities between financial strategies and outreach performance of MFIs. Both global and regional models confirm that self-sufficiency strategies represented by MFIs with relatively high dependence on assets as their source of finance are more likely to result in a more limited outreach to women (Hypothesis 4a). However, once external sources of finance

are targeted and brought in, MFIs appear to be more supportive of women entrepreneurs. As discussed above this may be due to certain conditions imposed by creditors as well as an increased flexibility to secure collateral or reduce the cost of the loan when lending to women entrepreneurs. In this regard, this study provides general support for Hypotheses 4c and 4d. As for MFI reliance on equity finance (Hypothesis 4b), this result indicates that shareholders do affect women outreach, but this can be in either direction.

Table 3 Fractional logit regression by region

Variables	Sub-Saharan Africa	East Asia and Pacific	Eastern Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia
Women managers	-0.267	0.193	0.719***	0.257*	1.416**	-0.017
	(0.204)	(0.241)	(0.122)	(0.136)	(0.565)	(0.301)
Legal form: MFI-bank	-0.215*	-0.928***	-0.421***	0.123	-0.390	-2.100***
	(0.126)	(0.351)	(0.125)	(0.141)	(0.543)	(0.277)
Legal form: Cooperative	-0.750***	-1.228***	0.191**	-0.278***	-	-0.698***
	(0.124)	(0.368)	(0.080)	(0.095)		(0.252)
Legal form: NGO	0.489***	-0.345*	0.152	0.040	0.395	-0.980***
	(0.112)	(0.199)	(0.313)	(0.084)	(0.271)	(0.171)
Legal form: Rural bank	-0.309**	-2.112***	-	-	-	1.717***
	(0.134)	(0.209)				(0.470)
Legal form: NBFI[+]						
Women managers* MFI-bank	0.760**	0.865	0.118	-0.123	-6.857***	7.872***
	(0.319)	(1.126)	(0.276)	(0.288)	(1.363)	(1.479)
Women managers* Cooperative	1.522***	1.190*	-0.576***	0.216	-	0.315
	(0.299)	(0.704)	(0.146)	(0.193)		(0.519)

Women managers* NGO	1.008***	1.056***	1.538***	-0.022	-0.552	1.821***
	(0.287)	(0.374)	(0.592)	(0.180)	(0.586)	(0.492)
Women managers* Rural bank	-0.153	1.705***	-	-	-	1.738
	(0.563)	(0.430)				(3.424)
Target market: Low-end	0.618***	0.909***	0.641***	1.045***	1.057***	0.786***
	(0.069)	(0.099)	(0.061)	(0.042)	(0.110)	(0.134)
Target market: High-end	-0.412***	-0.758***	-0.332***	-0.424***	-1.318***	-0.421*
	(0.070)	(0.137)	(0.053)	(0.057)	(0.299)	(0.255)
Target market: Broad-end[+]						
Financial structure: Assets	-0.008	-0.088	-0.023	-0.118***	-0.211***	-0.278***
	(0.039)	(0.080)	(0.029)	(0.031)	(0.070)	(0.093)
Financial structure: Equity	0.084***	-0.020	-0.004	0.060**	0.156**	-0.208***
	(0.026)	(0.067)	(0.018)	(0.026)	(0.062)	(0.080)
Financial structure: Borrowings	0.007	-0.018**	0.006	0.019***	0.061***	0.063***
	(0.005)	(0.008)	(0.005)	(0.004)	(0.010)	(0.011)
Financial structure: Deposits	-0.002	-0.006	0.007*	0.006**	0.079***	-0.007
	(0.006)	(0.009)	(0.004)	(0.003)	(0.022)	(0.009)

MFI size	-0.072*	0.287***	0.094***	0.031	-0.007	0.313***
	(0.040)	(0.066)	(0.033)	(0.027)	(0.061)	(0.069)
GDP	0.087*	-0.156	-0.212***	-0.519***	-1.146***	-0.867***
	(0.045)	(0.147)	(0.032)	(0.037)	(0.207)	(0.146)
Population density	-0.051	0.713***	-0.283***	0.136***	-0.389***	0.678***
	(0.033)	(0.082)	(0.024)	(0.020)	(0.099)	(0.104)
Women's population	-0.199***	-0.105	0.251***	0.651***	0.682***	1.024***
	(0.061)	(0.208)	(0.045)	(0.053)	(0.157)	(0.147)
Inflation	-0.001	-0.005	-0.015**	-0.002	-0.003	-0.030**
	(0.006)	(0.010)	(0.007)	(0.006)	(0.010)	(0.013)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.902	4.374***	2.107***	2.545***	18.44***	6.760***
	(0.713)	(0.713)	(0.435)	(0.442)	(3.006)	(1.156)
Observations	1,701	1,155	1,526	3,032	412	1,596

Notes:

* p<0.1; ** p<0.05; *** p<0.01. Standard errors are in parentheses.

[+] Denotes reference category.

- indicates missing reported legal forms of MFIs in each regional dataset

2.5 Conclusions

While there is an increasing interest in the gender issues in microfinance, the relevant literature tends to focus on a relatively narrow agenda such as repayment records of women and their implications for MFI financial performance (Godquin, 2004; Armendariz and Morduch, 2005; D'Espallier et al., 2011, 2013). As the MFI literature grows, it also provides evidence on a variety of institutional forms of MFIs and related lending practices concerning women (Johnson, 2000). Yet, very little is known about organisational drivers of MFI outreach to women entrepreneurs, particularly in global and regional contexts (D'Espallier et al., 2013). This chapter directly addresses this gap by developing a set of hypotheses specifically related to the relationship between different aspects of organisational characteristics and strategies of MFIs (such as human resource composition, legal status, chosen lending targets, and sources of finance) and the extent to which MFIs outreach to women entrepreneurs. To be able to test these hypotheses at both global and regional levels, we used a large international dataset covering 2,330 MFIs across 116 countries from 2005 to 2015.

The results obtained have important theoretical and practical implications. First, this study finds a significant relationship between organisational human resource policy and MFIs outreach to women. These findings extend the previous literature by emphasising the role of gender composition across all management functions within MFIs (and not only that of selected management roles) as an important intra-organisational mechanism for enhancing MFIs' outreach to women. This study also finds that the effects of MFIs' human resource policy on women outreach can significantly vary depending on the legal form of the MFIs. This study concludes that an increasing proportion of women across all MFIs' management

roles makes a particularly significant difference for women outreach of not only NGOs but also more commercial and regulated MFIs such as banks and cooperatives. These results may partially alleviate certain fears in relation to commercialisation of the MFI sector, and provide regulators and self-regulatory bodies with a relatively straightforward recipe to improve social impact through intra-organisational human resource guidelines.

Second, this study observes strong effects of market segmentation on outreach to women entrepreneurs. Microfinance institutions prioritising large and medium size loans in their lending activities are attracting a significantly smaller proportion of women entrepreneurs among their borrowers. While consistent with the previous literature, this finding appears to be alarming as this study document it in relation to every single region in question. This can imply the presence of widespread societal issues related to women's access to capital as well as a lack of broader economic and entrepreneurial opportunities available to women.

Third, based on both global and regional data analysis, this study finds that MFIs driven by considerations of financial self-sufficiency and mainly relying on their assets as a source of funding are significantly less friendly towards women borrowers. Conversely, as evidenced by the global data, MFIs relying more on alternative or additional sources of finance such as debt, and deposit taking tend to support a significantly larger proportion of women entrepreneur. While on a regional level, this study can observe some deviation from this global pattern, in general the findings imply that institutions pursuing less conservative and more innovative financial and lending strategy are more likely to outreach to women, which should also be of practical interest to financial authorities and policy makers concerned with the social impact of the microfinance sector.

Combined, the results provide important insights into gender bias of MFI management and financial structures, both globally and across major world regions. They reveal a set of specific organisational channels and forms through which MFI outreach to women entrepreneur can be enhanced and reinforced. By doing so, they also help set out future research agenda which could be about further unpacking and understanding how exactly these channels and forms operate, evolve, and react in response to relevant organisational and policy interventions across different regulative, normative, and cultural settings.

Chapter 3 The Impact of Financial Structure on MFIs' outreach

Abstract

This chapter analyses different types of MFIs' social outreach performance from panel data of 2,330 MFIs worldwide from the year 2005 to 2015. While using MFIs' financial structure as their main characteristics, this chapter investigates how each funding instrument in the MFI's balance sheet (assets, equity, borrowing and deposit) impacts upon MFIs' social mission in reaching the poor. The results are alarming as this study find that MFIs prefer conservative lending strategies such as assets, reaching many borrowers (breadth of outreach) through the massive quantity of loan they offer (scope of outreach by loan) but have a negative impact on the depth of outreach by focusing on more affluent clients that can absorb large loan size. Moreover, the findings reveal that the exposure of external sources leads to MFIs benefiting economies of scope, as they are utilising a variety of products (loan portfolio and deposits account). However, the result is concerning as they increase the interest rate above the market price. Acknowledging that high-interest rate benefits the deposit to enjoy dividend, however, this gives high costs to the poor, reducing the worthiness of the loan.

3.1 Introduction

Poverty alleviation is the biggest challenge in every nation, particularly among developing countries. The poverty gap can be addressed through microfinance by offering financial support for underprivileged people. Microfinance provides the platform for the poor to start up small businesses and foster entrepreneurial opportunity in the form of financial capital

for microfinance borrowers to enhance venture outcomes and gain benefit from the capital market (Newman et al., 2017). Literature critically debates the issues of mission drift or the emergence of the trade-off between outreach to the poor (social) and profitability (financial) of MFIs (Cull et al., 2007; Hermes et al., 2011; Adhikary and Papachritou, 2014). As MFIs carry double objectives (social and financial), it is challenging for them to be successful in extending loans to the poor, while at the same time able to cover the costs for being financially sustainable in the long run (Khan et al., 2020). Therefore, MFIs need to scale up and gather financial capital through a variety of channels because the sources of fund chosen by MFIs determine the health of the microfinance industry and its societal impacts (Zhao and Lounsbury, 2016).

As an extension from the second chapter on MFIs' outreach to women, this third chapter focuses more on the broader aspects of outreach. This study uses one of the crucial MFIs' organisational characteristics, which is the financial structure, to determine the impact of each financial instrument on different types of outreach dimensions. The reason for this choice is that the composition of funding sources influences the cost of capital, contributes to the cost of lending, and ultimately gives an impact on the borrowers (Titman and Wessels, 1998; Pati, 2014). The financial structure is strongly associated with the financial theory where the financing decision is critical for firm valuation and leads the policymakers to develop the financial structure that best accommodates their business risk (Scott, 1972). In microfinance, financial structure plays a significant role in outreach to the poor, as funding instruments influence the institutions' financial services to the poor and their profitability status in reaching financial stability.

Although the extant research sheds light on the impacts of financial structure on outreach (Kyereboah-Coleman, 2007; Bogan, 2012; Adhikary and Papachristou, 2014), however, there are minimal studies that are focusing on the impacts of financial structure on different types of outreach. Several studies (Tchuigoua, 2015; Pati, 2014) have been conducted the opposite angle where the financial structure is as an outcome of the investigation on its impact on outreach. Prior studies (Anduanbessa, 2009; Pati, 2012; Adhikary and Papachristou, 2014; Ashraf et al., 2014; Bechetti and Pisani, 2015) also overlook the importance of evaluating MFIs' outreach by examining the impact of the financial performance of MFIs on outreach, with the justification to see whether MFIs that carry out welfare missions are financially stable enough to survive as financial institutions. Besides, most of the literature focuses on two essential aspects of outreach which are *breadth* and *depth* (Bogan, 2012; Pati, 2014; Johnson, 2015). Therefore, this study makes a novel contribution by bridging the gap on analysing different types of outreach performance (breadth of outreach, depth of outreach, the cost to users, length of outreach, scope of outreach by deposits, and scope of outreach by loan).

