

Determinant of Micro Finance Outreach in Ethiopia



College of Business and Economics
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Research paper Submitted to the Department of Accounting and Finance for the Partial Fulfilment of Bachelor of Art (BA) in Accounting and Finance.

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JANUARY, 2021

Wolkite, Ethiopia

Statement of declaration

I, Yosef bekabil declare that this thesis entitled The determinants of microfinance outreach: an empirical study on Ethiopian institutions is outcome of my own effort and study and that all sources of material used for the study have been duly acknowledged. I have produce independently except for the guidance and suggestion of the thesis advisor.

To the best of my knowledge, this study has not been submitted for any degree in this university or any other university. It is offered for partial fulfilment of bachelor of art(BA) in accounting and finance.

ABSTRACT

Microfinance institutions (MFIs) are developed to provide financial services to poor people usually ignored by commercialized institutions. Their main purpose is to increase outreach both in terms of depth by providing small loans and reaching maximum number of poor people. This study aims to study the factors that influence the outreach performance of MFIs in Ethiopia. By using random effect regression, factors that influence the depth and breadth of outreach were determined. The MF industry as a whole is challenged by the need to reach the poorest customers and at the same time needs to have depth. The study found that microfinance; portfolio at risk, size of MFIs, borrower per loan officer, return on equity and operating expense ratio affect the outreach of microfinance institution in Ethiopia. This study recommends microfinance institutions to consider more numbers of borrowers, find ways of serving the borrowers at the lowest possible operating expense, be able to control their portfolio to generate more return with reaching out to the poorest customer. This study is based on quantitative research approach using panel data as a main data analyses technique. The study was based on a 9 years secondary data obtained from association of microfinance and mix market data base for selected 12 microfinances. The study found that grant to age of microfinance, size of micro finance, return on equity, portfolio at risk, prating expense ratio, affect the microfinance outreach in Ethiopia. Finally, it has been recommended that they should increase the value of their total assets.

Key words: microfinance, outreach, return on equity, portfolio

Acknowledgements

On top of all glory is to God for allowing and giving me the strength to complete this study. Without his permission, I would not be able to complete this study. Secondly, I would like to express my gratitude to my advisor **Dr.roa** for his help, willingness and commitment in giving his precious time to help me to accomplish this research. I would like to express my gratitude to my special mother for her continuous support, encouragement and praying for my success. I haven't word to say thank you for my friends. Finally, I want to thank all directly or indirectly participated in the accomplishment of the study.

ACRONYMS

AEMFIs: Association of Ethiopia Micro Financial Institutions

AGE: Age of a MFI

ALS: Average loan size

BLO: Borrower per loan officer

BRDOUT: Breadth of Outreach

DBOUT: Depth of Outreach

DW: Durban Watson

FSS: Financial Self-Sufficiency

GDP: Gross Domestic Product

MFI: Micro financial Institution

NAB: Number of active borrowers

NBE: National Bank of Ethiopia

OER: Operating Expense Ratio

OLS: Ordinary List Square Method

OSS: Operational Self-Sufficiency

PAR: Portfolio at Risk ROE: Return on equity

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Microfinance institutions (MFIs) worldwide are striving to reach out to a large number of active clients and at the same time ensure coverage for those living with high relative poverty levels with minimal average loan balance (depth of outreach) with financial services needed for both consumption and enterprise development. The breadth of outreach is related to the actual number of poor people reached with financial services, while the depth of outreach is how deep within the poor population an MFI is able to reach with minimal Average loan. (befekadu b.keteta 2007).

Extension of microfinance services to more clients has received much attention in recent times following liberalization of financial policies, adoption of better lending techniques, mobilization of deposits and the application of communication technologies that reduce transaction costs in the microfinance sector. The exponential growth of the industry has contributed significantly to improved social welfare, job creation, enterprise development and the general financial health of most economies. The value of loan portfolios, number of savers and borrowers has recorded dramatic increases. (Hermes, Lensink&Meesters 2011).

However, despite these achievements in outreach, most of the population in the African continent as well as most developing nations in other parts of the world still do not have access to basic financial services (African Union 2009; Cull et al. 2009). The continent continues to wallow in the path of under-development financially (Honohan& Beck 2007). Microfinance which is seen as a poverty reduction tool has come under criticism in recent years for limited evidence of impacts on clients' lives and scale, despite claims of the fast-expanding industry. For instance, Bateman (2014:5) described microcredit in South Africa as 'one of the most calamitous programs me interventions in the post-apartheid era' for lack of impacts and the dangers it poses to the country's financial system.

Yet, few studies have analysed the factors that influence microfinance outreach. Most of the existing studies (Ahlin, Lin &Maio 2011; Hudak 2012; Vanroose 2008) that examined this subject matter approach it from the macroeconomic perspective. The only exception is the work of Osoimehin, Jegede and Akinlabi (2011), which examines the determinants of MFIs in South Western Nigeria using firm level variables. Analysing the factors that drive MFI

outreach comprehensively is relevant as it would support both firm level and macro-level policy decisions that affect industrial operations of MFIs.

Ethiopia is one of the least developed countries. The per capita income of the country, though it showed improvement in recent years, is only USD 180 as at end of 2005/06(NBE). Most of the poor, which mainly argued to be constrained by absences of credit access, participant in some kind of informal sector ranging from small petty trading to medium scale enterprises. (NBE,2010).

Microfinance are one of the formal financial institutions that provide financial service to the poor and rural areas with high interest rate to componset for the risk. Worlds bank strategy seeks to improve the demand and supply conditions. for expanding access of rural poor to a suitable diversity of productions and institutions that fill the financial needs of low-income rural clients in income generation and reduction of vulnerability (world bank,2002)

Several micro finance institutions (MFIs) have established and have been operating towards resolving the credit access problem of the poor. From 2004 to 2010, MFIs in Ethiopia rose from 16 to 32 while the total number of clients increased to average 22.9 %. However, despite these achievements in outreach, up to 80% of the population in Ethiopia still do not have access to basic financial services (NBE, 2010).

