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Compatibility between Outreach and Efficiency in the Microfinance Market

Abstract:

The aim of this thesis is to investigate whether there existed a trade-off between outreach to the poor and efficiency of MFIs between year 2000 and 2010. The study is conducted on a sample of 1679 observations from countries worldwide and is analyzed through Stochastic Frontier Analysis. The results from this study suggest that there was indeed a negative correlation between outreach to the poor and efficiency of MFIs, as have been found in previous studies. Although, this study also suggests that a high percentage of women borrowers not necessarily have to be positively correlated with a higher level of inefficiency, which is a new finding.

Keywords: Microfinance, MFIs, Outreach, Efficiency, Stochastic Frontier Analysis

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1 INTRODUCTION

Professor Muhammad Yunus¹ dreams of a world where “even the poorest and most unfortunate achieve dignity, respect and meaning in their lives” (Reed, 2011 p.2). To help achieve this dream, he started Grameen Bank in 1976 which is a bank that give small loans to poor people without collateral, who would otherwise be considered unbankable (Grameen Bank, 2012). After the success of Grameen Bank, many other players have adopted this methodology, and in the last decade, the microfinance market has literarily boomed. With today’s competition among Microfinance Institutes (MFIs), one could draw the conclusion that this is a relatively effective market with a rather broad outreach. But lending to the poor is a costly activity: the poorer the borrower, the costlier it is to the lender. MFIs have also evolved from being charitable financially non-sufficient to self-sufficient and profit maximizing institutions. A well-known example of this was the IPO of MFI provider Banco Compartamos of Mexico in April 2007, which was oversubscribed by 13 times and had its worth driven up to an astonishing \$1.6 billion. At the same time, the poor clients of this bank paid interest rates as high as 94 percent. (Cull et al., 2009) The question that will be investigated in this thesis is how well MFIs find the right balance between profitability and social responsibility in terms of efficiency and outreach.

Today over 190 million clients around the world are served by over 3000 MFIs which come in the form of cooperatives (COOP), non-government organizations (NGOs), non-bank financial institutions (NBFIs), post office savings banks, and commercial banks. The word microfinance refers to services like small loans, savings accounts, insurance and other financial technology like mobile banking. There are different types of lending methodologies among MFIs: Village banking, individual banking and group lending are some examples. (CGAP, 2012a) Today, however, most MFIs offer mixed lending alternatives depending on the client’s situation (Gaul, 2012). Assuming that every household in the world has four to five family members, these actions of MFIs impact the lives of almost 1 billion people today. Nonetheless, there are still at least 2 billion adults in the world who are living in poverty. (Reed, 2011) The outreach to the poorest individuals still needs to become better while this is also the costliest group for MFIs to provide services for (Hulme and Mosley, 1996). Lately, MFIs have experienced a paradigm shift concerning the main goal of their operations. MFIs

¹ Professor Muhammad Yunus is the founder of Grameen Bank and received the Nobel peace prize in 2006 for his efforts to reduce poverty.

have gone from being subsidized non-self sufficient to efficient profit maximizing institutions. The reasons for this shift in focus mainly come from: (1) the increasing competition among MFIs, (2) the commercialization of microfinance (i.e., the interest from commercial banks and investors to finance MFIs), (3) technological change that also has become available for and implemented in microfinance, and (4) financial liberalization and regulation policies of governments. (Rhyne and Otero, 2006) From an economic perspective, the competition should drive down interest rates for borrowers and make MFIs come up with new and better services for their clients. Because of the lack of transparency in the industry as well as the low awareness of the borrowers, however, greedy investors can easily take advantage of the situation which could spiral downhill faster than expected.

In order for MFIs to be self-sufficient, they need to cut costs, which could lead them to choose clients who live in easy-to-access areas and who do not belong to the poorest segment. Because of the importance of not forgetting about the fundamental purpose of microfinance stated by Mohammad Yunus (i.e., that even the poorest and most unfortunate should be able to achieve dignity, respect and meaning in their lives), MFIs need to be careful when making operating decisions. MFIs also need to be monitored and regulated by the government to make the industry more transparent to both investors and borrowers so as to make the microfinance market more efficient as a whole.

Because of the boom in the microfinance industry researches have started to take interest in examine the MFIs efficiency and outreach and how it has developed in parallel with the growth in the industry. Efficiency in regular banks has been tested for years but not until recently have researchers started to apply these theories in efficiency to MFIs. One of the most comprehensive studies that have been made is the one by Cull et al. (2007). They use a dataset of 124 MFIs in 49 countries and aim at answering the questions: Does raising interest rates exacerbate agency problems as detected by lower repayment rates and less profitability? Is there evidence of a trade-off between the depth of outreach to the poor and the pursuit of profitability? Has mission drift occurred i.e. have microfinance banks moved away from serving their poorer clients in pursuit of commercial viability? The results of this study show that on the whole, institutional design and orientation matter when considering trade-offs in microfinance. Village banks that focus on the poorest individuals face the highest average costs and the highest subsidy levels. On the other hand, Individual based lenders earn the highest average profits but do least well considering reaching out to the poor. Unfortunately,

those MFIs who achieve the ultimate goal of microfinance and managed to achieve profitability together with notable outreach to the poor are still the exception.

The latest previous research is a study by Hermes et al. (2011). This study investigates whether there is a trade-off between outreach to the poor and efficiency of MFIs by using a sample of over 1300 observations from MFIs worldwide. They were the first ones to apply stochastic frontier analysis to this issue which they argue should be a much more comprehensive method to address this question with. The results suggest that outreach and efficiency is indeed negatively correlated.

Furthermore Hermes and Meesters (2009) investigated whether the performance of MFIs are associated with macro conditions. The authors measure the performance in terms of the cost efficiency of MFIs' operations. The results from the study show that economic growth and financial development are associated with MFIs' efficiency. Most researchers in microfinance come to the same conclusion; the unit transaction costs for small loans to low-income clients are high, and even equal to unit costs of large loans (Hulme and Mosley, 1996; Conning, 1999 etc.).

Because of the rapid growth in the microfinance market in recent years, this study will add value by providing an in-depth analysis on how the development of trade-off between outreach and efficiency in MFIs around the world has evolved between year 2000 and 2010. The analysis will be based on Stochastic Frontier Analysis (SFA) of a balanced panel data set consisting of 1679 observations². The study is limited to investigate the cost and inefficiency function through a restricted set of variables accounting for costs and outreach. The focus of the analysis is on the inefficiency function.

Research question:

- *Did there exist a trade-off between outreach to the poor and efficiency of MFIs between year 2000 and 2010?*

² See Table 1-3 in Appendix for descriptive statistics for Legal Status by Year, Region and ALB.

The outline of the thesis is organized as follows. In Chapter 2 the theory of both microfinance and SFA will be summarized and important definitions will be stated. Chapter 3 explains the methodology and the data set in detail, and Chapter 4 set forth the results and analysis as well as provides a critical discussion. In Chapter 5, the main findings are summarized and the conclusions derived from the analysis will be stated.

2 THEORY

The aim of this chapter is to give a brief introduction to microfinance as well as to the structure of its operations. Definitions of the most common terms will also be specified.