By using panel data of 2,330 MFIs worldwide from 2005 to 2015, the results are alarming as this study find MFIs with a high dependency on assets reaching many borrowers (breadth of outreach) through a massive quantity of loan (scope of outreach by loan) but having a negative impact on the depth of outreach by focusing on more affluent clients that can absorb large loan size. Additionally, this study finds MFIs with high reliance on assets have higher portfolio quality, which indirectly creates less waiting time for their borrowers on the list to get their loans approved. On the other hand, this study finds it concerning that a MFI's reliance on commercial borrowing pursues financial sustainability by charging a high interest rate and receiving a massive quantity of deposits alongside its high loan portfolio. Despite the reasoning that high interest rate charges are imposed to bear high costs and

extraction from a premium from loan advances is to pay the commercial debt (Kyereboah-Coleman, 2007; Ghosh and Tassel, 2011; Hetland, 2011), this indirectly tells MFIs to give loans of lower worth to the borrower as they need to pay a high-interest rate. The findings shed further insight into relying on external sources; for example, commercial borrowing might validate the negative impacts of commercialisation on outreach performance of MFIs. This study also finds that MFIs that enter the commercial market to raise external funding through borrowing from other financial institutions enjoy economies of scope by increasing the number of their products (deposit account and loan). Moreover, this study finds it alarming that MFIs with high dependence on deposit as a source of financing seem to forgo their social objectives as they raise interest rates above the market line and tend to target wealthier clients that can provide a large number of deposits. Even though MFIs will gain the advantage of liquidation purposes in the case of loan losses (Berlin and Mester, 1999; Hetland, 2011), there is still the possibility of the presence of trade-off or mission drift when MFIs rely solely on external financing.

The structure of this chapter is as follows. Section 2 provides the conceptual framework to measure MFIs' outreach and the link between financial structure and outreach, as well as the hypotheses development. Section 3 describes data involved in this chapter, explaining the estimation methodology, model used and selection of variables. Section 4 provides a discussion on how each financial structure has an impact on all five aspects of outreach. Section 5 concludes this chapter and states the limitations and suggestions for future research.

3.2 Microfinance Characteristics: The link between financial structure and outreach

3.2.1 The Context

Microfinance or micro-lending creates a fulcrum for the development of poor people's lives, as the loan borrowed is invested into small businesses, provides much needed services to the community by building infrastructure, and creates new jobs for them (Dokmo and Reed, 1998). Most of the microloan borrowers in low-income countries consist of less educated and unskilled workers, capable of managing small trade markets, shops, and owning land after using microfinance (Sultakeev et al., 2018).

Formal traditional financial institutions, particularly conventional banks, find that asymmetric information on the potential borrower poses a hindrance to their lending to the poor, thus meaning they have to raise the interest rates for the high transaction costs involved in serving small loans with no reliable, secure collateral (de Aghion and Morduch, 2005). The informal source of fund undertakes to fulfil this financial gap. However, limited existing resources with excessive interest rate charges also make informal funding unavailable for the poor (de Aghion and Morduch, 2005). Microfinance institutions (MFIs) therefore fill this finance gap by introducing easier access to loans with small collateral, offering small-sized loans that satisfy the needs of the poor. Therefore, poverty eradication, particularly within developing countries, has become the main aim of Microfinance institutions in order to achieve substantial outreach. Thus, in order to offer small loans to more people, microcredit institutions need to raise the capital by opening more channels for private capital to flow (Dokmo and Reed, 1998).

The most attractive source of capital fund is debt financing (borrowings from DFIs and other financial institutions) as it is attractive to both owners and issuers by providing a steady source of income for owners and stable source of fund for issuers (Hishigsuren, 2006; Pati, 2014). Some MFIs prefer using equity as a source of the fund compared to debt, to attract potential commercial investors as higher earnings per share, give a signal that firm is the risk-taker, capable of managing invested money and at the same time generating profit for the institutions. Nowadays, institutions are more likely to depend on deposits and savings because these represent low-cost funding and independence from external funding (Bogan, 2012). Also, institutions – particularly banks with greater access to core deposit – allowed them to insulate bank-dependent borrowers from credit shocks (Berlin and Mester, 1998), which makes deposits and savings a convenient source of financing to MFIs.

However, MFIs face a challenge in their growth and innovations in reaching the poor, due to the funding constraints and limited access to the capital market and personal investors (Mia et al., 2020). Therefore, there is a need to explore the financial structure of MFIs as a fundamental aspect in determining the social performance of MFIs. To date, only a few studies cover the bridge between financial structure and MFIs' outreach. The closest study is by Bogan (2012), who explored how changes in capital structure could improve MFI efficiency and financial sustainability, find that grants as a percentage of assets are negatively related to the percentage of impoverished borrowers. However, her study does not cover comprehensive aspects of outreach, a gap which this research addresses. This study examines different types of outreach (breadth, depth, costs to users, length and scope of outreach). This study also investigates the relationship between each of the funding instruments and outreach by using a financial structure as MFIs characteristics in determining their impact on outreach performance. Besides, her study only covers the year of 2003 and 2006, while this study involves 10 years period (2005-2015).

Another study is by Annim (2012), who investigated the impact of using financial resources in reaching the poor (who are mainly involved in the agriculture business) on the operational and financial performance of MFIs in Ghana. Her result suggested that MFIs that dispense their fund reach non-poor clients with a high-interest rate, while MFIs that are only operationally self-sufficient reach more financially-constraints clients. However, the author only involves cross country analysis, while this study involves richer database consisting of six regions (Sub-Saharan Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, and South Asia). Besides, her research is focusing on determining the impact of microfinance on the lives of the poor households, while the focus of this chapter is examining the impact of funding instruments of MFIs financial structure on different types of outreach –outreach to women, breadth of outreach, depth of outreach, costs to users (worth of outreach), length of outreach, the scope of outreach by deposit, and the scope of outreach by loan.

3.2.2 The Conceptual Framework

Following the guidelines of Navajas et al., (2000); Schreiner (2002), Woller and Schreiner (2004) and Woller (2006) for the outreach framework (refer table 4), this study construct six aspects of the outreach of MFIs; these are breadth of outreach, depth of outreach, cost to users, length of outreach, scope of outreach by deposits, and scope of outreach by loan.

The number of clients or borrowers measures the *breadth of outreach* served by MFIs, following the theoretical framework of MFIs' social worth by Navajas et al., (2000) and Schreiner (2002) The *depth of outreach* is defined as the value society attaches to the net

gain from the use of microfinance and is measured by loan size (Navajas et al., 2000; Schreiner 2002). Using loan size to measure depth has drawn much criticism because the loan size increases as a result of expansion outreach. Nonetheless, Schreiner (2001) emphasised that greater loan size benefits lenders regarding profitability, but offers less depth of outreach to the poor as they are unable to guarantee their credit-worthiness in exchange for the large loan applied. In this study, all independent variables are expected to have negative signs with loan size, as low loan size offered is preferable for meeting the needs of the most impoverished.

The *cost of outreach* (the cost to users) involves the sum of price costs and transaction costs (Navajas et al., 2000; Schreiner 2002). This study proposes to measure cost and worth using the same proxy, nominal yield, which represents the interest rate charges MFIs impose on borrowers. This study suggests nominal yield on the gross portfolio as financial indicators, as suggested by Woller (2006) and Lepetit and Nzongang (2014) for the cost of outreach to the users. The interest rate represents the minimum cost that the borrower needs to pay for the loan. Thus, logically, if the interest rate paid by the borrower is lower than the market price, it will give more worth of loan to the borrower. This study argue that it is difficult to measure how much the borrower is willing to pay in financial terms as suggested by Navajas et al., (2000) and Schreienr, 2002). This study believes the lesser the cost borrower pays for the loan, the worthier the loan to the borrower. This argument supported by Kar (2011) on the willingness of the poor to repay the loan at a low interest rate.

Navajas et al., (2000) and Schreiner (2002) described the *length of outreach* as the time frame within which MFIs produce loans, and they suggested profit and sustainability as measurements. The justification is that more extended outreach through sustainability

usually strengthens the structures of incentives that serve to maximise expected social value less social cost discounted through time. However, Woller (2006) suggested that one of the measurements of length is portfolio at risk more than 30 days (PAR30), defined as an outstanding balance of all loans that have amount overdue (Ledgerwood, 1998). The higher ratio of a portfolio at risk represents a higher delinquency rate, in which a repayment from borrowers is delayed. It will delay the time to produce new loans as, logically, repayment from existing borrowers will stimulate new loan for potential borrowers. It also means it will lead to a longer waiting period for the next borrower to get their loan disbursement. Therefore, this study uses this ratio, *portfolio at risk more than 30 days (PAR30),* showing the size of a sound loan portfolio, which is the minimum period to produce loan by institutions after deducting the percentage of the loan outstanding by current borrowers. This is supported by Adair and Beguiga (2014), where the loan is less likely to reimbursed when more portfolio is affected by delayed on payback over 30 days.

The *scope of outreach* is the number of types of financial contracts offered by MFIs where, in practice, MFIs with the best outreach produce both large quantities of small loans and receive small deposits (Navajas et al., 2000; Schreiner 2002; Woller and Schreiner, 2004). In this chapter, we propose scope of outreach by deposits and scope of outreach by loan. Deposits and loans are expected to have an inverse relationship with each other, meaning the demand for a loan will decrease if the demand for deposits increases with respect to the interest rate of the loan. Hossain et al., (2013) and Mashamba et al., (2014) claimed that high-interest rate decreased loan demand, resulting from a high demand for a deposit because of interest benefit. For greater outreach, MFIs are supposed to offer a small deposit and large loans portfolio to the poor.

Table 4 Conceptual framework by prior scholars

Author and Year	Period, Data Collection	Theory	Variables for Outreach
Ledgerwood (1998)	-	-	*Scale of outreach:* Number of clients served. *Depth of outreach*: Types of clients served.
Navajas, S., Schreiner, M., Meyer, R. L. Gonzalez-Vega, C. and Rodriguez-Meza, J. (2000)	1995 (November and December),La Paz, Bolivia; 1987-1996	Theory of Social welfare	*Depth of outreach*: Value that society attaches to the net gain from the use of microcredit by a given borrower. *Worth to users*: How much a borrower is willing to pay for a loan. Depends on loan contracts, taste, constraints, and opportunities available to the user. *Cost to users*: The cost of a loan to a borrower. Includes the sum of price costs and transaction costs (internal rate of return and miles, minutes and money required to use financial service). *Breadth of outreach*: Number of users. *Length of outreach*: Time frame in which a microfinance organisation produces loans. Includes longer sustainability, small ratio in loan losses, higher profit. *Scope of outreach*: The number of types of financial contracts offered by a microfinance organisation (small loans and small deposits).

Schreiner (2002)	Banco Sol, Bolivia; 1987-1996	Welfare Theory	*Worth of outreach to clients*: Their willingness to pay (lower bound on worth is the increase in business profits). *Cost of outreach to clients*: The sum of price costs and transaction costs (the best measure of price costs is the internal rate of return). *Depth of outreach*: The value that society attaches to the net gain of a given client such as loan size, average amount outstanding of borrowed purchasing power, gender, location, education, ethnicity, housing, access to public service. *Breadth of outreach*: Number of clients. *Length of outreach*: The time frame of the supply of microfinance such as profits. *Scope of outreach*: The number of types of financial contracts supplied such as loans and savings services.
Woller and Schreiner (2004)	n/a	Benefit-Cost Frame-work	Worth: retention/exit rate, and yield of MFIs. Costs: Interest rate charged (as proxy by the portfolio yield), fees and commissions paid. Scope: The number and types of different loan, savings, and different voluntary non- financial service offered. Depth: Loan size. Breadth: Optimal leverage. Length: Sustainability (Financial and Operational self-sufficiency ratios), and number of years of MFI's operation.

Woller (2006)	n/a	Benefit-Cost Frame-work	*Breadth*: 1. Number of borrowers. 2. Clients with non-enterprise loans as a percentage of borrowers. 3. Voluntary savers as a percent-age of borrowers. 4. Clients with other financial services as a percentage of borrowers. 5. Clients with non-financial services as a percentage of borrowers. *Depth*: 1. Average loan size as to GNI per capita. 2. Percentage of female clients. 3. Percentage of rural clients. 4. Percentage of enterprise loan clients selected with direct poverty-targeting tools. *Length*: 1. Profit margin. 2. Return on equity. 3. Return on assets. 4. Portfolio at risk > 30 days.