In light of this study, therefore, addresses two key questions: (1) is there a trade-off between depth of outreach and breadth of outreach? (2) Which institutional level factors influence MFIs outreach in Ethiopia? Understanding these dimensions of outreach is important in tackling the challenge of financial inclusion which is being pursued across continents. This study makes the first step in this direction by providing empirical evidence that sheds new insights on outreach performance of MFIs in Ethiopia.

1.2 Statement of the Problem

Ethiopia is one of the least developed countries. The per capita income of the country, though it showed improvement in recent years, is only USD 180 as at end of 2005/06(NBE). Most of the poor, which mainly argued to be constrained by absences of credit access, participant in some kind of informal sector ranging from small petty trading to medium scale enterprises. Several micro finance institutions (MFIs) have established and have been operating towards resolving the credit access problem of the poor. However, despite these achievements in

outreach, up to 80% of the population in Ethiopia still do not have access to basic financial services (NBE, 2010).

This study was focused on the determinants of depth of microfinance institution in Ethiopia. Microfinance has been operational since the last twenty years in Ethiopia having with the objective of delivering financial service to rural and urban poor in order to contribute their part with respect to the country's poverty reduction goal.

However, different studies in various countries related to microfinance institution reveals that institutional outreach seems not encouraging despite the fact that international and national development programs have been giving high priority on outreach of microfinance to the poor for many years (Kimando, Kihoro and Njogu, 2012).

Despite the interest in the sector and the subsidies that have flowed into some of the mission-oriented MFIs, it appears challenging to make an MFI outreach to the poor. One survey found that 30 percent of domestic microfinance programs operating in 2001 were either have no breadth to reach out the active borrower through the country or were no depth in lending capital with minimal average loan balance (Bhatt, Painter and Tang 2002). Furthermore, most microfinance programs report difficulty in reaching out its service to the poor without continued reliance on loan balance, external fundraising, or other subsidies.

Moreover, different studies have also been conducted to determine factors affecting the financial outreach of MFIs using large and well-developed MFIs in various countries. The level of significance of these factors in affecting the outreach of MFIs, however, varies with studies. For instance, a study conducted by Cull et al., (2007) and Christen et al. (1995) showed that some of the determinants are found to be significant in one economy or applicable to a set of MFIs such as, Portfolio at risk (PAR), Gross loan portfolio (GLP and also some are not significant such as Operating expense to assets ratio (OEA), Return on assets (ROA).

In Ethiopia although some research such as (Kerta, 2007; Tiruneh, 2009 and Leteneh, 2009) have been conducted on the outreach of microfinance institutions related to impact and outreach, the effort made to build knowledge of the determinants of outreach of microfinance institutions using depth as predictor variables were little study carried out. Therefore, this study aimed to investigate the determinants of microfinance outreach with due emphasis on

depth and thereby will help to provide a good literature in the area and provide direction for future research.

1.3 Objectives of the Study

1.3.1 General objectives

This study in general investigated the performance of the MFIs; will assess the factor that affects outreach of the MFIs.

1.3.2 Specific objective

- To examine the effect of portfolio at risk on MFIs outreach.
- To examine the effect of operating expense ratio on MFIs outreach.
- To *examine* the effect of size on MFIs outreach.
- To examine the effect of age of MFI on outreach.
- To examine the effect of Return on equity ratio on MFIs outreach.

1.4 Research hypothesis

H1: There is a significant negative relationship between return on equity ratio of microfinance Institutions and outreach.

H2: There is a positive significant relationship between ages of microfinance institution to MFIs outreach.

H3: There is a significant negative relationship between the sizes of microfinance institution and MFIs outreach.

H4: There is a significant positive relationship between operating expense to asset ratio and MFIs outreach.

H5: There is a significant negative relationship between portfolio at risk and MFIs outreach.

1.5. Significance of the study

This researcher intended to examine the determinant factors that affect outreach of microfinance institutions in Ethiopia. Therefore, one of the most important things that MFIs obtain from the result of this particular study is to clearly understand the factors affecting outreach, since the research have some benefit for the following stakeholders;

- Manager of MFI; if there is a clearer understanding by MFI in the factors that affects their outreach; they gives greater attentions to these factors and strive to manage them properly in order to make themselves sufficient.

- Microfinance practitioners; measuring the major factors of MFI's outreach and consequently to give some insights into how a MFIs could be improved by showing gap.
- Policy makers; the study helps policy makers to issue a microfinance policy supervisory and regulatory framework that allows for the establishment of MFI that will cater for the need of small-scale business and low-income group.
- Finally, the research work can serve as starting point for further research on the same topic to the researcher.

1.6. Scope of the study

The scope of this study was limited to the assessment of the determinant of outreach of microfinance institution in Ethiopia using Average loan balance (depth) as a predictor measure and major indicator for outreach of micro finances institutions. The study made use of secondary annual panel data collected from microfinance institutions in Ethiopia over a period of 9 years from 2010 to 2018. The proposed study mainly used quantitative methods for analysis.

1.7. Limitation of the study

As all research work has its own challenge, this particular project also encountered with different limitations. Firstly, the research was being entirely dependent on secondary information, Secondly, although it has been assumed to study all MFIs, of the 32 licensed MFIs in Ethiopia, only 26 have providing data on the Association of Ethiopian MFIs annual report and further more as the study also need long range data, only 12 MFIs has a complete data (2010-2018) on the Mix market for the considered study years .finally, the study considers only clarifying the outreach of microfinance institutions determinants considering the ALS as a prominent indicators.

1.8 Organization of the study

This proposal has five chapters, the first chapter outline introduction of the study which includes the Background, Statement of the problem, Objectives, Research hypothesis, Significance of study, Scope of the study, and Organization of the Proposal, Second Chapter is a Literature review includes, Empirical review and Theoretical review, third chapter address the Research methodology and the choice of the appropriate research method for the study Research design, Research methodology, Data and method of data collection, Target

population, Sampling size and technique presentation and analysis techniques, Model specification and finally, Description of study variables and their expected sign.