2.1 AN INTRODUCTION TO MICROFINANCE

Microfinance offers low-income individuals access to basic financial services. These services include loans, savings accounts, money transfer services and insurance, and aim at helping individuals from a range of poverty levels. Because of a diverse group of clients, MFIs need to offer a variety of financial products and programs in order to satisfy the different preferences and needs. (CGAP, 2012a) MFIs come in the form of nonprofit organizations, regulated financial institutions and commercial banks (MIX, 2012a). Microfinance goes back as early as the 1970's and the microenterprise movement during the seventies and eighties led to the establishment of the first NGOs that served the poor with small loans. Later in the 1990's, some of these institutions developed into formal institutions with the advantage of being able to access capital markets and to provide client savings. (CGAP, 2012b)

The microfinance sector has grown fast and the rapid development has challenged microfinance institutions all over the world. The rapid growth has led to the establishment of additional microfinance institutions, which, in turn, have made the industry more competitive. The higher level of competition between institutions has resulted in lower interest rates, lower costs, and higher efficiency, and has also opened a new market of financial services to the poor such as saving accounts and insurances. (CGAP, 2012b) The growth in the microfinance market has also opened up the opportunity for new technology, such as charge cards, ATMs and cellphones to enter the market (Cracknell, 2004). These technologies can push MFIs to become even more efficient and to cut costs. According to the results from the "Microbanking Bulletin" (2007), the average return on asset for all reported MFIs was 4.2 percent. This statistic implies that microfinance can be a profitable business. This discovery has made not only private entities interested in investing in MFIs, but also commercial banks interested in providing microloans. (MIX, 2012b)

A concern, however, is that the profit in microfinance could lead MFIs away from the poorest clients, to clients with higher income who are correlated with higher loans. Previous research strengthens the hypothesis that it is more profitable to serve clients that are better off, than to

serve the very poorest clients with very small loans. Nonetheless, this conflict might be based more on the managers' objectives than the complex balance between serving the poor and fighting poverty while at the same time generating profit. (CGAP, 2012c)

Moreover Ledgerwood (1999) states that a country's political and economic climate is critical to how the MFIs can run their operations. Government economics, social policies, and the state in which a country's financial sector is in, are together affecting the MFIs ability to provide financial services to people in need.

Furthermore, Ledgerwood (1999) describes financial systems as divided into formal, semiformal and informal sectors. In the formal sector, formal financial institutions commissioned by the government are monitored under banking regulations and supervision. Formal financial institutions consist of public and private banks, insurance firms and finance companies. The private institutions within the formal sector usually focus on urban areas, meanwhile, public institutions generally act in both urban and rural areas. The private institutions often provide large loans assigned to established private or government owned enterprises in the manufacturing industry. The private institutions from the formal sector collect the greatest amount of deposits from the general public. Public sector rural institutions often operate within the agronomy, by providing agricultural loans as a way of developing the rural sector. The sector's funding sources consist of government-distributed sources, foreign capital, secondary sources, savings and deposits. The institutions' process for transactions demands detailed paperwork and bureaucratic procedures, which result in high transaction costs and create a bias toward relatively large loans.

The semiformal sector and its operating institutions are not regulated by banking authorities but are licensed and supervised by other government agencies. Credit unions and cooperative banks are institutions operating in the semiformal sector and are often supervised by a bureau in charge of cooperatives. The semiformal sector also includes most of the non-government organizations; NGOs are considered to be legally registered units and are seen as being subject to some form of supervision or reporting requirements. A typical financial institution serves midrange clients linked together by either profession or geographic location and emphasizes deposit mobilization. The semiformal sector can be seen as a mixture between the formal and informal sector by borrowing characteristics from both sectors and providing financial services that lie between them both. In addition, many of the organizations in the

semiformal sector receive donor or government support of the country in which they operate. The support can consist of technical assistance or subventions for their operations.

The informal sector operates outside governments' supervision and regulations. The organizations within this sector consist of local moneylenders, pawnbrokers, self-help groups, some NGOs, and lending in its simplest form between family members. These organizations often operate without following the common bookkeeping standards and are concentrated on loans and deposits for small firms and households nearby. The loans are often granted without formal collateral. Hence, the informal sector substitutes the legal enforcement with the social relationships within families, villages and religious communities. The transaction costs of this sector are low and the time spent on paperwork is small. Each loan is often adapted to each client's situation.

2.2 THE STRUCTURE OF MFIS

Most MFIs start their journey as semiformal institutions, either as NGOs or as some form of savings or credit cooperative. Microfinance institutions finance their operations through three main sources: debt, equity, and deposits, if deposit utilization is allowed. For the last couple of years, debt has accounted over thirty percent of the total funding of MFIs in most of the world's regions. In particular, NBFIs and NGOs are reliant on debt as their main source of funding, while they tend to focus less on deposits. Just as important as it is to understand the main funding sources of MFIs, it is also essential to understand from where these sources arise. According to Sapundzhieva (2011) the MFIs had debt outstanding from approximately one thousand different individual counterparties in 2010. These counterparties come from a wide range of lenders such as small NGOs, large international funds, local banks and extensive government programs.

Studies on MFIs total debt financing made in 2010 show that financial institutions provided 38 percent of the total debt, meanwhile Development Financial Institutions (DFI) and funds provided 19 and 22 percent respectively (Sapundzhieva, 2011). Table 4 in Appendix goes through the funding structure evolution of MFIs between year 2007 and 2010. In addition, the level of debt financing differs a lot when comparing different regions, since political and economic climate also affect the sources of funding. Nearly 50 percent of the total funding from financial institutions was concentrated in South Asia and can be explained to a great

extent by the Indian market. India's legislation prohibits foreign investment and therefore requires Indian banks to act as investors.

Furthermore local funding may be provided by government agencies that act under development goals and provide subsidized loans. Local funding can also be provided by local banks that require commercial yield in return. As referenced in Sapundzhieva (2011), local funding can work as a good option for countries like India, particularly in regions where foreign investment is prohibited. Local funding can thus be the main source of funding under some circumstances, meanwhile in other countries the competitiveness between MFIs and local banks make the banks unwilling to provide loans to the MFIs. Research states that public funding from governments and DFIs are the cheapest source of funding for MFIs, while the most expensive form of funding comes from financial institutions. Hence, the most frequently used funder is also the most expensive. Local funding tends to be more expensive than cross-border funding because of the lack of competitiveness among local funders.

Moreover MFIs provide different types of loans to their borrowers; individual loans, group lending and village banking. Individual loans are given directly to one individual. Moreover, the group model believes that weaknesses at the individual level are overcome by the collective responsibility and security that exists in a group (i.e., the group is jointly responsible for paying back the loan). Furthermore, village banking consists of 25-50 low-income individuals who are making a joint effort to improve their quality of life through self-employment activities. (MIX, 2012a)

2.3 DEFINITIONS

2.3.1 OUTREACH

Brown et al. (2005) defines outreach as efforts made to extend microfinance services to unbanked people and can be measured in breadth or depth. Breadth measures the number of clients served and the provided volume of services, meanwhile depth measures the range of socioeconomic levels of the clients. MFIs can achieve an increase in depth of outreach by providing financial services to the most vulnerable individuals such as women and the poorest of the poor.