			5. Operating expense relative to average loan portfolio. *Scope*: 1. Number of distinct enterprise loan products. 2. Number of distinct other loan products. 3. Number of other financial services. 4. Type of savings offered. 5. Percentage of clients with three or more products or services. *Cost*: 1. Real yield on average gross loan portfolio. 2. Nominal yield on average gross portfolio. 3. Weighted average number of days to approve and disburse loans after completion of loan application. 4. Percentage of loan clients providing non-traditional collateral. 5. Percentage of enterprise loan clients who loan officers visit for regular financial transactions. *Worth:* 1. Loan loss rate. 2. Client retention rate. 3. Share of two-year clients still with the programme.

			4. Share of portfolio growth attributable to existing clients. 5. Type of market research con-ducted. *Outreach to the community*: 1. Percentage of operating revenues reinvested back into the community. 2. Percentage of employees that have left the firm not including pension leaves and deaths. 3. Female-male employee ratio among professional-level staff. 4. Percentage of employees receiving at least two days of training. 5. Formal internal CSR policy. 6. Formal codes of conduct governing actions towards employees and clients. 7. Formal access to management. 8. Health insurance for full-time employees. 9. Credit life insurance for borrowers. 10. Disclosure of effective interest rate on all loans.

3.2.3 Hypotheses

Hypotheses developed under this section involve the impact of each financing instrument in the MFI's balance sheet, which are assets, equity, borrowings and deposits, on outreach, specifically to identify how well the MFI uses these sources of financing on outreach in order to fulfil their duty on reducing poverty among the poor, while at the same time being able to generate profit for their financial viability.

(a) Asset Financing and Outreach

Total assets in this chapter involve both tangible and intangible assets. Leary and Roberts (2005) highlighted that institutions with high cash balances prefer less to use external financing compared to institutions with significant anticipated investment expenses. According to de Sousa-Shield and Miamidian (2004), social investors view MFIs with high numbers of borrowers as strong financial institutions; hence they allocate a vast amount of capital for investment. This later can be used as an investment in their assets as primary financing. Findings by Hartarska and Nadolnyak (2007) and Bassem (2009) support this study arguments where an increase in MFIs assets also increases the number of borrowers. Based on the literature, therefore, it is expected MFIs that use capital investment on assets have increased the number of borrowers, with the assumption that they are efficiently using assets to reach the poor. This generates the following hypothesis:

Hypothesis 1a: MFIs with a high level of assets have a positive impact on breadth of outreach.

Ashraf et al., (2014) suggested that MFIs with substantial assets are more experienced and thus more efficient in managing their profitability. When MFIs use assets as their sources of capital, it is expected that those MFIs serve large loan size for financially sustainability It is because disbursing small loan to many customers is high risk and involves high transaction costs. This argument is supported by Omri and Chkoundali (2011), where large loan size causes the creation of surplus for the institutions to fund their future growth. Thus, the following hypothesis is developed:

Hypothesis 1b: MFIs with high level of assets are less focused on the depth of outreach.

According to Beisland and Mersland (2012), MFIs with large assets are profitable, less risky, and more cost-efficient. Tchuigoua (2015) also emphasised that larger MFIs with assets are less risky because they have a more excellent reputation and better risk management. As this study predict in the above hypothesis (hypothesis 1b), these MFIs serve large loan size for cost-saving purposes, indirectly make the loan worthier to the borrower. Therefore, this research expects to find that MFIs charge low-interest rate as this is bearable in larger loan size and indirectly, make the loan worthier to the borrower. Also, some MFIs might get an investment from social investors (de Sousa-Shield and Miamidian, 2004) which leads them to lower the interest rate below the market price due to the low cost involved in providing a loan. Hence, the hypothesis is developed as follows:

Hypothesis 1c: MFIs with high levels of assets provide low cost and worthier loans to the poor.

Yimga (2016) suggested that MFIs which are operationally self-sufficient with higher ability to coordinate and channel funds have consistently higher portfolio quality. High loan

portfolio quality is essential for financial viability (Nwachukwu, 2014). This study expects to find MFIs that are dependent on assets are driven by self-sufficiency for financial sustainability require steady cash flow, avoiding bad loans on books or extending their term through refinancing. Higher portfolio quality makes the loan portfolio less risky, thus, MFIs take less time to process and produce the loan for the borrower. Thus, this study posits:

Hypothesis 1d: MFIs with high level of assets give less waiting time for the next borrower.

Vanroose and D'espallier (2013) analysed the relationship between outreach and performance and found that one of the MFIs' characteristics, assets, are positively correlated with loan portfolio. Thus, this suggests that MFIs with a high level of assets cover MFIs' main scope of outreach by providing an enormous amount of credit supply to the poor. This is a better situation for MFIs to avoid unnecessary risk in managing large deposit and large loan at the same time, as focusing mainly on one of the services is less risky, prevents loan losses, and lead to better sustainability. Thus, this study posits:

Hypothesis 1e: MFIs with high level of assets focus on scope of outreach by loan.

(b) Equity and Outreach

People inside the organisation determine the mission carried out by the organisation, particularly members of boards, as to whether they will pursue financial sustainability by an increase in return earnings or stick with their social mission of reaching the poor. Prior studies investigate the impact of shareholders on MFIs outreach performance. For instance, Bassem (2009) pointed out that a larger board size with unaffiliated directors, together with experienced managers, have better sustainability because they have a broad range of expertise to make the decision. A careful selection of less risky borrowers is vital for

shareholders for the sake of financial profitability. Thus, this study expects to find that MFIs which depend on equity as a significant source of financing reach a smaller number of borrowers. An empirical finding by Hartarska and Nadolnyak (2007) enhances this argument where stakeholder donors who control for availability of equity are reluctant to provide more equity to MFIs with significance breadth of outreach. Thus, this study posits the following hypothesis:

Hypothesis 2a: MFIs with high equity financing have a negative impact on breadth of outreach.

Hoque et al., (2011) stated that MFIs do receive retained earnings from non-profit foundations to build their initial equity base together with grant money. They highlighted that when the debt level reaches their limit, MFIs will raise the sizeable amount in initial public offerings. Thus, this study expects that MFIs with high equity financing offer large loan size to the poor due to the pressure to provide a high return to the shareholders. Larger loan size is more cost-effective for these MFIs as using equity financing requires them to generate profit for the shareholders. Tucker and Miles (2004) also pointed out that offering large loan size enables MFIs to benefit from economies of scope for profit-making businesses. Thus, the following hypothesis is developed:

Hypothesis 2b: MFIs with high equity financing focus less on depth of outreach.

Allen et al., (2015) suggested that equity financing is the most valuable source of funding. Tchuigoua (2016) suggested that MFIs hold a high level of equity as a cushion against loan deterioration, reflecting that their access to bank financing is expensive, leading them to raise interest rate charges to borrowers. Therefore, this study expects MFIs to charge the interest

rate above the market price, in which the interest rate charged by the firm will compensate for the equity financing cost borne by MFIs. This led to the following hypothesis:

Hypothesis 2c: MFIs with high equity financing charge high cost to the poor for financial sustainability.

In using equity financing as the primary source of funding in achieving social objectives, this encouraged MFIs to maintain a strong commitment for monitoring borrowers. It can be achieved through soft-lending methodologies to warrant high repayment performance from borrowers (Tchuigoua, 2016). Sheikh and Wang (2012) suggested that suppliers of a fund such as commercial banks and development of financial institutions favour MFIs with independent directors because of effective monitoring. They also emphasised that directors avoid risk to keep their position intact for good salary and bonuses. Therefore, it is expected that MFIs with high equity have low loan portfolio at risk with the utilisation of technology, which makes the loan process easier. Hence, this study proposes the following hypothesis:

Hypothesis 2d: MFIs with high equity financing provide less waiting time for next borrower.

Hartarska and Nadolnyak (2007) suggested that shareholder donors are willing to provide equity capital to MFIs that do well in lending, emphasising that MFIs with bigger endowments reach more borrowers, as they do not need to adjust their mission to get additional capital. Thus, it is expected that MFIs with high equity financing will serve the large quantity of loan portfolio, to encourage more potential borrowers. Thus, the following hypothesis is developed:

Hypothesis 2e: MFIs with high equity financing focus on scopes of outreach by loan.

(c) Debt Financing and Outreach

Debt financing refers to MFIs' commercial borrowings from other institutions and is an accessible resource as it is less expensive than equity financing and is highly convenient. Adhikary and Papachristou (2014) highlighted that MFIs with commercial viability increase their number of borrowers. Thus, this study predicts that MFIs with high debt financing have high outreach level, particularly by having a large number of borrowers.

Hypothesis 3a: MFIs with high debt financing have a positive impact on breadth of outreach.

An empirical study by Khachatryan et al., (2017) suggested that some of the MFIs loans from other financial institutions consist of subsidised interest and loan by social investors, in which their result shows these types of borrowing positively related with the depth of outreach. Johnson (2015) also points out that dependence on commercial funding does not overshadow outreach objectives. Thus, this study expects MFIs with high reliance on borrowing to offer small loan size to the borrower. The following hypothesis is proposed:

Hypothesis 3b: MFIs with high debt financing are focused on the depth of outreach.

Hetland (2011) revealed a more substantial increase in borrowing is significantly correlated with higher interest paid, showing MFIs that rely on borrowings from other institutions charge the high-interest rate to the borrower. Besides, those MFIs can extract the premium from the loan advance, which can turn into their income flow and profit that later will be used to pay their commercial debt (Kyereboh-Coleman, 2007). Therefore, those MFIs are expected to charge high-interest rate to the poor, due to the high cost of borrowing.

Hypothesis 3c: MFIs with high debt financing reliance provide a high cost to the poor.

In their study on the impact of debt financing on outreach, Mersland and Urgeghe (2013) revealed that accessing commercial debt, particularly from international funds, has a lower portfolio at risk. This is supported by Kyereboah-Coleman (2007) and Sheikh and Wang (2012) emphasised that highly-leveraged and large MFIs should borrow more because of their ability to diversify the risk and ca[ability to deal with moral hazard and adverse selection. Thus, this study predicts that MFIs that rely heavily on debt financing have low risk, giving the borrower less waiting time to get their loan. This is because MFIs with access to commercial debt had steady sales, substantial collateral, and profitable growth, and were well-established, large, and experienced institutions capable of managing credit risk by the poor. Thus, the following hypothesis is formulated:

Hypothesis 3d: MFIs with high debt financing reliance give less waiting time for the next borrower.

MFIs with dependencies on debt financing are expected to accept large deposits and serve a massive quantity of loan to the poor as well. Hartarska and Parmeter (2009) stated that enhanced benefit from providing both loan and savings deposit is mainly achieved by the shared costs in branch infrastructure IT know-how. As MFIs with commercial debt are exposed to commercial market funding, high deposit and loans are an essential strategy for these MFIs to be financially viable. They also can enjoy the economies of scope; by increasing the number of products offered through reduction of the unit costs. Additionally, banks are more willing to lend loan when deposits are protected (Fan et al., 2012). Thus, this study suggests the following hypothesis:

Hypothesis 3e: MFIs with high debt financing focus on scope of outreach by deposit and loan.

(d) Deposit Financing and Outreach

Deposits here are the combination of voluntary deposits and compulsory savings, received by MFIs. Voluntary deposits become MFIs' major sources of fund, applying for MFIs with deposit-taking entitlement because they need to comply with the regulatory and capital requirement to receive deposits. Compulsory savings act as collateral substitutes, which is a mandatory saving for borrowers as a condition to get the loan for default purposes, usually applies to group lending (Ledgerwood, 1999). However, managing deposit and credit are challenging for MFIs due to their nature of helping the poor improve their lives. De Sousa-Shields and Miamidian (2004) emphasised the need to change focus from lending to collecting deposit has proven to be challenging because receiving deposits takes a longer time than expected. Thus, it is expected that MFIs with considerable reliance on deposit-taking have a small number of borrowers, as they are focusing on deposit services. Additionally, these MFIs need to be careful in selecting their borrowers due to the uncertainty of deposit withdrawal, which might affect their loan process. This argument is supported by Hossain et al., (2015) regarding the loan disbursement by banks is affected by liquidity position and strategies, optimum liquidity, and selection of good borrowers. Thus, this study posits:

Hypothesis 4a: MFIs with high deposit financing have a negative impact on breadth outreach.