CHAPTER TWO

RELATED LITERATURE REVIEW

Introduction

Since the inception of civilization, poverty has been an issue for humanity and battle for the survival of human exists. Among several other factors leading to poverty, limited availability of credit facilities to the poor people is also one of the major reasons for poverty (Tehulu, 2013). Poor people of the society lack access to any credit facility as they were unable to offer collaterals and securities against credits. Formal financial institutions provide facilities only for new companies and business, to begin and expand their operations, who offer collaterals and securities against credit. Poor people of the society also need various monetary services, including loan facilities, savings, insurance, and funds transfer (CGAP, 2004).

Microfinance institutions became the solution to poverty problem by providing credit facilities to poor people for starting a small business (Tehulu, 2013). These financial institutions were not restricted to provide loans/credit facilities only, but include other services such as insurance, education, health, social awareness and savings/deposits. Thus Microfinance, by empowering poor, was a concept of poverty reduction (Manos &Yaron, 2009).

2.1 Theoretical review

2.1.1 The Microfinance Models

Various types of lending and credit mechanisms are employed by different micro finance institutions. The following describes the most common lending approach and microcredit models in order to give an overview of how the actual money lending is accomplished

a. Solidarity group

The solidarity group model is also called peer lending group and normally consists of four to five individuals who group together to borrow a loan in solidarity. The members are self-selected, based on their reputation and relationship to each other. Useful here is the self-screening and group pressures imposed upon every member of the group, urging each and

every one of the borrowers to contribute his part in solidarity as mutually agreed and so ensures a rather secure loan recovery for the MFI (Guntz,2011).

b. Village banking

Village banks are community-managed credit and savings associations established by NGOs to provide access to financial services, build community self-help groups and help members accumulate savings. They usually have 25 to 50 members who are low-income individuals seeking to improve their lives through self-employment activities

After receiving the loan, a self-appointed village committee decides who gets smaller loans out of the group. This model further enables saving deposits. The normal payback periods range from 4 to 12 months and only after completion a new loan can be taken for the community. The role of the MFI is to assist only in administration and technical issues (Hazeltine and Bull, 2003, 104).

c. Grameen model

The Grameen model was invented in 1976 by Professor Muhammad Yunus, the founder and managing director of Grameen Bank. The model proved to be successful and today is practiced in more than 250 outlets of Grameen Bank in more than 100 countries (Yunus, 1999). The Grameen model was copied and modified many times according to the respective needs of regional markets and clients. Therefore, many other models are extensions of, or derived from, the Grameen Model

Basically, a new branch of the MFI is set up in a village with a field officer and some qualified workers, who have already done research on the population there in advance and made their choice according to its potential demand and its need of financial support. These employees of the MFI support then up to 15 to 20 villages in the surrounding and are strive to make the local, poor people aware of the microfinance possibilities through word of mouth and personal advisory. The lending process is similar to the solidarity group approach. Groups of five are created. However, in the beginning only two members of the group receive a loan and are monitored for one month. The credibility of the group will then be based on the repayment performance of the first two individuals (Hazeltine and Bull, 2003, 105).

d. Individual lending

Individual lending is usually more focused on the self-employed rather than the very poor and is similar to loans granted by traditional commercial banks without the sharing liability aspect. Moreover, the successful repayment of the first individual loan leads to a second and bigger loan after some trust and repayment capability has been established.

2.1.2 Performance Measure of Microfinance

In early time during their emergence, MFIs were financed by donor funds that focus on the objective of poverty eradication. Therefore, the performance of MFIs was measured on the outreach on how much MFI reached to the poor and the impact of those poor lives changed as a result of the financial service delivered. Since MFIs are facing double challenge of providing financial service to the poor (outreach) and cover their cost sustainably to operate their services; the assessment of microfinance performance must take in to account both dimensions. However, is not always easy to measure the social aspect of the microfinance (Balkenhol, 2007, p. 153).

Outreach to the poor

Outreach at a glance means the number of clients served. But, Meyer (2002) noted that outreach is multidimensional concept. In order to measure outreach, we need to look in to different dimensions:

The number of persons now served, which previously were denied access to formal financial services. Usually these persons will be the poor because they cannot provide the collateral required for accessing formal loans, are perceived as being too risky to serve, and impose high transaction costs on financial institutions because of the small size of their financial activities and transactions.

The number of women served

women often face greater problems than men in accessing financial services so number of women served is often measured as another criterion. Although difficult to measure, depth of poverty is a concern because the poorest of the poor face the greatest access problem. Some measure of depth of outreach is needed to evaluate how well MFIs reach the very poor.

Finally, the variety of financial services provided is the criterion because it has been shown that the poor demand and their welfare will be improved if efficient and secure savings,

insurance, remittance transfer and other services are provided in addition to the loans that are the predominant concern of policy makers.

Navajas et al. (2000), similarly, indicated that there are six aspects of measuring outreach. They are depth, worth of users, cost to users, breadth, length and scope. The depth of outreach refers to "the value the society attaches to the net gain from the use of the micro credit by a given borrower," (Navajas et al. 2000:335). This measure is to identify the poor clients. Because, the poor are the one who fail to get access to get credit from formal financial institutions since they fail to signal that they can repay their loan (Conning, 1997). And, worth of outreach to users refers to "how much a borrower is willing to pay for a loan,"(Navajas et al. 2000:335). Similarly, cost of outreach to user refers to "cost of a loan to a borrower," (Navajas et al. 2000:335). These costs to users might consists of prices like interest rates and various payments that they have to pay, which could be revenue to the lender, and other loan related transaction costs like expenses on documents, transport, food, taxes, etc. (Navajas et al. 2000:336). Finally, "breadth of outreach is the number of users...length of outreach is the time frame in which a microfinance organization produces loans," and "Scope of outreach is the number of types of financial contracts offered by a microfinance organization," (Navajas et al. 2000:336).