2.3.2 EFFICIENCY

Microfinance is a high cost business to run. The greatest challenge MFIs face today is to lower its operating costs in order to make financial services to the poor more affordable. Studies conducted on the cost structures of profitable MFIs in 2006, show that operating expenses represented 62 percent of charges to borrowers, financial expenses represented 23 percent, profits represented 10 percent and losses from defaults represented 5 percent. (González, 2007)

Rosenberg (2009) states that when measuring cost efficiency, the main focus lies on nonfinancial operating expenses such as personnel and administrative expenses in relationship to the MFIs gross loan portfolio. The ratio will give a good idea of how much MFIs earn on loans in comparison to how much they spend on providing and monitoring them. Research presented in “The Microfinance Bulletin” (2007) state that young MFIs could experience important reductions in costs during the first five to ten years of operations. After growing into mature MFIs, cost reductions usually slow down and stay at a steady level.

2.3.3 POVERTY

Ledgerwood (1999) emphasizes the importance for donors and practitioners to understand a country’s depth of poverty as well as government and donor policies towards poverty reduction. A good understanding of the market provides knowledge of the extent to which microfinance services are needed and should be provided. MFIs often have the objective to reduce poverty and to provide financial services to the poorest in the population. The poorest clients are often represented by women, which in turn have inspired many MFIs to empower women and to strengthen their position in the society. A lot of research has been conducted on poverty reduction through microfinance as well as on which clients are the most sustainable and profitable for MFIs to serve. A well-known study is one made by Hulme and Mosley (1996). The authors concluded that successful institutions are contributing effectively to reduction of poverty when acting in the middle and upper segments of the poor population. However, Hulme and Mosley (1996) came to the staggering conclusion that clients beyond the poverty line were worse off after borrowing than before. This result can explain why MFIs do not concentrate efforts towards the poorest of the poor. The depth of outreach that an MFI accomplishes does also depend to a great extent on the MFI’s ability to achieve its objective and mission. According to Ledgerwood (1999), MFIs have a great challenge in designing products and services that allow them to reach their target group.

2.3.4 CLIENT INTEREST RATES

There are several different methods used in the calculation of interest rates; the two most frequently used and accepted ones are the declining balance method and the flat method. The interest rate charged could vary significantly depending on which method that is used. Some MFIs have gone from the declining method to the flat method, but are at the same time keeping the nominal rate constant in an attempt to increase margins. This action might be a reaction to interest law regulations, which are making it impossible for MFIs to cover even their own operating costs. Most MFIs also charge their clients fees or service charges when providing a loan. These fees considerably raise the cost for the borrower while at the same time contributing to an increase in revenues for the MFIs. Fees are normally paid up front as a percentage of the total initial loan amount. MFIs also need to take the inflation in a specific region into account when setting interest rates. Inflation in developing countries can be volatile and constitutes a risk for MFIs who are often operating in countries with high inflation rates. (Ledgerwood, 1999) MFI's high interest rates and fees are often misunderstood when compared to other credit industries. Hence, an MFI's costs need to be totally covered by their interest rates and the fees paid by the clients. Previous research states that the majority of interest rates payments just covers operating costs for MFIs and is not high enough to generate any profit. (González, 2011)

2.3.5 REPAYMENT OF LOANS

The extent of repayment of loans is a good indicator of performance of MFIs. A working loan collection process is essential for a MFI to succeed and is often a good measure of management competence. A low repayment rate can almost always be traced back to bad management or system weaknesses. The strongest repayment incentives for the MFIs' clients occur to be the clients' desire to keep their future access to financial services open. Important to take into consideration is that the reporting of loan collection is complicated and the measures are not always consistent. (Rosenberg, 2009)

2.3.6 MISSION DRIFT

Armendáriz & Szafarz (2011) describes the phenomenon "mission drift" as the action when an MFI deviates from its poverty-reduction mission in an attempt to scale up. If an MFI's main objective is poverty reduction, the average loan balance can be a good measurement of outreach. When the average loan balance is low, the MFI can be interpreted as having a greater depth of outreach because of the fact that the MFI reaches out to a higher number of

poor clients. For an MFI to be able to increase its average loan balance and still act according to its mission, a MFI can either increase its average loan balance through progressive lending or cross-subsidization. Progressive lending allows existing clients to climb up to reach higher credit ceilings after demonstrating a clean repayment period for previous loans. Cross-subsidization can be explained as the action where MFIs use the profits from clients transacting in large sums of money in an attempt to be able to provide financial services to clients transacting in small sums of money. The basic nature of the service is the same and the price charged is a percentage of the amount of the transaction. Further, a mission drift occurs when an MFI increases its average loan balance by reaching out to wealthier clients without simultaneously making either a progressive lending or cross- subsidization. This action might jeopardize the very poor clients' chances for financial inclusion.

2.3.7 WOMEN AND MICROFINANCE

Microfinance can be a particular powerful tool in strengthening women's status in both their homes and communities. When women are given the main responsibility for savings and loans the ability to control their own income has shown to empower them further. Research shows that credit extended to women has a significant impact on their families' quality of life, especially their children. Poor women also tend to have the best credit ratings. In Bangladesh, for example, women have shown to default on loans far less often than men. (IFAD, 2004)

3 METHODOLOGY

The aim of this chapter is to explain the methodology that is used in this study. The focus lies on the dynamics of the Stochastic Frontier Analysis as well as on why this model has been chosen. Furthermore a motivation to the specifications of the cost and inefficiency function will be presented.

The method used in this study is replicated from the study “Outreach and Efficiency of Microfinance Institutions” performed by Hermes et al. (2008). The model is built upon the Stochastic Frontier Analysis (SFA) suggested by Battese and Coelli (1995) and further developed by Kumbhakar and Lovell (2000). The study aims at analyzing the cost efficiency of MFIs in terms of the difference in actual costs for lending activities compared to the cost of an efficient “best-practice” MFI, which means a MFI that is technically and allocatively efficient. The focus is on measuring cost inefficiency, which is done by comparing inefficiency to an efficient cost frontier³. The analysis is generated by SFA in the statistics program STATA[®]. The advantages with this model are that it estimates both the cost and the inefficiency function simultaneously through Maximum Likelihood estimation. It can also be estimated for an unbalanced panel which often adds value because of the increased number of observations that can be included in the analysis. A fixed effects estimation method is used since the data has a panel structure.