Besides, MFIs with high deposit reliance to finance daily operations are expected to offer large loan size. Omri and Chkoundali (2011) emphasised that larger loan size creates a surplus for MFIs to fund their future growth. This then can reduce the MFIs' cost of delivering loan services. This is because the larger loan size lowers the average cost (Lebovics et al., 2015), creating more profit for the MFIs. MFIs with access to deposits usually focus more on wealthier clients because they can provide a large amount of deposit to MFIs; thus, MFIs opt to disburse large loan sizes for borrower above the poverty line. Thus, this study suggests the following hypothesis:

Hypothesis 4b: MFIs with high deposit financing focus less on depth of outreach.

It is expected that MFIs with high reliance on the deposit charge high-interest rate to the poor, as high-interest rate gives benefit to the depositor to enjoy high dividend on deposits. Hence, since MFIs with deposit reliance focus on the depositor, then the high-interest rate would favour depositors. Hossain et al., (2013) and Mashamba et al., (2014) supported the finding that interest rate of the loan has an asymmetric effect on deposit because the depositors are willing to save more deposits in banks with the rise of interest rate in order to benefit from the interest. Hence, the hypothesis is developed as follows:

Hypothesis 4c: MFIs with high deposit financing give a high cost to the poor.

According to Bibi et al., (2018), portfolio at risk more than 30 days (PAR30) is expected to be positively related to social performance, perhaps because the lender takes a higher risk in pursuit of social objectives rather than focusing on repayment of the loan. Thus, this study predicts that MFIs with high reliance on deposit as the primary source of financing have a broad portfolio at risks to pursue social performance, but indirectly increase the length of

time frame to produce loan. This means the loan approval period for the next borrower will also get longer. Thus, this study posits:

Hypothesis 4d: MFIs with high deposit give more waiting time for the next borrower.

MFIs with high reliance on deposit-taking are expected to have positive correlations with both deposit and loan. This is because the deposit is the cheapest source of fund and the most liquid form, which makes MFIs focus on collecting deposits as primary funding. Hetland (2011) emphasised that the deposit account creates added value to the institutions where they rely on the depositor when experiencing loan losses. Additionally, large deposits can be used as a cushion for MFIs from credit shocks, allowing an increase in efficient liquidation of assets (Berlin and Mester, 1999). Thus, the following hypothesis is formulated:

Hypothesis 4e: MFIs with high deposit financing focus on scope of outreach by deposit and loan.

3.3 Methodology

3.3.1 Data

This chapter employs a longitudinal study involving secondary data, where the institutions' information databases are collected from the much-exploited database, Microfinance Exchange (MIX) Market, which can be referred to at www.themix.org. It is a data hub that consists of self-reported information on financial such as profitability, revenues, and expenses, social information such as outreach and sustainability; and operational information such as cost efficiency, risk, and liquidity from MFIs around the world since the 1970s. However, it is believed that the same data can be interpreted in different ways, and new

theoretical insight will emerge after analysis. The sample of this study is unbalanced panel data consisting of 2,330 MFIs across six regions – Sub-Saharan Africa, East Asia and Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, and South Asia – from 2005 to 2015. Meanwhile, country macroeconomic variables are collected from the World Bank database.

3.3.2 Method

This study tests the set of hypotheses using fixed-effect with robustness check, after running the Hausman test. Fixed effects regression estimates within-effects, and assumes constant population parameter values, as sampling error variance is constant across the studies (Schmidt et al., 2009). This estimation model is preferable to the Ordinary Least Square (OLS) because the OLS model has a possibility of a parameter to be biased if the supposed omitted variables correlate with other independent variables.

The main goal of the establishments of the MFI is to reach the poor by providing an easy loan to them. Therefore, this chapter appoints *outreach* as a primary dependent variable to identify whether those MFIs achieve their main mission or not. This study proposes six aspects of outreach – breadth, depth, costs to users, length, and scope of outreach by deposit and loan – as discussed in the conceptual section above. This study regress MFIs' outreach with MFIs' *financial structure* as their organisational characteristics consists of assets, equity, borrowings, and deposits, as detailed in Table 5.

Table 5 Variable Definitions and Summary Statistics

Variables	Description	Mean	Std. Deviation	Min	Max
Dependents:					
Breadth of outreach					
Number of active borrowers	Ln; The number of individuals or entities who currently have an outstanding loan balance or are primarily responsible for repaying any portion of the gross loan portfolio. Individuals who have multiple loans with MFIs are counted as single borrower.	8.002	2.781	0	15.916
Depth of outreach					
Average outstanding balance	Ln; Gross loan portfolio divided by number of outstanding loan. Represent the average loan size remaining to be paid.	6.355	1.340	0	16.262
Cost of outreach to users)					
Nominal yield of gross loan portfolio	Financial revenue from loans/average gross loan portfolio. Aids to estimate the MFI's ability to generate revenue from interest, fees, and commissions on the gross loan portfolio. Income from late fees and penalties are also included.	31.900	16.836	0	99.94
Length of outreach					

Portfolio at risk more than 30 days	Ln; [(Outstanding balance portfolio overdue > 30 days + Renegotiated loans)/Gross loan portfolio]. Represents the portion of loans greater than 30 days past due date, including the value of all renegotiated loans (restructured, rescheduled, refinanced and any other revised loans) compared to gross loan portfolio. The most accepted measure of a financial institution's portfolio quality.	1.511	1.001	0	4.615
Scope by deposits					
Number of deposit account	Ln; The number of deposit accounts opened with the institutions to who the balance are to be repaid. The number should be based on the number of individual accounts rather than on the number of groups. This includes accounts such as current / transactional accounts, term accounts, interest bearing accounts, and e-money accounts.	4.207	5.082	0	16.833
Scope by loan					
Gross loan portfolio	Ln; All outstanding principals due for all outstanding client loans. This includes current, delinquent, and renegotiated loans, but not loans that have been written off. It also includes off-balance sheet portfolio.	15.110	2.418	0	24.154
Independents:					

Asset	Ln; Total value of resources controlled by the Financial Service Providers (FSP) as a result of past events and from which future economic benefits are expected to flow to the FSP. For calculation purposes, assets are the sum of each individual asset account listed.	15.488	2.315	0	24.567
Equity financing	Ln; The residual interest in the assets of the financial institution after deducting all its liabilities. For calculation purposes, equity is the sum of each equity account listed, less any distributions.	14.150	2.360	0	22.587
Debt financing	Ln; Total borrowing.	10.660	6.732	0	22.993
Deposit	Ln; The total value of funds placed in an account with the FSP that are payable to a depositor. This includes accounts such as current or transactional accounts, term accounts, interest-bearing accounts, and e-money accounts.	7.300	7.561	0	24.089
Controls:					
Legal form					
MFI-Bank	A licensed financial intermediary regulated by a state banking supervisory agency. It may provide any of a number of financial services, including deposit taking,	0.092	0.289	0	1

	lending, payment services and money transfer. 1 if Yes, otherwise 0.				
Cooperatives	A non-profit, member-based financial intermediary. It may offer a range of financial services, including lending and deposit taking, for the benefit of its members. While not regulated by the state banking supervisory agency, it may come under the supervision of regional or national cooperative councils. 1 if Yes, otherwise 0.	0.172	0.378	0	1
NGOs	An organisation registered as a non-profit for tax purposes or some other legal charter. Its financial services are usually more restricted, so do not include deposit taking. These institutions are typically not regulated by a banking supervisory agency. 1 if Yes, otherwise 0.	0.338	0.473	0	1
Rural banks	Banking institutions that target clients who live and work in non-urban areas and who are generally involved in agricultural-related activities. 1 if Yes, otherwise 0.	0.043	0.205	0	1
Others (including NBFIs and other types of MFIs)	An institution that provide similar services to those of a bank, but is licensed under a separate category. The separate license may be due to lower capital requirements, to limitations on financial service offerings, or to supervision under a different state agency. In some countries this corresponds to a special category created for microfinance institutions.	0.353	0.478	0	1

	1 if Yes, otherwise 0.				
MFI size	Ln; Branches of offices.	2.419	1.309	0	8.432
Macroeconomic					
Gross domestic product	Ln; National income/National output and national expenditure.	25.003	1.995	19.578	30.034
Inflation	Ln; Sum of (Retail Price Index x Weighted Price Index) / Weighted Price Index x 100.	6.918	5.146	-10.067	53.231
Population density	Ln; The total number of people/areas of land (measured in square miles or square kilometres).	4.446	1.168	0.966	7.121
Region					
Sub-Saharan Africa (SSA)	1 if Yes, otherwise 0. Countries included: Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, the Democratic Republic of the Congo, Republic of the Congo, Cote d'Ivoire, Ethiopia, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, and Sierra Leone.	0.207	0.405	0	1
East Asia Pacific (EAP)	1 if Yes, otherwise 0. Countries included: Cambodia, People's Republic of China, East Timor, Fiji, Indonesia, Laos, Malaysia, Myanmar (Burma), Papua New Guinea, the Philippines, Samoa, Solomon Islands, Thailand, Tonga and Vietnam.	0.123	0.328	0	1

East Eastern and Central Asia (EECA)	1 if Yes, otherwise 0. Countries included: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, Kazakhstan, Kosovo, Kyrgyzstan, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Tajikistan, Turkey, Ukraine, and Uzbekistan.	0.174	0.379	0	1
Latin America and the Caribbean (LAC)	1 if Yes, otherwise 0. Countries included: Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay and Venezuela.	0.287	0.452	0	1
Middle East and North Africa (MENA)	1 if Yes, otherwise 0. Countries included: Egypt, Iraq, Jordan, Lebanon, Morocco, Palestine, Sudan, Syria, Tunisia, and Yemen.	0.043	0.202	0	1
South Asia (SA)	1 if Yes, otherwise 0. Countries included: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka.	0.166	0.372	0	1
Years	Dummy years 2005-2015			2005	2015

The *financial structure* is the independent variables in this chapter, where this study use important balance sheet instruments as proxies, which consist of assets, equity, borrowing,

and deposit. In this chapter, a proxy for *assets* is the total asset, which has been adjusted and standardised provisioning for loan impairments and write-offs. Total equity as a proxy for *equity financing* is a traditional source of capital financing, where institutions exchange a portion of their own finance for the sake of financial investment (Fehr and Hishigsuren, 2006). This study use this proxy to see how the shareholders use their funds in reaching lower-income customers. *Debt financing*, also called liabilities financing, is divided into borrowing and other liabilities. Borrowing here refers to commercial borrowings where it is the long-term funds received by MFIs through a loan agreement or other contractual arrangement that carry a below-market rate of interest (CGAP, 2002). Meanwhile, other liabilities refer to soft loans and concessional loans from multilateral banks, government aid agencies, which is loan offer at a low-interest rate provided for social projects, including conditions and requirements on the management of funds (Fehr and Hishigsuren, 2006; Bogan, 2012). For measuring MFIs' reliance on *deposit* as source of financing, this study uses total deposits, comprised of both voluntary deposits and compulsory savings. Voluntary deposits as the name suggests are standard deposit accounts. At the same time, compulsory savings require borrowers to put aside a minimal amount from the principal loan. This usually applies to group lending methods, acting as collateral to back up the group if there is an individual who defaults in payment within the group.

This study control for organisational, legal form as MFIs consists of different types in their ownership status. The ownership structure status varies in microfinance fields, divided into banks, non-bank financial institutions (NBFIs), credit unions and cooperatives, non-government organisations (NGOs), and other types of lenders. Because NGO credit unions and cooperatives are both non-profit institutions owned and controlled by members, they target on achieving social goals, but only credit union and cooperatives can distribute profit among members (Servin et al., 2012).