Financial Sustainability

The other indicator of performance of a micro finance institution is its financial sustainability. Different literatures noted that financial sustainability is one of the areas that we need to look at to assess the performance of micro finance institutions. Meyer (2002) noted that the poor needed to have access to financial service on long-term basis rather than just a onetime financial support. Short-term loan would worsen the welfare of the poor (Navajas et al., 2000). Meyer (2002) also stated that the financial unsustainability in the MFI arises due to low repayment rate or un-materialization of funds promised by donors or governments. According to Meyer (2002), there are two kind of sustainability that we could observe in assessing MFIs performance: i) Operational self-sustainability and ii) Financial self-sustainability. Operational self-sustainability is when the operating income is sufficient enough to cover operational costs like salaries, supplies, loan losses, and other administrative costs. And financial self-sustainability (which he referred as high standard measure) is when MFIs can also cover the costs of funds and other forms of subsidies received when they are valued at market prices. Meyer (2002:4) indicated, "Measuring financial sustainability

requires that MFIs maintain good financial accounts and follow recognized accounting practices that provide full transparency for income, expenses, loan recovery, and potential losses. Regarding indicator of financial sustainability, Khandker et. al. (1995) pointed out that loan repayment (measured by default rate) could be another indicator for financial sustainability of MFIs; because, low default rate would help to realize future lending.

Financial sustainability of MFI is calculated using different ratios. The most common financial ratios and indicators used to calculate are categorized by different organizations and are further elaborated. According to the Technical Guide of Performance Indicators for Microfinance Institutions (2003) there are four main categories of performance indicators: portfolio quality, efficiency and productivity, financial management and profitability (Micro Rate & Inter-American Development Bank, 2003).

According to Ledgerwood (1999), Performance of microfinance is measured in many parameters. This includes:

Portfolio quality indicator

Portfolio quality for MFIs are often measured by Portfolio at Risk (PaR), which measures the portion of the loan portfolio “contaminated” by arrears as a percentage of the total portfolio. A loan is considered to be at risk if the payment on it is more than 30 days late. In addition to Portfolio at Risk, we can also use Write-Offs, Provision Expenses and Risk Coverage as portfolio quality indicators (Micro Rate & Inter-American Development Bank, 2003).

Efficiency and Productivity ratio

To measure efficiency and productivity we can use Operating Expenses, Cost per Borrower, Personnel Productivity and Loan Officer Productivity as indicators (Micro Rate & Inter-American Development Bank, 2003). The performance of an MFI can also be measured by the number of borrowers per staff. This is a ratio of borrowers to staff indicating staff productivity. All things being equal the larger the number of borrowers a staff serves the higher will be his or her productivity (CGAP, 2003). The efficiency refers to the ability to produce maximum output at a given level of input, and it is the most effective way of delivering small loans to the very poor in microfinance context (Woller, 2000).

Financial viability indicator

Financial viability refers to the ability of the MFI to cover its costs with earned revenue. A financially viable MFI will not rely on donor funding to subsidize its operation. Common indicators here include financial spread, Operational Self Sustainability (OSS), Financial Self Sustainability (FSS) and Subsidy dependence index. To measure the financial management of a MFI we can use Funding Expense, Cost of Funds and the Debt/Equity ratio as indicators (Micro Rate and Inter-American Development Bank, 2003).

Profitability indicator

These indicators measure the MFI net income in relation to the structure of its balance sheet. Common measures include Return on Equity, Return on Assets, and Return on Business. Tend to summarize performance in all areas of the company and its sustainability. Most widely indicators of Sustainability and Profitability includes: Adjusted return on equity, adjusted return on assets, Operational self-sufficiency and financial self-sufficiency

Leverage and capital adequacy ratio

Leverage refers to the extent to which an MFI borrows money relative to its amount of equity. In other words, it answers the question of how many additional dollars can be mobilized from commercial sources for every dollar worth of funds owned by the MFI. The most widely used measure of leverage is the debt equity ratio. Capital adequacy refers to the amount of capital an MFI have relative to its assets. Capital adequacy means there is a sufficient level of capital required to absorb potential losses while providing financial sustainability. The measure used for capital adequacy is the ratio of capital to risk weighted assets

Outreach performance

MFIs can play an important role in developing countries by providing credit to poor people who do not have access to formal credit which usually requires collateral. Access to credit is welfare enhancing, and allocation of credit to the poor is an integral function of MFIs, therefore, outreach is an important measure of success (Quayes, 2015) Outreach is measured by the depth and breadth of essential services of microfinance institutions such as credit provision, savings mobilization, micro insurance, money transfer, and payment services (Rao, 2014). It measures how well an MFI has reached its target clients and fulfill the financial services demand of the clients (Yaron, 1994). Yaron (1994) and Okumu (2007) describe outreach as MFI efforts to provide service to poor people of the society formally unserved by

other financial institutions. They further describe that outreach is categorized as breadth and depth, where the breadth of outreach represents the number of poor clients reached. The depth of outreach represents the socioeconomic impact which MFI services have on the target customers. Furthermore, Rhyne (1998) also defines outreach as a measure of its depth and breadth.

2.1.3 Depth and breadth of Outreach

The depth of outreach (DO) may be defined as the “poverty level of clients served by MFI” (Rao, 2014; Rauf & Mahmood, 2009). The DO narrates the line of poverty, or the extent poor does not have access to regulated financial institutions. The proxy for DO is the average size of loan because other indicators of DO are usually expensive to collect. In recently published studies, DO was measured by average loan balance/size per borrower (Bhanot et al., 2015; Nanayakkara, 2012; Okumu, 2007). The breadth of outreach refers to “the scale of operations of an MFI” (Rao, 2014). Several studies have used number of active borrowers as a measure of the breadth of outreach (Kinde, 2012; Rai & Rai, 2012; Rauf & Mahmood, 2009). Results of Louis and Baesens (2013) shows that BO are positively related whereas the DO has a weaker impact on MFI profitability. Similarly, Rai and Rai (2012) also found that breadth influence operational self-sufficiency of MFI. The concept of depth and breadth is widely used in microfinance literature as a measure of MFI regarding outreach (Kar, 2013; Quayes, 2015; Vanroose&D’Espallier, 2013). Schreiner (2001) proposes a six-dimension approach for measuring the outreach. These dimensions were: 1) the outreach depth is measured as average loan size; 2) worth to users regarding dropout rate; 3) the cost to users regarding interest rate charged; 4) the length of outreach regarding financial performance, 6) width regarding number and percentage change of clients served, and 7) the scope of outreach regarding insurance, savings, and types of loans.