3.1 CHOICE OF MODEL - MOTIVATION

3.1.1 STOCHASTIC FRONTIER ANALYSIS VS. DATA ENVELOPMENT ANALYSIS

There are different ways of determining the efficient cost frontier and defining inefficiency. The two most mentioned methods are Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA). Coelli (2005) describes the DEA method as simpler to calculate, with the advantage that it can be applied without knowing the algebraic form of the relationship between inputs and outputs. SFA, on the other hand, assumes a given functional form for the relationship between the input and output factors and the unknown factors are estimated through econometric techniques. The two models similarity lies in the observed dataset that consists of input prices and output in the form of produced units. (Armendáriz & Labie, 2011) DEA uses a non-parametric estimation approach that does not require the functional form of the frontier. A worrying weakness in the DEA is though the lack of

³ Cost functions are not directly observable and that is why an efficient cost frontier is used to model the “best practice” MFI.

calculation of error terms, which makes the entire distance from the specific unit to the frontier to be considered as the inefficiency. This could result in overestimation of the inefficiency due to the consideration of exogenous events. (Weill, 2003)

The SFA on the other hand, is considered a parametric approach and uses econometric techniques to estimate the efficiency frontier. A weakness in the SFA method might be the consideration of a functional form of the cost function. Although many researchers argue that SFAs advantages of allowing random errors improves the estimation of the inefficiency considerably. The SFA uses a composed error model in which inefficiency is assumed to follow an asymmetric distribution, while the random errors are assumed to follow a symmetric normal distribution. (Coelli, 2005) SFA also makes it possible to examine inefficiency on a firm specific level, where the inefficiency can be related to firm characteristics like firm size, ownership, and location etcetera, and is a powerful tool for examining changes after interventions (Kumbhakar & Lovell, 2000). Considering the arguments above SFA is an advantageous method to use in the context of this study.

3.2 ESTIMATION APPROACH

3.2.1 STOCHASTIC FRONTIER ANALYSIS

The stochastic cost frontier is defined through the following properties according to the general BC model (Battese and Coelli, 1995):

$$TC_{i,t} = C(y_{i,t}, w_{i,t}, q_{i,t}; \beta) + u_{i,t} + v_{i,t} \quad (1)$$

Where $TC_{i,t}$ is the total cost MFI i faces at time t . $C(y_{i,t}, w_{i,t}, q_{i,t}; \beta)$ represents the cost frontier where $y_{i,t}$ represents the logarithm of output that MFI i faces at time t , $w_{i,t}$ is a vector of the logarithm of input prices of MFI i at time t , $q_{i,t}$ are control variables specific for every MFI and β is a vector of all the parameters to be estimated. The $v_{i,t}$'s capture measurement errors and random effects (i.e. good or bad luck) and are random errors that are assumed to be iid $N(0, \sigma_v^2)$, independently distributed of the $u_{i,t}$'s. The $u_{i,t}$'s are non-negative random variables associated with inefficiency and are assumed to be iid such that $u_{i,t}$ is obtained by truncation at zero of the normal distribution with mean $m_{i,t}$ and variance σ_u^2 .

Mathematically this is expressed as follows:

$$u_{i,t} \sim N^+(m_{i,t}, \sigma_u^2) \quad (2)$$

$$v_{i,t} \sim iid N(o, \sigma_v^2) \quad (3)$$

Note that both u and v are MFI and time specific in their nature. Furthermore the inefficiency is modeled as follows:

$$m_{i,t} = \delta_0 + \sum_n \delta_n z_{n,i,t} \quad (4)$$

Where the deltas are the parameters to be estimated and $z_{n,i,t}$ represents a vector of n variables to determine the inefficiency m of MFI i at time t .

3.3 SPECIFICATION OF THE MODEL

The specification of the cost function follows the approach of Sealey and Lindley (1977), which has been further developed by Hermes et al. (2008). This model assumes that banks act as intermediaries between surplus spending units and deficit spending units. According to Sealey and Lindley (1977), there is an important difference between banks and producing companies when considering cost structure. Producing companies have a production department that produces and supplies an output, which is then used directly as an input in another process. This output eventually culminates and ends up as the final economic output of the firm. Banks, on the other hand, incur positive costs without receiving any direct revenue. Banks have to provide depositors with services, which can be seen as a partial payment for the bank to be able to use the funds of the deposits. The implicit resource costs that are considered in this framework are capital, labor, and material costs that are used in producing services to depositors (i.e., these are the inputs that create the banks output). Thus, the variables that are used in the estimation of the cost function are salary, gross loan portfolio and the interest rate that the MFI faces, adding MFI type and loss loan rate as control variables. The cost function has a translog⁴ specification, which is specified below:

⁴ Translog specification allows the technological change effect to increase or decrease with time. See Coelli (2005) Chapter 8.

$$\begin{aligned}
\ln(TC_{i,t}) = & \beta_0 + \beta_1 \ln(SALARY_{i,t}) + \beta_2 \ln(R_{i,t}) + \beta_3 \ln(GLP_{i,t}) \\
& + \beta_4 \ln(SALARY_{i,t})^2 + \beta_5 \ln(R_{i,t})^2 + \beta_6 \ln(GLP_{i,t})^2 \\
& + \beta_7 \ln(SALARY_{i,t}) \ln(R_{i,t}) \\
& + \beta_8 \ln(SALARY_{i,t}) \ln(GLP_{i,t}) + \beta_9 \ln(R_{i,t}) \ln(GLP_{i,t}) \\
& + \beta_{i=10..14} LS_{i,j} + \beta_{15} LLR_{i,t} + u_{i,t} + v_{i,t}
\end{aligned} \tag{5}$$

Where TC represents the total costs a MFI is faced with, SALARY represents the yearly cost of one unit of labor, R is the interest rate paid for holding money, GLP is the gross loan portfolio, LS refers to the legal status of the MFI⁵, and LLR refers to loan loss rate, hence every variable is MFI and time specific. SALARY and R are the inputs, while GLP is the output of the MFI. As can be seen, the TC specification takes the individual input and output variables into account as well as the square of the variables and combinations of them. The coefficient estimates for the cost function are expected to be positive, which implies an outward shift in the cost function.

To be able to control the effect for different legal status as well as for different risk taking strategies (Fries and Taci, 2004), the dummy-variables LS and LLR are added to the regression. LS is an important control variable due to the difference in levels of subsidies that are received from external sources by different types of MFIs. The dummy variables that are included under LS in the analysis are: banks (BANK), cooperatives (COOP), non-bank financial institutions (NBFI), non-governmental organizations (NGO), rural banks (RURBANK) and other organizations (OTHER). The coefficients for input and output are expected to stay significant after adding the control variables. Significant coefficients for the control variables are implying a significant impact on the total cost of a MFI.

Note that the aim of this thesis is not to specify a new model, but to test and interpret the model specified by Hermes et al. (2008) on the data sample of this study. The main focus is on the inefficiency equation, which is the reason to why the full specification of equation (5) is used in all specifications of the model.

⁵ i.e., Bank, Cooperative, NBFI, NGO, Rural bank or Other.