Previous studies have examined the significance of all variables included in the control group with the outreach of MFIs. For instance, institutions ownership status (Hartarska, 2005; Hartarska and Nadolnyak, 2007; Bassem, 2009; Mersland, 2009; Vanroose and D'Espallier, 2013), institutions' size (Hartarska and Nadolnyak, 2007; Mersland et al., 2011; Pati, 2012; Ashraf et al., 2014), gross domestic product (GDP) (Vanroose and D'Espallier, 2013; Becchetti and Pisani, 2015), inflation (Hartarska, 2005; Vanroose and D'Espallier, 2013) and population density (Vanroose and D'Espallier, 2013). This control group is used to control for firm-specific and country-specific effects on the outcome. The variable *region* is added to control for regional effects as this study uses a worldwide population. *Years* is also controlled for in this study as it involves a 10-years period.

3.4 Regression Analysis

Assets and outreach

Table 6 reports results of the fixed-effects model in identifying the impacts of financial structure on six aspects of outreach by MFIs; namely, breadth, depth, the cost to users, length, the scope of outreach by deposits, and scope of outreach by a loan. Organisational legal form and region are omitted, thus not included in the result. Consistent with our Hypothesis 1a, this study finds a positive and significant impact of an asset on the breadth of outreach, indicating an increase in assets leads MFIs to reach more borrowers. However, results show that MFIs are also serving large loan size at the same time (Hypothesis 1b), revealing that MFIs are targeting more affluent clients instead of the poor, because the poor are only requiring a small loan due to small-scale activities. This study also finds that MFIs' reliance on assets has a high loan portfolio quality. Conversely, it creates the smooth process

to the loan to be approved and less waiting time for the next borrower (Hypothesis 1d). Moreover, in line with Hypothesis 1e, this study finds a positive and significant impact of assets on the scope of outreach by loan. This study strongly support MFIs are indeed reaching the borrowers through large quantity of loan. This reflects prior literature on the positive impacts of assets on loan portfolio (Vanroose and D'espallier, 2013). From the findings, this study implies that MFIs' reliance on assets is pursuing financial sustainability by targeting the more affluent clientele base that can absorb larger loan-sized.

Debt borrowing and outreach

It is concerning as the findings reveal that MFIs rely on debt financing to pursue financial sustainability by reaching borrowers (breadth) but are charging a high-interest rate (cost to users) (Hypothesis 3a, Hypothesis 3c) and receive a massive quantity of deposits (scope of outreach by deposit) alongside their extensive loan portfolio (scope of outreach by loan) (Hypothesis 3e). Even though literature claims rationalisation behind the costs charged to the borrower, added together with profit and income flow from the premium of the loan, this enable MFIs to repay debt financing and cushion themselves against risk (Kyereboah-Coleman, 2007; Hetland, 2011). However, it sends a signal as an unworthy loan for the borrower by paying high-interest rate despite the small loan amount applied. The findings also shed further insight into the benefit of economies of scope when MFIs are utilising the sources by increasing both deposit and loan products.

Deposit and outreach

It is alarming from our results that MFIs with high reliance on deposit seem to forgo their social objectives. They are targeting wealthier clients that can provide a large number of

deposits by offering high-interest rate for depositors to enjoy high dividend (Hypotheses 4c and 4e). This in turn gives an advantage for MFIs in the case of loan losses (Hetland, 2011). MFIs also seem to grab the benefit by using deposits as a cushion from credit shocks, allowing an increase in efficient liquidation of assets (Berlin and Mester, 1999). This study also finds a significant impact of deposit on the length of time frame; this ultimately tells us that this situation creates longer waiting time for the loan to be approved for the next borrower (Hypothesis 4d).

Table 6 Regression Results: Fixed-Effects Model

Variables	*(Breadth of outreach)*	*(Depth of outreach)*	*(Cost to users)*	*(Length of outreach)*	*(Scope by deposit)*	*(Scope by loan)*
	Active borrowers	Loan size	Nominal yield	PAR30	Deposit Account	Loan portfolio
Assets	0.406***	0.265***	-0.156	-0.058**	0.0158	0.876***
	(0.0466)	(0.0541)	(0.211)	(0.024)	(0.0302)	(0.0665)
Equity	0.00887	-0.00990	0.152	0.008	-0.0188	-0.0139
	(0.0155)	(0.0159)	(0.169)	(0.019)	(0.0270)	(0.0229)
Borrowings	0.0159***	0.000237	0.0619**	-0.004	0.0114**	0.0182***
	(0.00312)	(0.00232)	(0.0291)	(0.003)	(0.00582)	(0.00497)
Deposits	-0.00145	0.00192	0.0995***	0.007**	0.609***	0.00893**
	(0.00193)	(0.00190)	(0.0295)	(0.003)	(0.00940)	(0.00392)
MFI size	0.385***	-0.177***	0.477	0.061**	0.0623	0.121***
	(0.0406)	(0.0362)	(0.322)	(0.028)	(0.0565)	(0.0417)

GDP	0.00548	0.375***	1.275	-0.318***	-0.444***	0.219***
	(0.0709)	(0.0882)	(1.108)	(0.098)	(0.144)	(0.0773)
Population density	1.037***	-0.159	12.15**	-1.000**	3.648***	0.764
	(0.401)	(0.366)	(4.896)	(0.492)	(0.791)	(0.517)
Inflation	0.00440**	-0.00242	0.0582**	-0.005	-0.00828**	0.000852
	(0.00194)	(0.00153)	(0.0253)	(0.004)	(0.00388)	(0.00226)
Years	Included	Included	Included	Included	Included	Included
Constant	-4.181*	-6.001***	-53.17	14.10***	-5.153	-7.565***
	(2.154)	(2.046)	(32.33)	(2.937)	(4.468)	(2.930)
Observations	9,892	8,695	10,626	8,392	9,366	10,572
R-squared	0.612	0.329	0.024	0.048	0.800	0.735
Number of MFIID	1,892	1,829	1,915	1,774	1,810	1,914

Notes: * p<0.1; ** p<0.05; *** p<0.01. Standard errors are in parentheses.

3.5 Conclusion

A growing number of scholars have developed an interest in investigating MFIs' performance by carrying out their dual mission, *outreach to the poor* and *financial sustainability*, specifically on the trade-off between MFIs' financial and social missions (Adair and Berguiga, 2014; Adhikary and Papachristou, 2014; Abdulai and Tewari, 2017). However, only very limited literature focuses on understanding outreach. Some of the studies focus more on MFIs' profitability and financial sustainability (Kar 2013; Bhanot and Bapat, 2015), competition and commercialisation (Assefa et al., 2013; Johnson, 2015), macroeconomics (Ahlin et al., 2010Vanroose and D'espallier, 2013; Ashraf et al., 2014), governance (Mersland et al., 2010; Barry and Tacneng, 2014; Becchetti and Pisani, 2015); and regulation (Hartarska and Nadolnyak, 2007). While some studies do evaluate social outreach performance (Vanroose and D'espallier, 2013; Adhikary and Papachristou, 2014; Khatchatryan, 2017; among others), they tend to concentrate more on analysing two essential outreach forms – breadth and depth. This study therefore extends the previous literature by analysing six different types of social outreach performance – breadth, depth, costs to users, length, scope of outreach by deposits and loan.

Besides, a considerable body of literature (Kyereboah-Coleman, 2007; Bogan, 2012; Kar, 2012; Pati, 2012) evaluating social performance as the primary outcome has been conducted in various context, yet only a few studies concentrates on the impact of the MFI's financial structure (assets, equity, borrowings, and deposits) as its characteristics in the outreach performance. Thus, this study bridges the gap by examining the relationship between each funding instruments of MFIs financial structure on their outreach performance. This is

because the financial structure is considered a vital factor in any decision for firms, including MFIs, to achieve the intended mission inside the organisations (Sanfelieu et al., 2013).

Empirical panel results covering 10 years (2005-2015) of 2, 330 MFIs over 116 countries, show that MFIs that rely on assets focus on reaching as many of the poor as possible through loans. However, this study finds those MFIs are abandoning the depth of outreach by mainly targeting the wealthier clientele base that can absorb large loan size. This supports argument on the MFIs preferences of conservative financial strategies such as assets have lower social impacts.

Moreover, this study also creates an insight on theoretical and practical implications from the current outreach literature suggesting that debt financing help MFIs benefit from economies of scope, as they are focusing on a variety of products (loan and deposits account). As deposits are the most popular and convenient source of financing, MFIs that rely more on this funding source focus on increasing their client base in deposits account as well as loan portfolio. They also raise interest rates above the bar, which might be for the sake of depositors to enjoy high dividend.

This study provides additional insight on the possible trade-off between breadth and depth of outreach as these findings indicate focusing on reaching large number of borrowers leading MFIs to serve large loan-sized. These findings also provide an insight into the competition between lenders (MFIs) for external funding leading to higher cost of fund, ultimately makes MFIs increase the interest rate. These situations are crucial for investors and funders to understand the directions of MFIs in fulfilling their welfare duties or pursuing

an institutional goal for survival in the financial industry, in correlation with their chosen financial resources. This research might also be beneficial to investors, donors and governments that are interested to know about the success of microfinance implementation programmes, as well as the microfinance institution's welfare performance in helping to reduce poverty across the world.

Chapter 4 Exploration of Different Types of Social Efficiencies

Abstract

Efficiency analysis has attracted interest among researchers and scholars in different contexts using different methodologies. Existing literature mostly focusing on financial efficiency and less focus on social efficiency. This study advances the current body of knowledge by explore different types of MFIs social efficiency levels (outreach to women, breadth, depth, costs to users, length, the scope of outreach by deposit, and scope of outreach by loan). Besides, this study also explores factors influencing these 7 types of social outreach efficiency, where few studies exploring this area. This study run Stochastic Frontier Analysis (SFA) on 2, 330 MFIs operating across the worlds, this study finds that social outreach inefficiencies of MFIs are mainly originated from external shocks or factors beyond MFIs' management control such as regulation and rural population, when they focus on their outreach performance – depth, costs to users, length, and scope of outreach by deposits and loan. Meanwhile, this study finds MFIs rely on controllable factors or factors under the control of MFIs' management when focusing on breadth of outreach overall, (reaching to the poor) and outreach to women in particular.

4.1 Introduction

Microfinance institutions (MFIs) are different from traditional financial institutions as they carry the double objectives of *wealth* maximisation, and *socia*l maximisation (Hassan and Sanchez, 2009). Efficiency in microfinance is defined as an optimal combination of inputs (staff time, staff numbers and costs of operation) to respectively disburse and reach the

maximum number of loans and clients, especially in deprived areas, while delivering a range of valued services (Annim, 2010). Therefore, the efficient frontier is the set of the optimal outputs given the inputs (or the optimal input given the output) (Hassan and Sanchez, 2009). There are three types of efficiency that are commonly measured in microfinance literature; these are (i) allocative efficiency (e.g., how close a microfinance cost lies to the efficient cost frontier for a given technology), (ii) technical efficiency (e.g., the efficiency of MFIs in using resources in the production process with a given technology), and (iii) economic efficiency (e.g., requires both technological and allocative efficiency, where the optimal inputs and/or outputs are chosen based on both the production technology and the relative prices in the market). However, this study focuses on evaluating the production level of the technical efficiency of MFIs as this variable is easier to measure and interpret. Technical efficiency (TE) in microfinance represents the capacity of MFIs as a decision-making unit (DMU) to proportionally increase its outputs without also increasing its inputs (Fall et al., 2018). Ratio analysis is widely used to measure the operational, costs, efficiency, financial, and social performance of MFIs. However, current performance ratios are unable to capture whether MFIs reach social wealth maximisation by focusing on one of the objectives, unlike an efficiency analysis approach that recognises the efficiency resources by a mix of inputs and outputs (Hassan and Sanchez, 2009).