2.1.4 Determinants of MFIs outreach

The following section will discuss on the research result on the variables on the determinants of the outreach of MFIs. Different studies by different authors, specifically on the determinants of outreach, found different results on the determinants that affect the depth and breadth of microfinance institutions. This literature is reviewed for the purpose of developing empirical evidence for the independent variable that the researcher think may affect the proxy indicators of outreach stated in the previous section of microfinance institutions in Ethiopia.

2.1.5 Yield (Yield on Gross loan Portfolio)

The yield on gross loan portfolio (yield) indicates the efficiency of microfinance institutions in generating cash revenue from their outstanding portfolio. It measures all interest and fees charged on loans outstanding over a period (the measure of average interest rates on loans to customers). Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007) In order to remain sustainable, Nadiya (2011) suggested MFI managers shall set the interest rates of the MFIs, such that it covers its total cost; comprising of cost of funds, transaction cost and default costs. Therefore, the sustainability of microfinance depends on how much interest income they earn from their operation Gonzalez, (2007). The research finding by Cull (2005) indicates that the coefficient for real gross portfolio yield (the measure of average interest rates on loans to customers) is positive and significant across two outreach indicators (depth and breadth). Indicating that individual-based lenders tend to be more profitable when their average interest rates are higher. However, the same result indicates that the result does not hold true for village banks or solidarity group lenders. The yield coefficients for both types of lenders are insignificant (except for village banks in the ROA specifications) and negative. When summed, the coefficients for yield and the village bank yield interaction are not significantly different from zero. Thus, for village banks there is not a significant relationship between yields and outreach. The same pattern also holds for solidarity group lenders while the evidence indicates a strong positive association between interest rates outreach only for individual-based lenders.

2.1.6 MFIs Capital Structure /Debt to Equity Ratio

The various sources of capital and its combination could affect depth and, therefore, outreach of microfinance institutions. According to Woller and Schreiner (2002), these different sources of capital include savings, deposits, loans and shares. Various studies have been conducted to explain whether the capital structure determines the outreach of microfinance institutions. For instance, Kyereboah (2007) found that highly leveraged microfinance institutions have higher ability to deal with moral hazards and adverse selection than their counterparts with lower leverage ratios. This states that high leverage and profitability are positively correlated. Bogan et al (2007) conducted a study to ascertain whether capital structure affects the outreach of MFI. They found that microfinance institutions' capital structure was associated with their financial sustainability. Ganka (2010) states that although how the capital has been structured affects outreach, having different sources of capital do

not improve financial sustainability and outreach. Ganka also identified that equity is a relatively cheaper source of financing and, therefore, improves financial sustainability and outreach.

2.1.7 Age of an MFI

The age of the firm might also have an impact on the firm's performance. According to (CGAP, 2009) age have three important effects on MFIs; higher number of loans may drive scale economics, higher average loan sizes may improve the cost structure and more knowledge about customers may streamline processes. The age refers to the period that an MFI has been in operation since its initial inception. Vast studies have been done to explain whether age of MFIs determines outreach of the microfinance institutions. For example, Lumpkin, et al, (2001), indicated that older firms to be more experienced and can therefore enjoy higher performance. Moreover, Bogan et al (2007) and Cull et al (2007) also found that the age of a microfinance institution is related to its financial sustainability. Cull et al (2005) strengthen the same idea by indicating that an institution's age significantly and positively linked to MFIs outreach.

2.1.8 Size of MFIs

Due to economies of scale the size of a firm is considered to be an important determinant of a firm's performance. The size of an MFI is measured by the value of its assets (Mersland and storm, 2009; Hermes et al, 2008; Bogan et al, 2007; Hartarska, 2005). According to Lislevand (2012), the size of MFI has significant positive effect on the performance measured by the return on asset. Similarly, Cull et al (2007) also indicates a positive relation between the size of MFI and financial performance. While Hartarska (2005) found that the size of an MFI did not significantly affect its outreach, recent studies by Mersland and storm (2009) and Bogan et al (2007) have reported that the size of an MFI is associated with its outreach. Rombrugghe et al (2007) confirm this by adding beyond the size of the loans, the size of the MFI itself may matter the size of the MFIs can be measured by the total value of the portfolio or its average value over a year, or by the number of borrowers or of members. Economies of scale can occur through the size of the portfolio or through the number of active customers or both. If they occur mainly at the portfolio level, this will be captured by the size of the loans.

2.1.9 Portfolio at Risk

The portfolio at risk (PAR) measures indicates how an MFI is efficient in making collections. The higher the PAR indicates low repayment rates, as indication of inefficient

24 microfinance institution. The higher the PAR, the more inefficient the microfinance will be and, therefore, the less financially sustainable. As per the econometric result by Nyamsogoro (2010) indicates, there is a negative relationship between PAR and financial sustainability of microfinance institutions. This shows that the less efficient the microfinance institution is (higher PAR) the less will be its financial sustainability. Therefore, the statistics for the variables indicates that there is insignificant relationship between the two variables.

2.1.10 Operating Expense Ratio

Efficiency in expenses management should ensure a more effective use of MFIs loan able resources, which may enhance profitability. Higher ratios of operating expenses to gross loan portfolio imply a less efficient management. Empirical evidence points to the fact that providing microfinance is a costly business perhaps due to high transaction and information costs (Hermes and Lensink, 2007; Gonzalez, 2007).