3.3.1 MEASURING INEFFICIENCY

As mentioned before, the aim of this thesis is to investigate the trade-off between outreach and efficiency in the microfinance market. The specification of the inefficiency model is done by using a specific-to-general approach (Brooks, 2008). The specification starts with allowing the mean of the inefficiency term, $m_{i,t}$ to be modeled as a linear function of a set of covariates. The relationship between efficiency and outreach is modeled by setting the inefficiency $m_{i,t}$, as the dependent variable and by having a number of measures of outreach on the right hand side of the empirical model. A number of control variables are also included as dummies to test if the model holds when adding these conditions. The model is specified in two ways⁶:

$$m_{i,t} = \delta_0 + \delta_1 \ln ALB + \delta_2 \ln WOMAN + \delta_3 YEAR + \delta_4 AGE + \delta_{i=5,6} OUTREACH_t \quad (6)$$

$$m_{i,t} = \delta_0 + \delta_1 \ln ALB + \delta_2 \ln WOMAN + \delta_3 YEAR + \delta_4 AGE + \delta_{i=5\dots 9} REGION_t \quad (7)$$

Where $m_{i,t}$ stands for the first moment of the inefficiency distribution for MFI i at time t . The higher the $m_{i,t}$, the more inefficient the MFI is. ALB stands for average loan balance and WOMEN gives information on the gender of the borrower; both are standard measures of outreach according to Hermes et al. (2008) and are essential to the analysis. The coefficient for ALB is expected to be negative which implies that MFIs with higher ALB are more efficient. A high percentage of WOMEN is a measure of outreach because of the fact that women usually represent the very poorest individuals (Ledgerwood, 1999). WOMEN is expected to generate a positive coefficient, implying a greater level of inefficiency when reaching out primarily to females. The control variables are vectors of dummy variables. The first control variable included in the specification is YEAR, which is a dummy variable ranging from 1-8⁷. This dummy controls for the possibility that inefficiency effects can change over time, because of the fact that the study stretches over the years 2003 until 2010⁸. The age of the MFI is measured by the dummy variable AGE which makes it possible to test

⁶ The model is specified in two ways because it is impossible to maximize the equation when including both REGION and OUTREACH in the same specification.

⁷ This dummy is modeling the linear relationship YEAR adds to the specification.

⁸ The study was at first thought to range from 2000-2010, but after dropping observations to get a balanced panel there were only 5 observations present during 2000-2002. More on this topic is available under Data in this chapter.

the hypothesis if older MFIs are more efficient than younger ones due to more experience. AGE is divided into three dummy variables: New, Young and Mature⁹. A negative coefficient implies that older more mature MFIs are more efficient due to more experience. Control variables are also added to check for the impact of different depths of outreach and for controlling the impact of operating in different regions. Hermes et al. (2008) also adds dummy variables for different types of lending. These dummy variables are left out of this study because of the difficulty in downloading this information in bulk. According to Gaul (2012), this is no longer as important since most MFIs offer their clients mixed lending alternatives and hence, would probably not give any significant results in the final analysis of this study.

3.4 DATA

The dataset used in this study consists of a panel dataset collected from MixMarket, which is a Microfinance Information Exchange that provides global, reliable and relevant data from the microfinance market to private investors, researchers and businesses. This study investigates data on MFIs from all over the world, more specifically: Africa, East Asia and The Pacific (EAP), Eastern Europe and Central Asia (EECA), Latin America and The Caribbean (LAC), Middle East and North Africa (MENA) and South Asia (SA). The initial sample contained over 10 000 observations and the examination period was originally planned to range from year 2000 – 2010. After dropping observations without full information¹⁰ for all of the variables included in the analysis, the sample was limited to 1679 observations. The first three years only resulted in 5 observations in total, and for this reason the observations of the first three years were dropped, resulting in a sample of 1674 observations for a time period ranging from 2003 – 2010. The reason why 2011 is not included is the problem with lag in information between MFIs and MixMarket. When looking at 2011's data, it is clear that it does not follow previous trends which could cause biased results. In the report "State of the Microcredit Summit Campaign Report 2011" by L.R. Reed, it is also obvious that the data from MFIs lag with approximately one year, which ratifies the choice of examination period. Some of the variables that are used in the analysis are not directly observable in MixMarket's dataset and have been calculated as follows: TC is measured as the total expense to total asset ratio times total assets, SALARY is the operating expenses to total assets ratio times total assets, divided by the total number of employees, R is the financial expenses to total assets

⁹ New = 0 to 4 Years; Young = 5 to 8 Years; Mature \geq 8 Years.

¹⁰ To get a balanced data set.

ratio divided by the total deposits to total assets, and GLP is the gross loan portfolio to total assets ratio times total assets, all stated in US dollars. Worth noticing is that Hermes et al. (2008) use the variable LLR as loan loss reserves while this study use the same notation for loan loss rate (i.e., the coefficients for these variables should not be interpreted in the same way). A correlation matrix between all variables used in the analysis can be viewed in Matrix 1 in Appendix.

4 RESULT AND ANALYSIS

This chapter analyzes the results from the Stochastic Frontier Analysis where the main focus is on the specification of the inefficiency function. Commonly used variables for outreach are used to measure the compatibility between outreach and efficiency, as well as different sets of control variables, which are constructed as dummies. The results are compared to the results of Hermes et al. to determine if there have been any significant changes in efficiency parameters since their study was conducted in 2008.

All specifications are stated in Table 5. The Table is divided in two parts; Section A, which specifies the cost function and Section B, which specifies the inefficiency function. Each column specifies a unique specification of the model. Note that the cost function is always specified as in equation (5) in the previous chapter. Columns 1-3 are the generated estimations for the outreach variables ALB and WOMEN and columns 4-7 are the estimations with the added control variables.

Even though the main focus of this study is on the inefficiency function, the analysis starts with a minor analysis of the results generated for the cost function. Generally, SALARY generates a positive and significant result, as expected. SALARY even has the strongest result of all the explanatory variables if taking all the different specifications into account. Microfinance is a high cost business with operating expenses accounting for as much as 62 percent of their charges to borrowers. Furthermore, in this study, the coefficient for R is positive but never significant. This result is not in line with the results of Hermes et al. who generated a negative and significant result for R, though this result was unexpected. Hermes et al. investigated this result further with the delta method, and were then able to determine a positive impact of R on the cost function. R is considered a main cost for MFIs and should logically have an impact on total cost. But in comparison to SALARY, R only stands for 23 percent of the MFI's charges to borrowers which could explain why R's coefficient is not as significant as SALARY's. R is also different depending on what type of legal status (LS) the MFI is subject to. The financial expense depends on what type of funding alternative the MFI chose, as well as what kind of institution the MFI chose for funding its debt. Banks mainly fund their operations with deposits, which is a cheap funding alternative, while NGOs fund almost half of their operations with debt. Because MFIs with different LS face different cost structures and financial expenses for funding, this difference is accounted for by the dummy

variables LS which has negative and significant coefficients in all specifications. This result implies that there is indeed a difference in cost structure depending on the LS to which the MFI is subject. Thus, one explanation for the insignificant R maybe that the dummy LS takes the difference in expenses into account. Also GLP has insignificant results to some extent for the same reasons as R. Yet, several of the interaction and quadratic terms for GLP are significant, implying that GLP still has an impact on the TC. The GLP is logically correlated to what type of legal status an MFI is subject to, and this is why the output also could be accounted for in the dummy variables for LS. The negative sign indicates that the greater the GLP of the MFI, the lower the cost¹¹. This result is not in line with the results of Hermes et al. (2008) who generated negative and significant results for all coefficients of GLP. Moving forward, the second control variable LLR is always highly positive and significant indicating that the loan loss rate does have a great impact on the cost of the MFI, as expected. This cost accounts for approximately 5 percent of MFI's charges to borrowers. It is also important to note that the LLR is affected by what type of LS the MFI is subject to, see Table 6 for the mean LLR by LS.