There is a growing interest in literature on measuring MFIs' efficiency in a different context with different methodologies. For instance, Servin et al., (2012) used stochastic frontier analysis (SFA) to examine the technical efficiency of different types of MFIs, find a correlation with MFIs' governance. Meanwhile, Wijesiri et al., (2017) found an impact of age and size on social and financial efficiency, using metafrontier Data Envelopment Analysis (DEA). The literature (Gutierrez-Nieto et al., 2007) discusses the efficiency of the money lent to MFIs by donors and investors as microfinance emerged as a new approach to

fight poverty. Even though funding agencies prefer a higher level of outreach, donors are also concerned about the efficient use of the funds allocated by them (Quayes, 2015). Thus, efficiency measurement is crucial for the states and donors regarding funding decisions because the analysis is more fact-based when analysing social worth or underperforming MFIs (Wijesiri et al., 2015).

Although there is a growing literature measuring the efficiency of the social mission by MFIs, there is limited research on assessing MFIs' social efficiency in the broader aspects of outreach. Most of the literature (Gutiérrez-Nieto et al., 2007; Servin et al., 2012; Lepetit and Nzongang, 2014; Wijesiri et al., 2017) concentrates on three essential dimensions of outreach efficiency – outreach to women, breadth of outreach, and depth of outreach. This study bridges the gap in the extant literature by assessing MFIs' social efficiency in seven possible aspects of outreach (outreach to women, breadth, depth, costs to users, length, the scope of outreach by deposit, and scope of outreach by loan). Therefore, this fourth chapter objective is to explore the factors of production efficiency and inefficiency of MFIs. This study aims to analyse the production level of MFIs when they pursue their social mission. This study employs the Stochastic Frontier Analysis (SFA) to measure the social efficiency of 2, 330 MFIs from 2005 to 2015.

This study find that MFIs are not reaching enough to the poor in terms of outreach, there are factors influencing their social outreach efficiency. This chapter suggests there are controllable and uncontrollable factors that might affect their total production, which in turn affects their level of social efficiency performance. SFA results show that the MFIs that focusing in achieving a social mission of outreach to women and the breadth of outreach rely on the technical inefficiency component, in which the factors are under the control of MFIs'

management. In this case, when MFIs' management relies on their internal factors (costs, labour, corporate governance, branching of the networks, and business expansion), they produce at lower maximum output if they are focusing on reaching the poor and women borrowers. Meanwhile, MFIs' social inefficiencies arise due to uncontrollable factors such as regulation and rural population, when they focus on achieving the other five aspects of outreach – depth, costs to users, length, and scope of outreach by deposits and loan. This means that MFIs experience external shocks that affect productivity level of efficiency when offering small loan size, lower interest charges, quality time frame, small deposits accounts, and higher loan portfolio, respectively.

The structure of this chapter is as follows. Section 2 discusses the social efficiency conceptual framework and develops hypotheses linking the MFI's social efficiency with controllable and uncontrollable factors. Section 3 explains the methodology involved in constructing the model used in this chapter. Section 4 discusses the SFA regression analysis. The last section discusses the policy implications and concludes the chapter.

4.2 Social efficiency

Outreach to the poor as a social objective of microfinance institutions has become a main area of interest among researchers and has been studied from every angle to measure the achievement of a microfinance institution in fulfilling their welfare mission. In correlation with the dual objectives of MFIs – profit maximisation and outreach maximisation, there is a question on the efficiency of the money lent to MFIs as microfinance emerged as a new approach to fight poverty (Gutierrez-Nieto et al., 2007). For instance, Abate et al., (2014) traced a trade-off between the outreach to the poor and cost-efficiency, suggesting the difficulty in trying to achieve the two goals simultaneously. The literature contends that

MFIs are found inefficient in poverty outreach performance, but financially efficient because of better managing the processes in order to achieve profitability (Wijesiri et al., 2017). MFIs experience sources of inefficiencies because of poor use of resources, or MFIs do not reach their potential in providing services – offering enough loans, raising funds, and attracting more borrowers (Hassan and Sanchez, 2009).

Besides, Bos and Millone (2015) found some MFIs can indeed combine the depth and breadth of outreach, and operate with above-average levels of efficiency, but MFIs' efficiency quickly decreases as the loan portfolio becomes larger. This gives a picture that size and age of the institutions affect MFIs' efficiency. Ngo et al., (2014) and Wijesiri et al., (2017) supported that larger MFIs reached more borrowers (by 10 to 20 times from others), had a high cost per borrower (1.2 to 2 times higher), and had higher financial and social efficiency. In reaching the poor, as MFIs tend to focus on women borrowers, prior research found a negative relation with efficiency (Hermes et al., 2009, 2011; Abate et al., 2014), which suggests that MFIs that cater more to women borrowers are less cost-efficient.

In correlation with MFIs' legal status, Servin et al., (2012) pointed out that MFIs with different ownership types use different forms of technology and have different efficiency levels, while NGOs and cooperatives have lower technology usage due to their focus on a social mission, which leads to higher inefficiencies in managing the number of loans outstanding, as compared to the MFI-banks and NBFIs. This is consistent with other works of literature claiming that financial cooperatives are more cost-efficient than NBFIs due to cheaper enforcement mechanisms for them (Abate et al., 2014); banks are the most efficient MFIs in profitability; and NGOs are on average, the least financial efficient MFIs (Collins, 2019). NGOs try to make a large number of loans and operate as cheaply as possible because

they are operated by volunteers to keep costs down and aim at supporting as many individuals as possible (Gutiérrez-Nieto et al., 2007). Gutiérrez-Nieto et al., (2007) emphasised that non-NGOs rely on their specialised staff to build a profitable portfolio of loans, primarily focusing on the size of loans that guarantee borrowers to get a loan in any size, very much like commercial banks would do. Haq et al., (2010) also pointed out that the amount of non-performing loans, particularly for MFI-banks, causes the reduction of a high level of cost-efficiency of those institutions. From the above literature, this study can suggest that MFI-banks are financially efficient but socially inefficient, for a few reasons: (i) they are supervised by central banking rules and regulations, (ii) their main aims are clearly defined by financial objectives, (iii) they are heavily regulated by monetary authorities, and (iv) they distribute profit to owners (Servin et al., 2012).

Moreover, Hermes et al., (2009, 2011) suggested the existence of well-developed financial systems affects the operations and performance efficiency of MFI in a country. Their findings revealed that MFIs that provide smaller loan size are less efficient, but that total costs of MFIs reduce over 10 years due to technological change. Their argument is supported by Bos and Millone (2015) and Abate et al., (2014), where MFIs with larger loan size have larger numbers of clients and their outreach performances are less cost-efficient when they have a high level of depth of outreach. One plausible reason why those MFIs in well-developed countries offer smaller loan size to the poor might be due to the intention to achieve a better financial position in financial markets (Vanroose and D'Espallier, 2013), which is essential for MFIs' survival in a tight market. From the literature, this study can suggest:

Hypothesis: MFIs are not reaching enough to the poor, because there are factors that influencing their social outreach efficiency performance.

Prior studies (Haq et al., 2010; Servin et al., 2012) emphasise that MFIs have controllable (factor under control) and uncontrollable (factor beyond control) inputs that affect their poverty outreach and operational sustainability. This is explained below.

(a) Controllable factors

According to Bassem (2009), corporate governance as an internal governance mechanism is crucial to align the interests of managers and providers of funds and monitor the efficiency of managers to achieve its objectives. This are because MFIs carry dual missions (outreach to the poor and financial sustainability); thus, lack of managers' self-control (managerial discretion) might divert preferences and objectives of managers within the MFIs' organisational structure (Bassem, 2009; Servin et al., 2012). Additionally, the presence of women inside the organisation also plays a role in determining MFIs' objectives. Bassem (2009) suggested that board diversity is crucial in corporate governance to lead to better performance. However, we believe gender diversity in any managerial position might affect MFIs' efficiency performance, particularly in their outreach performance.

(b) Uncontrollable factors

Haq et al., (2010) emphasised that MFIs face a difficult challenge which may be beyond their control when they were identified as inefficient in reaching the poor and achieving sustainability. The authors suggest social and economic factors (rural population) represent the urbanisation rate for each region as a measurement for uncontrollable factors. The reason is that it might be difficult for MFIs to reach the rural population due to the moral hazard problem (adverse selection), which can lead to waste and mismanagement of resources for

MFIs. Bassem (2009) suggested regulation as an external governance mechanism, where regulation changes the internal rules of the organisation in terms of access to low-cost funding sources such as savings. His results enhance regulation lead to better financial sustainability, not in outreach. Thus, this study believe that regulation might constrain MFIs from achieving better outreach performance.

4.3 Methodology

Technical efficiency measures the ability of the firm to achieve maximum output for a given set of input (Haq et al., 2010). There are four major approaches in evaluating the efficiency of institutions, classified into two linear programming approaches – the *non-parametric* approach involves the Data Envelopment Approach (DEA), and the *parametric econometric* approach including the Stochastic Frontier Approach (SFA), Thick Frontier Approach (TFA), and Distribution-Free Approach (DFA). These approaches differ in assumptions they make regarding the shape of the efficient frontier, the existence of random error, the distributional assumptions imposed on the inefficiencies, and the underlying concept of analyzation on technological efficiency versus economic efficiency (Bauer, 1998).

The non-parametric method, the DEA, introduced by Charnes et al., (1978) using linear programming techniques to evaluate technological efficiency of radial forms of the Decision-making Unit (DMU), which involves constructing an efficient production frontier based on actual input and output sample observations defined by best-performing DMUs (Wijesiri et al., 207). Meanwhile, the parametric approach, comprising SFA, TFA and DFA, imposes more shape on the frontier by specifying a functional form (Bauer, 1998). According to Bauer (1998), TFA gives an estimate of efficiency differences between the best and worst quartiles to indicate the general level of overall efficiency but does not provide

point estimates of efficiency for each individual firm. DFA assumes that there is a core efficiency or average efficiency for each firm which is constant over time for an individual firm that tends to be averaged out with the random error. The concern is that the levels of the DFA efficiency estimates may be influenced by the somewhat arbitrary assumptions (Bauer, 1998). SFA is the most commonly used out of the three parametric approaches, first developed by Aigner et al., (1997) and applied to measure production, cost and profit efficiency in the banking sector. The reasons are (i) it is a suitable approach that allows efficiency analysis using unbalanced panels; (ii) it allows the observed institutions' production efficient to deviate from the frontier; (iii) it incorporates an error term that captures irregularities in the data; and (iv) the other three approaches (DEA, TFA, DFA) do not hold for efficiency measurement (Servin et al., 2012).

Therefore, in this study, by following Haq et al., (2010) as references, we use controllable inputs (cost: operating expenses, labour: personnel) and control variables such as ownership legal form, size: offices, and age: new, young, mature) and run them using SFA method to estimates production frontier of a pooled sample of all MFIs, using half-normal distribution.

4.3.1 Stochastic Frontier Analysis

The SFA production function represents the maximum output attainable given a certain quantity of inputs (Scippacercola and D'Ambra, 2014). SFA estimates parameters of a linear model with a disturbance mixture of two components, idiosyncratic component: u_i and inefficiency term: v_i; where the different specifications of u_i and v_i terms give rise to a distinct model – exponential, half-normal, truncated distribution (Kumbhakar, 1990). The model is as follows:

$$yi = \beta 0 + \sum_{j=1}^{k} \beta j \, xji + vi - ui, \quad (1)$$

where y_i is social outreach output, β is the unknown parameter to be estimated, x_{ji} is log of production function-input (cost: operating expenses, labour: personnel, ownership legal form, size: offices, and age: new, young, mature), u_i, is idiosyncratic component and v_i represents inefficiency term.

The SFA approach decomposes error terms into inefficiency term (u_i) and random component term (v_i) (Servin et al., 2012). In SFA, the u_i are independently half normally distributed, in which this model fits heteroskedastic error components, similar to the exponential model (Kumbhakar, 1990). The error component, v_i represents systematic disturbance and are assumed to be independently and identically distributed as $N(0, \sigma_v^2)$ which means normal distribution with mean zero and variance σ_v^2 (Aigner et al., 1977). One of the advantages of SFA lies in separating the inefficiency that results from random shocks from that which results from the technical inefficiency of the firm (Fall et al., 2018).