According to the finding of Nyamsogorom (2010) the operating expenses ratio strongly affects outreach of microfinance institutions Dissanayake (2012) on his research of the determinants of operational self-sufficiency of microfinance institutions stated that there is strong significant negative correlation in Operating Expense Ratio to Operational Self Sufficiency Ratio. This indicates that, change in Operating Expense Ratio, is negatively contributing towards outreach significantly

2.2 Empirical review on the outreach of MFIs in Ethiopia

Although the MFIs operation in Ethiopia accounts several years a few researches has been conducted in the area of sustainability of microfinance institution. Even those researches conducted in the area are not adequately measure the performance of the microfinance institution in Ethiopia since they are weak in terms of statistical measure. To supplement this particular research, the results of some of these researches conducted in such area are presented below.

According to a research conducted by Alemayehu (2008) on the performance of Ethiopian MFI, the average operational self-sufficiency for small MFI is 99.5% whereas average financial self-sufficiency still below the threshold level (81%). The average Operational self-sufficiency and financial self-sufficiency for medium MFIs is 149% and 125% respectively. large microfinance institutions scored 206 % in operational and 129.5% in financial self-sufficiency. In general, the study concluded that small MFIs were not in a position to generate sufficient revenue to cover operating costs and at the same time their ability to operate and

expand without of operational and financial self-sufficiency because in both ratios they achieved beyond the threshold level (100%).

The study by Kidane (2007) on one of the largest MFIs in Ethiopia Amhara Credit and Saving Institution (ACSI) shows that ACSI has served more than half a million clients. Over 1.6 million loans have been disbursed worth Birr 1.5 billion. By 2005, the institution was operationally and financially self-sufficient at 119.9% and 115.3% respectively. ACSI is among a few MFIs that is able to achieve the highest efficiency at the lowest cost per borrower. The operating cost was as low as five cents in 2005. ACSI also has a high portfolio quality, as delinquency rates are around 1.9%.

Letenah (2009) examines the performance of sampled microfinance institution in Ethiopia and conclude that all the MFIs are good at breath of outreach, cost management, efficiency and productivity. He also noted in his findings that MFIs charge low interest rates and the profitability and sustainability of the MFIs depend on their size. Moreover, he noted that MFIs in Ethiopia are not reaching the poorest of the poor. They are also poor in terms of the ratio of GLP to assets, allocating a lower proportion of their total assets in to loans. They are also not using their debt capacity properly. The large and small MFIs are allocating more loan loss provision expense than the industry average and the related PAR is high for these MFIs. From a simple correlation analysis it is found that there is a trade-off between serving the poor and being operationally self-sufficient. MFIs age correlates positively with efficiency, productivity, the use debt financing and OSS. It is also found that the use of debt financing makes firms more efficient and productive.

According to research conducted by Bayeh (2012) on financial sustainability of microfinance in Ethiopia he found that the mean of FSS is 118.4 % indicating financially sustainable. Out of the total 144 observations 90(62.5) indicated sustainable MFIs and the rest 54 observations (37.5%) of the MFIs were not financially sustainable.

The study also examined that that microfinance breadth of outreach, depth of outreach, dependency ratio and cost per borrower affect the financial sustainability of microfinance institutions in Ethiopia. However, the microfinance capital structure and staff productivity have insignificant impact on financial sustainability of MFIs in Ethiopia for the study periods (2002-2010).

Tiruneh(2009) in his study of the relation between outreach and financial sustainability in Ethiopia found that in terms of average OSS the MFIs shows an encouraging result of reaching the bench mark100%. Although the average OSS of MFIs in the study showed above the benchmark, the increment in each year is not consistent and upward trend. The finding in FSS showed that the average FSS of the fifteen sampled study institutions were below the bench mark throughout the studied year indicating MFIs in Ethiopia are not financially self-sufficient.

According to Degefe (2009) on his part of study on the performance analysis of the selected microfinance taking a five years data (1999-2003) found out that of the nine studied microfinance institutions five had attended operational sustainability or operational self – sufficiency. However, with the more comprehensive indicator, financial self-sufficiency that was computed with the consideration of opportunity cost of capital, only two out of nine MFIs(ACSI and DECSI) were above 100% with OCSSCO exactly reached 100 in 2003. The rest of the MFIs were not able to reach the bench mark and financially sustainable. Furthermore, the study also assessed the degree of leverage through the subsidy dependency index indicator and found out that only one MFI, ACSI, reached the stage of being able to operate with equity capital and therefore freed from subsidy.

2.3 Conclusion and knowledge gap

As it is understood from the aforementioned studies in the area, almost all studies were focusing on the performance analysis in terms of Financial Self Sufficiency (FSS), Operational Self Sufficiency (OSS) and the relation of performance with outreach. To my access on the literature reviewed there has been little or no study carried on the assessment of the determinants of breadth (no of active borrower) and depth (average loan balance) of outreach and institutional level factors influence, this study, therefore, addresses two key questions: (1) Is there a trade-off between depth of outreach and breadth of outreach? (2) Which institutional level factors influence MFIs outreach in Ethiopia? Understanding these dimensions of outreach is important in tackling the challenge of financial inclusion which is being pursued across continents. This study makes the first step in this direction by providing empirical evidence that sheds new insights on outreach performance of MFIs in Ethiopia.

MFIs are usually faced with the challenge of reaching the poor while at the same expected to be financial sustainable (cheminingwa 2013). there for, the relationship between outreach of microfinance and financial sustainability may be trade off or a manner of compatibility.