Even if some of the coefficients lack significant result, they all have a financial logical explanation. Because of this reason, the main focus is not on the cost but on the inefficiency function, and the specification used by Hermes et al. will still be used for further analysis. The inefficiency and the cost function are generated simultaneously with the help of STATA. The mean of the inefficiency term is modeled as a linear function of a set of outreach covariates. The first covariate considered is ALB which generates a negative and significant coefficient. This result is as expected and is in line with the results of Hermes et al. In practice, it means that the greater the average loan balance per borrower, the more efficient the MFI is. If the MFI's main purpose is poverty reduction, the MFI has to stick to its main mission if it does not want to experience a mission drift which is not a desired result. When a MFI increases its average loan balance by reaching out to wealthier clients without simultaneously engaging in either progressive lending or cross-subsidization, this action could seriously jeopardize the very poor clients' chance for financial inclusion and harms outreach. Continuing to the second specification, ALB is replaced with the commonly used outreach variable WOMEN. The coefficient change sign and the result is positive and significant, suggesting that the higher the percentage of women borrowers, the higher the inefficiency of the MFI. Also this result is in

¹¹ Specification (3) and (5) does not have a negative sign, though the result does not hold for these specifications.

line with the replicated study. Adding both of the variables ALB and WOMEN to the third specification, the results for ALB stay negative and significant while WOMEN is now insignificant, though just slightly¹². This could be a sign that women borrowers are no longer as strong as a contributor to inefficiency as they have been in the past. This could be due to all of the efforts that have been made in recent years to empower women in developing countries. Women have also become desired clients among MFIs after proving to be much better at repaying their loans than men in general.

Furthermore, a variety of control variables are included in the regression, starting with the variable YEAR. The regression comes out positive and significant, which indicates that MFIs have not become more efficient in recent years. This result is not in line with the result of Hermes et al., but could be explained by the great portion of mature MFIs that are present in the sample of this study. Table 7 in Appendix presents the number of MFIs of this study by age. MFIs generally experience a great deal of growth and cost reduction during the first five to ten years of their operations. When the MFIs reach the stage of a mature institution, they also reach a steady state with regard to costs. This might explain why this study does not show any significant rise in efficiency in later years. AGE is negative and significant, indicating that older more experienced MFIs are more efficient. This could be due to the fact that older MFIs have had time to learn from their mistakes and have a better knowledge about the industry in general. Younger MFIs might have difficulty catching up with older ones in terms of experience and knowledge. Worth noticing, however, is that there might be a bias because of the large portion of mature MFIs that are included in this study. Moving on to the sixth specification, the control variable OUTREACH is included with strong significant results. This supports the hypothesis that different depths of outreach does have a significant impact on the inefficiency of MFIs. The last specification tests if the inefficiency is due to any regional effects. All coefficients in this specification are strongly significant, indicating that it does matter in what region the MFI is operating. This result was expected since major differences in political and economic climate are present around the world. An example is India which prohibits foreign investment and therefore requires India's banks to act as investors. The lack of competitiveness makes funding more expensive for not only Indian MFIs, but also Indian borrowers. In contrast to this study, Hermes et al. did not find any significant results for regional effects.

¹² WOMEN will be kept in the further specification of the model even if it is not significant. This is due to the fact that it is considered an important measure of outreach.

4.1 CRITICAL DISCUSSION

It is a widely accepted notion among researchers that some kind of limitation has to be made in order to get a more manageable dataset. In this study the sample is reduced by approximately 80 percent which is at the limit to what is reasonable. From a critical perspective it can be argued that the reduced sample could cause biases towards more developed and mature MFIs. Criticism can also be directed at the specification of both the cost and the inefficiency function. Because of the insignificant results for some of the coefficients the model cannot be considered statistically reliable. It is though important to think of a regression like a team of variables, some work well together and some work well alone. Even if a coefficient has an insignificant result it can still add relevance to the model. Furthermore it is always hard to interpret the results of dummy variables; this is the reason to why this study focuses on if the dummy is significant or not i.e. if it does have an impact on the cost and inefficiency function.

5 CONCLUSION

This thesis has used SFA to examine the compatibility between outreach to poor clients and the efficiency of MFIs. By using a sample of 1674 observations from countries worldwide it can be concluded that outreach and efficiency of MFIs are negatively correlated. More specifically, MFIs with a lower average loan balance, which is a measure of the depth of outreach, also experience a lower level of efficiency. This result stays robust through all of the specifications. Furthermore it can be suspected that a higher percentage of women borrowers do not contribute to inefficiency as much as it have done in the past. This suspicion arises from the inconsistent results, which are generated by the different specifications of inefficiency. It can thus be concluded that there has been some development in the microfinance market since Hermes et al. (2008) conducted their study.

After the rapid growth in microfinance in recent years a desired result would be to see a greater depth of outreach as well as a higher level efficiency of MFIs. Referring back to the fact that lower average loan balance is subject to a lower level of efficiency, this is unfortunately not what can be seen according to the results of this study. It can also be concluded that a wide range of both internal and external factors affects the inefficiency of MFIs. MFIs have not become more efficient in recent years, and the mature MFIs are the ones that are the most efficient. MFIs also experience different levels of inefficiency depending on what region they are operating in, mainly because of differences in legislation and policies but also because of land specific characteristics.

For MFIs to become more efficient it would require them to lower the operating costs, which are swallowing a huge amount of the income they generate. Standardization of the MFIs processes could be one answer to this problem, but could also give raise to a range of other problems. A high loan loss rate can be traced back to larger institutions with standardized processes. Hence, one of the challenges MFIs faces is to streamline the operating process in an effort to lower costs, which in turn could make financial services more affordable to poor individuals. A lot of investigating research has been made on efficiency of MFIs and what it may lead to, but there has not been any efforts made on trying to find a way in practice on how MFIs could reach out to more poor individuals and at the same time become more efficient. This type of research would be very valuable to the industry and could help reach poverty-reduction goals in the future.

An ending note concerning the recent growth of microfinance is that the commercialization does not necessarily mean that MFIs will become more efficient. Different actors in the microfinance market have different financial and personal objectives. Thus the recent growth has made the demand for transparency and information even more important than ever. This is indeed a desirable development both from an investor point of view as well as to avoid potential exploitation of the poor.

Microfinance has come a long way in recent years, but still has a long way to go. Transparency in combination with responsible investors and institutions as well as new technology, innovative programs and financial services, will hopefully lead to reduced poverty and greater prosperity around the world in a near future.