In this chapter, this study applies SFA with half normal distribution and regress with controllable inputs; cost: operating expenses, labour: personnel, and other control variables such as legal form (MFI-banks, cooperatives or credit union, NGOs, and NBFIs); size (offices), and age of maturity level (new, young, and mature).

4.3.2 Data and Variables

(a) Data

In this study, this study collected secondary data from the Microfinance Information Exchange Market (MIX Market) database, which can be accessed at www.themix.org. This database is a hub of self-reported quality information, such as financial, social, and operational data from MFIs all over the world since the 1970s. The sample study consisted of 10 years' longitudinal data (2005-2015), and involved 2,330 MFIs across six regions, Sub-Saharan Africa (SSA), East Asia and Pacific (EAP), Eastern Europe and Central Asia (EECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), and South Asia (SA).

(b) Input and Output Variables

According to Nyamsogoro (2012), operational efficiency is determined by internal factors; that is, factors that are controllable by management organisation, divided into assets and liabilities management, portfolio quality, and human resources productivity. In this case, by following Haq et al., (2010) this study use controllable factors to regress with the output, seven aspects of outreach (outreach to women, breadth of outreach, depth of outreach, costs of outreach - costs to users, length of outreach, scope of outreach by deposit, and scope of outreach by loan). Refer to Table 7.

Table 7 Summary statistics and input and output variable definitions

Variables	Description	Mean	Std. Deviation	Min	Max
Outputs:					
Outreach to women					
Number of women borrowers	Fraction of women borrowers*Number of active borrowers.	5.174	3.280	0	15.647

Breadth of outreach					
Number of active borrowers	Ln; The number of individuals or entities who currently have an outstanding loan balance or are primarily responsible for repaying any portion of the gross loan portfolio. Individuals who have multiple loans with MFIs are counted as single borrower.	8.002	2.781	0	15.916
Depth of outreach					
Average outstanding balance	Ln; Gross loan portfolio divided by number of outstanding loans. Represents the average loan size remaining to be paid.	6.355	1.340	0	16.262
Cost of outreach to users)					
Nominal yield of gross loan portfolio	(Financial revenue from loans/Average gross loan portfolio) Helps to estimate the MFI's ability to generate revenues from interest, fees, and commissions over the gross loan portfolio. Income from late fees and penalties are also included.	31.900	16.836	0	99.94
Length of outreach					
Portfolio at risk more than 30 days (PAR30)	Ln; [(Outstanding balance portfolio overdue > 30 days + Renegotiated loans)/Gross loan portfolio]. Represents the portion of loans greater than 30 days past due date, including the value of all renegotiated loans (restructured, rescheduled, refinanced and any other revised loans) compared to gross loan portfolio. The most	1.511	1.001	0	4.615

	accepted measure of a financial institution's portfolio quality.				
Scope by deposits					
Number of deposit account	Ln; The number of deposit accounts opened with the institutions to who the balance is liable to be repaid. The number should be based on the number of individual accounts rather than on the number of groups. This includes accounts such as current/transactional accounts, term accounts, interest-bearing accounts, and e-money accounts.	4.207	5.082	0	16.833
Scope by loan					
Gross loan portfolio	Ln; All outstanding principals due for all outstanding client loans. This includes current, delinquent, and renegotiated loans, but not loans that have been written off. It also includes off-balance sheet portfolio.	15.110	2.418	0	24.154
Controllable inputs:					
Operating expenses	Ln; (Operating expenses ratio *Average gross loan portfolio) Measures all costs incurred to deliver loans (personnel and administrative expenses as well as non-cash expenses such as depreciation and amortization).	18.345	2.164	0	25.726
Personnel	Ln; The number of individuals who are actively employed by MFIs. This number includes contract employees or advisors who dedicate a substantial portion of their time to MFIs, even if they are not on the MFIs' employees' roster.	4.021	2.004	0	12.481

Female staff	Fraction of women managers (Number of women management staff /number of all management staff).	0.328	0.271	0	1
Legal form:					
MFI-Bank	A licensed financial intermediary regulated by a state banking supervisory agency. It may provide any of a number of financial services, including: deposit taking, lending, payment services and money transfer. 1 if Yes, otherwise 0	0.092	0.289	0	1
Cooperatives	A non-profit, member-based financial intermediary. It may offer a range of financial services, including lending and deposit taking, for the benefit of its members. While not regulate by state banking supervisory agency, it may come under the supervision of regional or national cooperative council. 1 if Yes, otherwise 0.	0.172	0.378	0	1
NGOs	An organisation registered as a non-profit for tax purposes or some other legal charter. Its financial services are usually more restricted and are typically not regulated by a banking supervisory agency. 1 if Yes, otherwise 0.	0.338	0.473	0	1
Rural banks	Banking institutions that target clients who live and work in non-urban areas and who are generally involved in agricultural-related activities. 1 if Yes, otherwise 0	0.043	0.205	0	1
Others (including NBFIs and other types of MFI)	An institution that provides similar services to those of a bank, but is licensed under a separate category. The separate license may be due to lower capital requirements, to	0.353	0.478	0	1

	limitations on financial service offerings, or to supervision under a different state agency. In some countries this corresponds to a special category created for microfinance institutions. 1 if Yes, otherwise 0				
Maturity level (age)					
New	1 to 4 years of microfinance operations.	0.164	0.370	0	1
Young	4 to 8 years of microfinance operations.	0.186	0.389	0	1
Mature	More than 8 years of microfinance operations.	0.650	0.477	0	1
Size	Ln; number of offices (MFI branches).	2.419	1.310	0	8.432
Uncontrollable inputs:					
Rural population	Refers to people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.	n/a			
Regulation	This field is marked as 'Yes' if the entity is submitted to some regulatory authority, whether a formal banking regulator or some other financial services regulator. This most often concerns entities that are listed as 'Banks' and 'Non-bank Financial Institutions (NBFIs)', but may also include 'Credit Union/Cooperatives' or 'Non-Governmental Organizations (NGOs)' in some markets.	n/a			

Note: +Variables are defined by MIX Market and World Bank.

n/a: not applied

The first aspect of outreach is *outreach to women*, measured by number of women borrowers, following Navajas et al., (2000) and Schreiner (2002). This aspect is to examine MFIs' fulfilment of their promise to help women borrowers as small entrepreneurs because they have limited access to credit from traditional banks or financial institutions, due to lack of collateral and insecure financial background. The second aspect of outreach is the *breadth of outreach*, measured by number of active borrowers, consistent with the outreach framework of Navajas et al., (2000) and Schreiner (2002). This aspect is to see whether MFIs are genuinely reaching the poor and the poorest of the poor through loans with easy access. Next is the *depth of outreach*, the measure by average outstanding balance as a loan size measurement, as suggested by Schreiner (2001). It is preferably for MFIs to offer small loan size to the borrower, as it fits the nature of their small needs and businesses. The *costs of outreach (costs to users)* are measured by nominal yield for an interest rate offered by MFIs to borrowers, following Woller (2006) and Lepetit and Nzongang (2014). Therefore, the lower the interest rate charged by MFIs, the worthier this loan to the borrowers as they can pay less interest and realise more profit from their business. The fifth aspect of outreach is the *length of outreach*, defined as the time frame within which MFIs produce loans (Navajas et al., 2000; Schreiner 2002). It is measured by the portfolio at risk more than 30 days (PAR30) suggested by Woller (2006). This study believes that the higher PAR30 ratio leads to a delayed in the loan process, and vice versa. For the *scope of outreach by deposit*, this study measure this by number of deposit accounts. In the microfinance case, the small deposit is preferred (Navajas et al., 2000; Schreiner, 2002). Meanwhile, the *scope of outreach by a loan* is measured by gross loan portfolio, preferably in a large quantity of small loan.

For controllable factors, which are factors under MFIs' control, as suggested by previous research, we select operating expenses as the input of costs (Gutiérrez-Nieto et al., 2007 Servin et al., 2012; Wijesiri et al., 2017), personnel as input of labour (Haq et al., 2010; Servin et al., 2012), ownership legal form (Tchuigoua, 2010; Servin et al., 2012), and age and size (Wijesiri et al., 2017). (refer to Table 7 for more explanation).

4.4 Regression Analysis

This study run Stochastic Frontier Analysis with half-normal distribution to estimate production frontier for a pooled sample of MFIs, by regressing controllable inputs with seven aspects of outreach. As shown in Table 8, the F-statistics of the likelihood ratio test for outreach to women and breadth of outreach is optimal production possibilities frontier ($Prob > x^2 = 0.000$), suggesting that MFIs that succeed in achieving the social mission of outreach to women and breadth of outreach rely on the technical inefficiency component (u), where the factors are under the control of MFIs' management (Servin et al., 2012). This study can suggest here when MFIs' management rely on their internal factors (costs, labour, corporate governance, branching of the networks, and business expansion), they produce at lower maximum output if they are focusing on reaching the poor and women borrowers. This is in line with the hypothesis.

Table 8 Production Stochastic Frontier regression

Variables	*(Outreach to Women)*	*(Breadth of outreach)*	*(Depth of outreach)*	*(Cost to users)*	*(Length of outreach)*	*(Scope by Deposit)*	*(Scope by loan)*
	Female borrowers	Active borrowers	Loan size	Nominal yield	PAR30	Deposit account	Gross loan portfolio
Operating Expenses	-0.456***	0.058***	0.349***	2.537***	0.091***	0.452***	0.631***
	(0.02)	(0.007)	(0.009)	(0.130)	(0.008)	(0.037)	(0.007)
Personnel	0.855***	0.958***	-0.002	-1.463***	-0.098***	-0.584***	0.098***
	(0.018)	(0.007)	(0.008)	(0.115)	(0.008)	(0.033)	(0.006)
Female staff	0.314***	-0.030	0.482***	-0.997	-0.068	-0.032	0.256***
	(0.098)	(0.036)	(0.045)	(0.665)	(0.043)	(0.190)	(0.034)
Legal form:							
MFI-bank	-1.363***	-0.139***	0.456***	-6.296***	0.021	5.283***	0.449***
	(0.101)	(0.037)	(0.043)	(0.653)	(0.042)	(0.186)	(0.033)
Cooperatives/ Credit Union	-0.778***	-0.065**	0.647***	-10.54***	0.150***	4.464***	0.381***
	(0.087)	(0.031)	(0.038)	(0.560)	(0.036)	(0.160)	(0.028)
Non-governmental	1.043***	0.219***	-0.590***	0.592	0.012	0.390***	-0.403***

Organisation	(0.066)	(0.024)	(0.029)	(0.425)	(0.026)	(0.120)	(0.022)
Rural Bank	-0.435***	0.008	-0.275***	-1.492*	0.593***	7.007***	-0.123***
	(0.138)	(0.050)	(0.061)	(0.906)	(0.0576)	(0.256)	(0.046)
Non-bank Financial Institutions[+]							
Size (Offices)	0.864***	0.218***	-0.542***	-1.824***	-0.056***	1.244***	0.293***
	(0.029)	(0.010)	(0.013)	(0.189)	(0.012)	(0.054)	(0.010)
Age (Maturity level):							
New	0.450***	-0.157***	-0.421***	7.477***	-0.409***	-0.255	-0.603***
	(0.089)	(0.032)	(0.040)	(0.586)	(0.038)	(0.167)	(0.030)
Young	0.292***	-0.106***	-0.222***	6.229***	-0.268***	-0.094	-0.343***
	(0.070)	(0.026)	(0.031)	(0.465)	(0.029)	(0.132)	(0.024)
Mature[+]							
ln σ^2_v	1.209***	-0.979***	0.008	5.488***	-0.155***	2.924***	-0.480***
Std. Error	(0.057)	(0.038)	(0.016)	(0.0155)	(0.016)	(0.016)	(0.06)
ln σ^2_u	1.844***	0.144***	-10.79	-5.869	-10.80	-7.049	-12.45
Std. Error	(0.090)	(0.041)	(101.2)	(80.15)	(89.47)	(69.95)	(109.7)

Constant	9.952***	3.832***	1.294***	-3.138	0.453**	-5.883***	2.883***
	(0.387)	(0.122)	(0.242)	(2.768)	(0.214)	(1.033)	(0.140)
Significance level of the likelihood ratio	0	0	1	1	1	1	1
Likelihood-ratio test of $\sigma_u = 0$: x^2 (1)	70.26	3.8	0	0	0	0	0
Log likelihood	-18804.159	-10655.579	-10987.374	-34750.498	-10016.142	-22971.757	-9841.9008
Wald x^2 (10)	7111.53	45093.56	4708.91	1266.41	594.46	3689.33	44564.29
Number of observations	8,252	8,252	7,721	8,348	7,467	7,973	8,348

Note:

(***), (**), (*): denote statistically significant at 1%, 5% and 10% levels, respectively.