2.4 conceptual frame work

The study adopts the outreach framework by sub dividing to the poor in to five variables of depth of outreach. (schreiner,2002; USAID,2006) according to schreiner, some of these outreach factors may be difficult to measure science they require data that may not available. Therefore, this study is limited to examine the influence of depth outreach

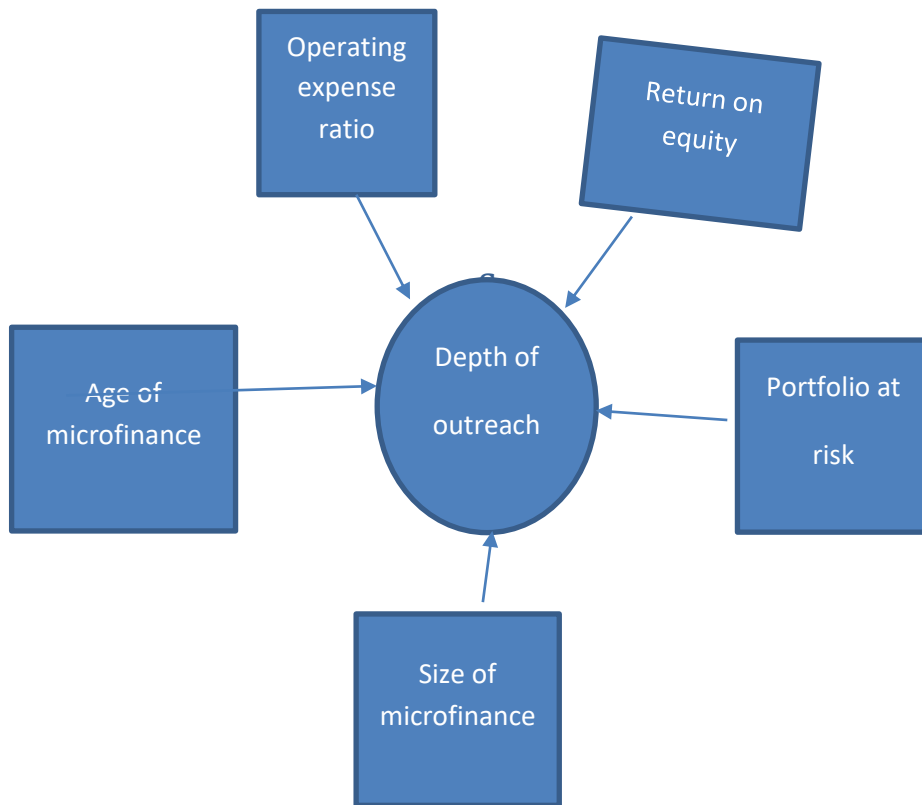


Figure 1. theoretical model on the relationship between outreach and depth of microfinance

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The purpose of this chapter is to present the underlying principles of research methodology and the choice of the appropriate research method for the study. The chapter is arranged as follows: Research design, Research methodology, Data and method of data collection, Target population, Sample size and technique presentation and analysis techniques, Model specification and finally, Description of study variables and their expected sign.

3.2 Research approach

As noted in Saunders et al. (2009), in an investigative study there are three familiar types of research approaches to business and social research namely, quantitative, qualitative and mixed methods approach. Though, each approach has its own strengths and limitations, Creswell (2003) advocates that certain types of social research problems call for specific approaches. Those approaches are discussed as follows:

Quantitative research: is grounded in the post-positivism knowledge claims at primarily reflects the scientific method of the natural sciences. This paradigm adopts a deductive approach to the research process. The researcher gathers data from the real world setting and then analyses the data statistically to support or reject the hypotheses Saunders et al. (2009).

Qualitative approach: is centred on the interpretive social sciences paradigm. Qualitative methodology of investigation tends to be based on recognition of the importance of the subjective, experiential “life-world” of human beings Saunders et al. (2009).

Mixed approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (e.g., consequence-oriented, problem-centered, and pluralistic). It employs strategies of inquiry that involve collecting data either simultaneously or sequentially to best understand research problem

This study will use quantitative research approach to examine a stated objective because quantitative research is a systematic and scientific investigation of quantitative properties and phenomena and their relationships Saunders et al. (2009)

3.3 Research Design

According to Saunders et al. (2009) there basically exist three different types of studies which aim to answer the research objective and questions in different ways. There are three different types of research design; these are exploratory, descriptive and explanatory. The main focus of an exploratory study is to examine problems in new ways and it is a very good method to increase the understanding of a specific topic. The most common data collection methods are interviews in order to get an in depth understanding of the subject being investigated. The second type of study is according to Saunders et al. (2009) a descriptive study and it is usually used as a forerunner to the two other types of studies. The main aim of the descriptive study is to get an accurate picture of the situation that is being studied.

The third type of study is explanatory which aims to examine the cause and effect relationships between dependent and independent variables in order to detect a certain pattern. As noted by Saunders et al. (2009), explanatory research design examines the cause and effect relationships between dependent and independent variable. Thus, this research is to establish the cause and effect relationships between dividend pay-out and its determinants; the explanatory approach is the most appropriate. Therefore, this research will use the explanatory type of studies to answer the objective of the study.

3.4 Target population

The target population for this particular study was all the MFIs currently operating in Ethiopia. According to NBE (2011) report currently there are 32 MFIs that are providing financial service to the poor society of the country. From the total 32 MFIs operating in the country 12 MFIs did not have the information for the required period in the Mix market website to calculate their depth. Based on this, the sampling frame is those MFIs (sfipi, gasha, vision, sidama, bus.gon, peace, meklit, eshet, wassa, omo, harbu, cons.b) that have audited financial statement from 2010 to 2018.

The consideration of number of variables under study was required to meet the ideal ratio. This study has one dependent variable namely depth (Average loan balance). The depth has 5 independent variables.

3.5 Research Method

The research was used multiple regression models to assess the significant determinant of the outreach of microfinance institutions' in Ethiopia. To measure the outreach of microfinance institutions in Ethiopia Average loan balance (depth of outreach) are applied as the dependent variables. Considering, Abdulahi,(2013) and Befkadu K.,(1995) and others studies

conducted in different areas, the measure of the predictor of depth will be extract and also applies in this study. Accordingly, to measure the predictor variable of outreach, six measures namely MFIs age, Yield on Gross portfolio, Portfolio at risk, Operating Expense ratio Size of MFIs and Debt to equity ratio are considered.