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7 APPENDIX

7.1.1 TABLE 1: LEGAL STATUS BY YEAR

Year	Legal Status						Rural Bank	Total
	Bank	Coop	NBFI	NGO	Other			
2003	12	9	16	14	1	3	55	
2004	21	12	27	20	2	6	88	
2005	32	24	51	43	2	10	162	
2006	38	49	65	65	2	16	235	
2007	42	71	72	69	3	11	268	
2008	44	95	76	53	1	35	304	
2009	36	73	82	76	2	29	298	
2010	41	59	81	61	3	19	264	
Total	266	392	470	401	16	129	1,674	

7.1.2 TABLE 2: LEGAL STATUS BY REGION

Region	Legal Status						Rural Bank	Total
	Bank	Coop	NBFI	NGO	Other			
Africa	43	148	144	135	0	16	486	
EAP	15	10	58	92	15	105	295	
EECA	66	67	10	1	0	0	144	
LAC	112	161	214	91	0	0	578	
MENA	0	0	4	19	0	0	23	
SA	30	6	40	63	1	8	148	
Total	266	392	470	401	16	129	1,674	

7.1.3 TABLE 3: AVERAGE LOAN BALANCE BY LEGAL STATUS

LS	ALB		
	mean	min	max
BANK	1773,47	36	23866
COOP	1585,33	13	9744
NBFI	890,13	17	8464
NGO	344,73	14	2954
Other	259,38	58	832
RURAL	651,17	14	4501
Total	1038,20	13	23866

7.1.4 TABLE 4: FUNDING STRUCTURE EVOLUTION, 2007-2010

Variable	2007	2008	2009	2010
Debt	30,90%	33,38%	32,21%	28,79%
Deposits	42,09%	44,06%	44,88%	47,56%
Equity	18,08%	17,69%	17,66%	18,29%
Other				
Liabilities	8,93%	4,87%	5,25%	5,36%

(Sapundzhieva, 2011, Figure 1)

7.1.5 TABLE 5: RESULTS OF THE ESTIMATIONS

SECTION A COST FUNCTION	1	2	3	4	5	6	7
SALARY	1,351 *** 0,061	1,212 *** 0,062	1,245 *** 0,072	1,259 *** 0,068	1,249 *** 0,067	1,269 *** 0,060	1,266 *** 0,063
R	0,012 0,066	0,032 0,068	0,045 0,066	0,055 0,066	0,058 0,065	0,038 0,065	0,052 0,065
GLP	-0,137 ** 0,076	-0,012 0,084	0,032 0,104	-0,003 0,096	0,006 0,095	-0,201 *** 0,077	-0,053 0,085
SALARY2	-0,021 *** 0,004	-0,020 *** 0,004	-0,025 *** 0,004	-0,025 *** 0,004	-0,024 *** 0,004	-0,030 *** 0,004	-0,023 *** 0,004
R2	-0,002 0,002	-0,001 0,002	-0,001 0,002	-0,001 0,002	-0,001 0,002	-0,001 0,002	-0,004 ** 0,002
GLP2	0,043 *** 0,003	0,037 *** 0,004	0,034 *** 0,005	0,036 *** 0,004	0,036 *** 0,004	0,036 *** 0,003	0,039 *** 0,004
GLP*R	0,004 0,005	0,003 0,005	0,003 0,005	0,002 0,005	0,003 0,005	0,002 0,005	0,004 0,005
GLP*SALARY	-0,044 *** 0,006	-0,038 *** 0,006	-0,032 *** 0,007	-0,033 *** 0,007	-0,034 *** 0,007	-0,025 *** 0,007	-0,037 *** 0,006
SALARY*R	-0,005 0,004	-0,006 0,005	-0,006 0,004	-0,006 0,004	-0,007 * 0,004	-0,005 0,004	-0,007 0,004
COOP	-0,530 *** 0,042	-0,577 *** 0,041	-0,536 *** 0,040	-0,541 *** 0,040	-0,505 *** 0,042	-0,497 *** 0,043	-0,531 *** 0,040
NBFI	-0,198 *** 0,038	-0,197 *** 0,038	-0,194 *** 0,037	-0,202 *** 0,037	-0,183 *** 0,037	-0,207 *** 0,038	-0,228 *** 0,037
NGO	-0,326 *** 0,043	-0,339 *** 0,044	-0,365 ** 0,045	-0,377 *** 0,045	-0,325 *** 0,047	-0,318 *** 0,046	-0,390 *** 0,044
OTHER	-0,303 *** 0,124	-0,252 *** 0,126	-0,270 *** 0,133	-0,282 *** 0,133	-0,242 ** 0,132	-0,305 *** 0,121	-0,336 *** 0,133
RURAL BANK	-0,394 *** 0,055	-0,391 *** 0,054	-0,358 *** 0,053	-0,370 *** 0,054	-0,315 *** 0,055	-0,326 *** 0,057	-0,361 *** 0,057
LLR	2,998 *** 0,223	3,138 *** 0,221	3,044 *** 0,216	2,996 *** 0,215	2,978 *** 0,215	2,837 *** 0,218	2,952 *** 0,211
Constant	1,670 *** 0,629	1,634 *** 0,667	0,753 0,707	0,967 0,687	0,829 0,679	2,968 *** 0,729	1,240 *** 0,638

SECTION B											
INEFFICIENCY	1	2	3	4	5	6	7				
ALB	-0,113 ***		-0,300 ***	-0,300 ***	-0,264 ***	-0,039 ***	-0,234 ***				
	<i>0,013</i>		<i>0,086</i>	<i>0,086</i>	<i>0,065</i>	<i>0,017</i>	<i>0,043</i>				
WOMEN		1,998 ***	0,137	0,137	0,127 *	0,039	0,142 **				
		<i>0,549</i>	<i>0,096</i>	<i>0,096</i>	<i>0,075</i>	<i>0,024</i>	<i>0,073</i>				
YEAR				0,030 **	0,031 ***	0,018 ***	0,029 ***				
				<i>0,016</i>	<i>0,015</i>	<i>0,007</i>	<i>0,012</i>				
AGE					-0,172 ***	-0,083 ***					
					<i>0,056</i>	<i>0,023</i>					
Medium						-0,110 ***					
						<i>0,039</i>					
Large						-0,437 ***					
						<i>0,062</i>					
EAP									-0,240 ***		
									<i>0,074</i>		
EECA									-0,484 ***		
									<i>0,190</i>		
LAC									-0,322 ***		
									<i>0,078</i>		
MENA									-0,596 ***		
									<i>0,237</i>		
SA									-0,636 ***		
									<i>0,143</i>		

Standard errors in *italics*

* Significant at 10%; ** significant at 5%; *** significant at 1%

7.1.6 TABLE 4: LOSS LOAN RATE BY LEGAL STATUS

Legal Status	LLR (mean)
BANK	2,44%
COOP	1,14%
NBFI	2,13%
NGO	2,86%
Other	0,73%
RURAL	0,85%

7.1.7 TABLE 5: NUMBER OF MFIS BY AGE

AGE	Freq.	Percent	Cum.
Mature	1,267	75.69	75.69
Young	290	17.32	93.01
New	117	6.99	100.00
Total	1,674	100.00	