[+] Denotes reference category.

The results are consistent with prior research on the importance of controlling internal governance mechanisms such as corporate governance and managerial discretion (Bassem, 2009; Servin et al., 2012) as it affects the social efficiency of MFIs. This study also suggests the critical role of gender diversity inside MFIs' organisational structure in ensuring the efficiency of MFIs in their social mission. Besides, the results are consistent with those of Wijesiri et al., (2017) and Hermes et al., (2009, 2011) where size and age of the institutions affect MFIs' social efficiency in reaching the poor and women borrowers.

On the other hand, F-statistics of likelihood ratio test for depth of outreach, costs to users, length and scope of outreach by deposit and loan (*Prob* > x^2 = *1.000*). It indicates the inefficiency (u) of the other five aspects of outreach arise mostly from the random noise component; this represents uncontrollable factors or external shocks beyond MFIs' control which affects their total production (Servin et al., 2012). This means when MFIs achieve their other five social objectives – depth of outreach (offering small loan size), costs to users (low-interest rate), length of outreach (minimal waiting time for loan approval), scope of outreach by deposit (receive small deposits) and scope of outreach by loan (high loan portfolio) – MFIs' inefficiencies arise due to the external shocks (i.e. rural population and regulation).

While this study reflect non-NGOs operate similarly to commercial banks as they rely on specialised staff to build a profitable portfolio of loans primarily focusing on the size of loans that guarantees borrowers (Gutiérrez-Nieto et al., 2007), this results strengthening the fact that some MFIs such as MFI-banks and rural banks that are regulated by central banking authorities, they mainly pursuing financial objectives, restricting them to focus on a social mission. This finding also emphasizes prior results by Haq et al., (2010) on the effects of the

rural population, as the difficulties in reaching rural areas lead to adverse selection of borrowers, which might affect MFIs' management of resources.

4.5 Conclusion

Although there is a considerable body of literature on measuring MFIs' efficiency from financial and social aspects (Gutiérrez-Nieto et al., 2007; Servin et al., 2012; Wijesiri et al., 2017), there is a lack of research on measuring MFIs' social efficiency in broader aspects of outreach. This research expands the literature on analysing seven different types of social efficiency (outreach to women, breadth, depth, costs to users, length, the scope of outreach by deposit, and scope of outreach by loan). Besides, this study also explores the factors influencing social outreach efficiency of MFIs, in which few studies explores in this area.

From the SFA production regression, this study can suggest that when MFIs focusing on reaching women and the poor, there are factors that affect inefficiency level of MFIs, but under the MFIs' control, which are cost: operating expenses and labour: personnel and female staff). Meanwhile, when MFIs achieve their social mission in terms of the depth of outreach, costs to users, length, and scope of outreach by deposits and loan, MFIs' inefficiencies arise due to the external shocks (regulation and rural population). The reason might be because some MFIs such as MFI-banks are tied with central banking rules and regulations and heavily regulated by monetary authorities (Servin et al., 2012). This makes them more driven in strengthening their financial sustainability. This finding contributes additional empirical evidence for the governance and managerial discretion of MFIs when carrying a dual mission, which is financial sustainability and outreach to the poor.

This findings reflect those of Nyamsogoro (2012) where there are *internal* factors (factors controllable by management organisation, such as assets and liabilities management, portfolio quality, and human resources productivity) and *external* factors (factors that are not controllable within MFIs, such as rules of government on high wages and salary which means that some small MFIs may not be able to afford to employ qualified personnel without significantly affecting their overall operating expenses) which might affect MFIs' efficiency. Besides, there are variations of inefficiencies in MFIs' management, such as the degree of staff commitment to clients, the effectiveness of training programmes, and the productivity of workers, among others (Abayie et al., 2011).

Importantly, large MFIs enjoy economies of scope when focusing on achieving financial efficiency. The ability to use sophisticated technology systems makes large MFIs more compatible with competitive financial markets. This competitive edge is vital for the policymakers in choosing the optimal scope to achieve social efficiency, at the same time for MFIs to maintain the efficiency of their financial performance, in order to benefit from economies of scope. Besides, the emerging trends of mergers and acquisitions and upscaling and downscaling play vital roles in MFIs choosing optimal scope suitable for their operations in order to achieve their mission (Ngo et al., 2014).

Chapter 5 Conclusions

5.1 Contributions and Implications

This research reports an assessment of the social performance of operating MFIs across 63 countries, from 2005 to 2015. The assessment seems encouraging as there is scarce literature that accesses broader dimensions of outreach performance. This study addresses the gap by analysing seven aspects of outreach; namely, outreach to women, breadth of outreach, depth of outreach, costs to users (worth of outreach), length of outreach, the scope of outreach by deposit, and scope of outreach by a loan. Besides, this study investigates the effects of MFIs organisational structure and characteristics on their social outreach performance.

The findings of this study expand microfinance literature that women representatives in MFIs across all management levels lend more to women borrowers to be entrepreneurs. This is consistent with psychological studies by Eckel and Grossman (1998) which found that women are more concerned about others' well-being, particularly when engaging with women. The findings also contribute to the gender and entrepreneurship literature as we enhance the importance of gender composition across MFIs' management in reaching women. The findings reflect prior literature that women leaders are more socially oriented and more concerned about gender equality when reaching to women because women are considered disadvantaged in their access to credit (e.g., Hartarska et al., 2014; Damme et al., 2016; Thrikawala et al., 2016).

Moreover, the findings contribute to the managerial implications for the different target markets of MFIs affecting the lending pattern to women entrepreneurs among borrowers. MFIs that serve higher income levels are less likely to increase lending to women borrowers

as compared to MFIs that serve lower income levels. Our findings emphasise prior literature on a significant trade-off between depth and breadth of outreach as the majority of MFIs do not reach the poorest of the poor, but tend to serve a broader target market (Bos and Millone, 2015). This reflects findings by other studies where MFIs focus on a broader scale of wealthier clients to pursue profit even though they may have to sacrifice their social goals (Cull et al., 2007; 2009; 2015; D'espallier et al., 2013). Furthermore, this study also contributes to financial regulatory as we find that the differences of ownership of MFIs affect the direction of MFIs' goals. MFIs' performance varies according to their legal ownership status, where NGOs are the most consistent in reaching women borrowers, strengthening the view of NGOs as a social organisation (Fernando, 2004; Bassem, 2009; Vanroose and D'espallier, 2013).

This study also contributes to the extant literature of microfinance by identifying the effects of the MFI's characteristics and its financial structure on seven aspects of outreach. First, the results imply that MFIs' chosen financial strategies play an important role in their lending patterns to the poor and women as borrowers and as small and medium entrepreneurs. Based on the findings, MFIs that are dependent on assets have a high number of borrowers (breadth of outreach), with a high loan portfolio (scope of outreach by loan) of large loan size (depth of outreach), but they have a smaller proportion of women borrowers (outreach to women). This means that when MFIs prefer conservative lending strategies such as assets as primary financing, they focus less on depth of outreach and reaching women.

However, once external sources of finance (debt financing and deposit) are targeted and brought in, MFIs appear to be more supportive of women entrepreneurs as well as reaching out to the poor. This finding eliminates the negative thoughts on the effects of commercial

borrowings and deposits on MFIs' outreach. MFIs also utilise both deposit and loan to enjoy the benefit of economies of scope. However, they do raise interest rates above market price to the borrowers, to compensate for the cost of debt financing Also, the high-interest rate is attractive for the depositor (Hossain et al., 2013; Mashamba et al., 2014), which is crucial for MFIs that depend on deposit-taking as a primary source of funding. This emphasises the supposition on the use of debt and deposits to increase the MFI's firm value, which might in turn boost its position as an attractive investment for funders (Steve, 2017).

This study runs the Stochastic Frontier Analysis (SFA) to analyse the social efficiency of different types of MFIs. These findings conclude MFIs are not reaching enough to the poor in terms of outreach, as there are factors that influence the social efficiency of MFIs. This study finds when MFIs focus on outreach to women and breadth of outreach, they rely on the technical inefficiency component. This means that MFIs rely on factors under the control of MFIs' management (cost and labour) when reaching the women and the poor. The findings enhance the crucial role of internal governance mechanism in the social efficiencies of MFIs, particularly among managers and loan officers, when reaching the poor.

This study also finds that MFIs social inefficiencies are originated mainly from external shocks or factors that are beyond the control of MFIs' management. When MFIs focus on depth, costs to users, length, and scope of outreach by deposits and loans, their social inefficiencies arise from random noise components. This means that, when MFIs offer small loan sizes, low-interest rate charges, less waiting time for loan acceptance, receive a small deposit account, and have a high amount of loan portfolio, there are random uncontrollable factors or external shocks that are beyond MFIs' control that affect the total production level of efficiency of MFIs. The plausible factors that can be suggested here are social-economic

factors (such as rural population) and external governance mechanisms (such as regulations). Social-economic factors represent the urbanisation rate for each region where the moral hazard issues due to adverse selection of borrowers in a rural area might lead to waste and mismanagement of resources for MFIs (Haq et al., 2010). For regulation as an external governance mechanism, regulation changes the internal rule of the organisation, such as access to low-cost funding sources (Bassem, 2009); for instance, MFI-banks that are tied to central banking rules and regulations, and monetary authorities tend to prioritise financial sustainability. This is consistent with previous scholars claiming profit-oriented MFIs drifting their social mission and pursuing financial sustainability, leaving only non-profit MFIs striving to achieve their welfare mission (Bassem, 2009; Vanroose and D'Espallier, 2013; Barry and Tacneng, 2014).

While supporting previous literature which reports that the government rules on high wages and salary create a burden for small companies, thus affecting their operating expenses (Nyamsogoro, 2012), this study suggest the importance of mergers and acquisitions to increase the production and social efficiency of MFIs. When these matters are taken care of, this ultimately increases the technical efficiencies of MFIs when achieving their social mission.

5.2 Limitations and future works

The secondary longitudinal data involved in this study are collected from the Microfinance Information Exchange Market (M.I.X Market) database, which has been widely used by scholars in assessing the performance of Microfinance Institutions (MFIs) in any context (costs and operational, social, and financial). This is because the database is readily available

on the website for the researchers and scholars, as it is self-reported by participating in Microfinance Institutions (MFIs) regarding its operational, financial, and social information. Therefore, this might limit this study from carrying out an extensive research in investigating the effectiveness and efficiencies of MFIs' social performance.

Hence, as this study involves secondary quantitative data, future research can include qualitative information (such as interviews or questionnaires) related to outreach for more robust and comprehensive research. Besides, future research could develop additional types of outreach to achieve a broader analysis of social outreach performance. As referenced from previous outreach framework (Navajas et al., 2000; Schreiner, 2002; Woller and Schreiner, 2004; Woller, 2006), there are eight aspects of outreach (breadth, depth, costs, worth, length, scope, scale, and outreach to community). Therefore, assessment of additional aspects of outreach might be beneficial for donors, government, and financial regulators in alleviating the poverty across the world. Furthermore, in correlation with efficiency, future research could compare different efficiency approaches (Data Envelopment Analysis, Thick Frontier Analysis, Distribution-Free Analysis) when measuring other types of MFIs' efficiency such as allocative and economic efficiency, other than the more widely measured production-technical efficiency. Future assessment can also diversify into different groups, such as MFIs' ownership status, geographical location, or technologies. Future research also could explore a meta-analysis approach to evaluate how closely the operating MFIs perform with each other and industry under different technologies.

Glossary of Terms

List of References

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