7.1.8 MATRIX 1: CORRELATION TABLE

	TC	Salary	R	GLP	Salary2	LnR2	LnGLP2	LnGLPR	LnGLPS~y	LnSaLa~R	ALB	Women
TC	1.0000											
Salary	0.6608	1.0000										
R	0.0658	-0.0044	1.0000									
GLP	0.9334	0.6183	0.0215	1.0000								
Salary2	0.6260	0.9929	-0.0067	0.5918	1.0000							
LnR2	-0.1419	-0.0569	-0.5699	-0.1043	-0.0481	1.0000						
LnGLP2	0.9379	0.6433	0.0095	0.9958	0.6200	-0.0944	1.0000					
LnGLPR	-0.0891	-0.1034	0.9794	-0.1455	-0.1000	-0.5148	-0.1554	1.0000				
LnGLPSalary	0.8073	0.9601	-0.0018	0.8039	0.9534	-0.0708	0.8253	-0.1321	1.0000			
LnSalaryR	-0.1195	-0.2604	0.9468	-0.1510	-0.2594	-0.4938	-0.1680	0.9682	-0.2519	1.0000		
ALB	0.3351	0.2022	-0.0822	0.4223	0.1650	0.0051	0.4214	-0.1558	0.2850	-0.1386	1.0000	
Women	-0.1088	-0.0348	0.1454	-0.1578	-0.0252	-0.1075	-0.1588	0.1738	-0.0787	0.1514	-0.3634	1.0000
BANK	0.4437	0.3437	0.0060	0.3877	0.3410	-0.0590	0.4041	-0.0470	0.3969	-0.0830	0.2038	-0.1564
COOP	-0.1720	-0.0722	-0.2976	-0.0770	-0.0900	0.2496	-0.0796	-0.2858	-0.0879	-0.2601	0.3148	-0.1947
NBFI	0.1071	-0.0264	0.1483	0.0825	-0.0263	-0.1173	0.0763	0.1366	0.0068	0.1462	-0.0359	0.0649
NGO	-0.2136	-0.1122	0.1683	-0.2532	-0.0982	-0.0754	-0.2533	0.1993	-0.1673	0.1865	-0.4199	0.3311
OTHER	-0.0373	-0.0548	0.1263	-0.0369	-0.0504	-0.0590	-0.0400	0.1308	-0.0524	0.1226	-0.0837	0.0691
RURAL	-0.1607	-0.1128	-0.1004	-0.1302	-0.1050	0.0240	-0.1367	-0.0778	-0.1296	-0.0620	-0.0174	-0.1397
Large	0.6502	0.4219	0.0185	0.6368	0.4235	-0.0725	0.6479	-0.0832	-0.5379	-0.0981	-0.0736	0.0409
Medium	-0.0323	-0.1721	0.1011	-0.0433	-0.1779	-0.0591	-0.0652	0.1038	-0.1489	0.1381	-0.0672	0.0239
Small	-0.6157	-0.2612	-0.1109	-0.5924	-0.2575	0.1261	-0.5833	-0.0125	-0.3975	-0.0291	0.1345	-0.0625
New	0.2269	0.1148	0.0115	0.2978	0.1071	-0.0089	0.2942	-0.0427	0.1876	-0.0283	0.1418	0.0028
Young	-0.1133	-0.0283	-0.0315	-0.1772	-0.0236	0.0116	-0.1701	0.0040	-0.0812	-0.0074	-0.0760	-0.0531
Mature	-0.1808	-0.1111	0.0082	-0.2181	-0.1056	0.0023	-0.2188	0.0456	-0.1580	0.0371	-0.1095	0.0325
Africa	-0.1794	-0.1426	-0.3257	-0.2212	-0.1361	0.3177	-0.2220	-0.2836	-0.1815	-0.2628	-0.1840	-0.0571
EAP	-0.1992	-0.1654	0.0791	-0.1918	-0.1371	-0.0652	-0.1952	0.1148	-0.1806	0.1186	-0.2586	0.1111
ECCA	0.0315	0.0494	0.1327	0.0385	0.0366	-0.1365	0.0392	0.1256	0.0434	0.1110	0.3018	-0.1553
LAC	0.2885	0.1967	0.1210	0.3086	0.1664	-0.1274	0.3105	0.0598	0.2456	0.0539	0.3927	0.0158
MENA	-0.0945	-0.0660	0.0546	-0.0772	-0.0585	0.0091	-0.0750	0.0716	-0.0715	0.0622	-0.0465	0.0507
SA	0.0776	0.0980	0.0583	0.0868	0.1100	-0.0752	0.0880	0.0458	0.1069	0.0356	-0.2960	0.0486
	BANK	COOP	NBFI	NGO	OTHER	RURAL	Large	Medium	Small	New	Young	Mature
BANK	1.0000											
COOP	-0.2409	1.0000										
NBFI	-0.2718	-0.3458	1.0000									
NGO	-0.2437	-0.3101	-0.3498	1.0000								
OTHER	-0.0428	-0.0544	-0.0614	-0.0551	1.0000							
RURAL	-0.1259	-0.1601	-0.1807	-0.1620	-0.0284	1.0000						
Large	0.2602	-0.1971	0.0814	-0.0366	0.0159	-0.1280	1.0000					
Medium	-0.0671	-0.1017	0.0889	0.0611	0.0100	0.0025	-0.4529	1.0000				
Small	-0.1968	0.2887	-0.1621	-0.0196	-0.0250	0.1248	-0.5778	-0.4659	1.0000			
New	-0.1037	0.0114	-0.0706	0.0725	-0.0015	0.1276	0.2103	-0.0382	-0.1737	1.0000		
Young	0.1114	-0.0301	0.0530	-0.0767	-0.0270	-0.0618	-0.1177	-0.0175	0.1328	-0.4836	1.0000	
Mature	0.0425	0.0073	0.0443	-0.0306	0.0198	-0.1029	-0.1590	0.0551	0.1074	-0.8076	-0.1257	1.0000
Africa	-0.1228	0.1073	0.0210	0.0570	-0.0628	-0.1056	-0.1047	0.0612	0.0479	-0.1110	0.0678	0.0801
EAP	-0.1371	-0.2193	-0.0866	0.0794	0.1962	0.4835	-0.0232	0.0358	-0.0097	0.1018	-0.0594	-0.0754
ECCA	0.2511	0.1672	-0.1444	-0.1670	-0.0302	-0.0888	-0.1102	-0.0459	0.1513	-0.1586	0.0411	0.1521
LAC	0.0687	0.0754	0.1450	-0.1387	-0.0715	-0.2103	0.0527	-0.0074	-0.0455	0.1606	-0.0713	-0.1339
MENA	-0.0503	-0.0639	-0.0254	0.1570	-0.0114	-0.0334	-0.0647	0.0369	0.0304	-0.0812	0.0095	0.0857
SA	0.0371	-0.1428	-0.0072	0.1367	-0.0090	-0.0270	0.2448	-0.1027	-0.1489	-0.0390	0.0465	0.0129
	Africa	EAP	ECCA	LAC	MENA	SA						
Africa	1.0000											
EAP	-0.2957	1.0000										
ECCA	-0.1961	-0.1422	1.0000									
LAC	-0.4644	-0.3367	-0.2233	1.0000								
MENA	-0.0738	-0.0535	-0.0355	-0.0840	1.0000							
SA	-0.1991	-0.1443	-0.0957	-0.2267	-0.0360	1.0000						