3.6 Data and Methods of data Collection

This study used anticipated to assess the determinant of microfinance depth. The study entirely bases its source from secondary data by means of their annual report of the respective MFIs under consideration. The data for this study is financial ration and outreach indicators. The data used for this study is purely secondary data taken from Association of Ethiopia Microfinance Institution (AEMFI) and the MIX Market Inc. web site over the period of 2005 to 2014. As most MFIs have no data before 2005 and did not submit the 2004 complete report, the research considered data of year from in this study 2005 to 2014.

The study makes use of panel data to explain the relation between dependent and explanatory variables under considerations. The use of these panel data model deemed to have advantages over cross section and time serious data methodology. Panel data or longitudinal data are data sets containing repeated observation of the same individual collected over a number of period (Johnson and Dinardo, 2007; Baum, 2006; Wooldridge, 2006). A panel data approach is more useful than either cross-section or time-series data alone. As Brook (2008) states the advantages of using the panel data set; first it can address a broader range of issues and tackle more complex problems. Besides, by combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test. It can also help to mitigate problems of multicollinearity among explanatory variables that may arise if time series are modeled individually.

3.7 Data analysis

To comply with the objective, the research is running based on panel data, primarily; the data required for the research was takes from the Mix Market Website and Association of Ethiopia Micro Financial Institutions (AEMFI) reports. These are ratio values for various variables including the dependent and independent once. First, this study collected the needed data from the sources mentioned earlier. After the collected data had been kept in excel sheet then the data were organized for analysis. Since the data needed ratio, some variables were not a ratio value; so, transformation of data had been made.

3.8 Model specification

Variables

The study used one measures of outreach performance as dependent variable. The first measure is depth approximated by average loan balance per borrower (ALS). Increase in ALS represents a low poverty outreach, which represents negative outreach performance. Additionally, second dependent variable is breadth of outreach, measured by number of active

borrowers. An increase in number of active borrowers indicates a positive outreach performance. Additionally, the independent variables in this study are mentioned

Dependent variable

Depth of outreach ALPB = gross loan portfolio / number of active borrowers

Independent variable

- MFIs age (AGE)
- Portfolio at risk (PAR)
- Operating Expense ratio (OER)
- Size of MFIs and
- Return on equity (ROE)

In the empirical estimation, the study will investigate depth of outreach of outreach using ALB (average loan balance) as dependent measures. Equation [1] is the empirical model for depth of outreach and ALB is used as the dependent measure. The independent variables of choice are based on the widely used measures for microfinance outreach efforts as documented in the literature. The empirical models estimated are presented as follows:
 $ALB_{it} = \alpha_i + \beta_1 PAR_{it} + \beta_2 ROE_{it} + \beta_3 TA_{it} + \beta_4 OEA_{it} + \beta_5 AGE_{it} + \epsilon_{it} \dots$ Equation[1]

α_i is the constant term showing the value of FSS, when all the coefficient of the independent variables is zero,

AGE Grants for age of a MFI i at time t,

OER it is the operating expense ratio of a MFI I at time t,

PAR it is portfolio at risk of a MFI i at time t,

ROE it is the return on equity by a MFI i at time t,

SIZE it is the size of a MFI i at time t, and

ε_{it} is the error term of an MFI i at time t.

CHAPTER FOUR

RESULTS AND DISCUSSION

INTRODUCTION

In the preceding chapters, the review of relevant literature helped this study to understand the problem and design an appropriate research approach to deal with. The previous chapter also discussed the research design employed to achieve the objectives of the study and to test the research hypotheses there on. In this chapter, the study analyses the collected data using various statistical tools and presents the results and discussion accordingly. This chapter presents the findings of the study. The findings are presented in two sections. In the first section the descriptive statistics of both dependent and independent variables is presented. In the second section the econometrics result in which the explanatory variables are examined to see whether the explanatory variables determine the outreach of the MFIs.

4.1 RESULTS

In order to achieve the study objective, the researcher adopted various statistical tools to analyse the collected data. Section 4.1.1 presents the descriptive statistics which focuses on the distribution the data, mean, maximum and standard deviation. Section 4.1.2 presents tests for the classical linear regression model assumptions followed by the correlation analysis among the dependent and independent variables in section 4.1.3. The model selection test and outcomes of the regression result with discussion are presented in section 4.1.4 and 4.1.5 respectively.

4.1.1 Descriptive statistics

This section essentially present descriptive statistics of dependent and explanatory variables included in this study. The dependent variable of this study are depth of MFI's and explanatory variable are size of MFI's, return on equity, age of MFI's, Operating expense ratio, Portfolio at risk >90 days. The total observation for each dependent and independent variable were 108 (data for 12 Micro finance institutions for the period from the year 2010 to 2018). The descriptive statistics include mean, median, maximum, minimum and standard deviation of all study variable (see table 4.1)

4.1: summary of Descriptive statistics

	ALPB	AGE	OER	PAR	ROE	SIZE
Mean	1.372956	44.30556	0.194739	0.328618	0.343151	8.863835
Median	1.238500	51.50000	0.181031	0.290336	0.304705	5.539866
Maximum	3.971000	98.00000	0.460478	0.984115	0.997755	16.76304
Minimum	0.105000	5.000000	0.080217	0.023281	0.012057	4.258956
Std. Dev.	1.132113	24.54234	0.059206	0.207577	0.231707	4.960461
Observations	108	108	108	108	108	108

As shown in table 4.1 above, the dependent variable of this study has a mean value of 1.372956 and standard deviation of 1.132113. This implies that during the study period the sampled Microfinance institution have normal accruals, on average, with log value of 1.372956. On the other hand, the minimum and maximum value of 0.105000 and 3.971000 for depth of outreach indicate that from the sampled Microfinance Institutional Microfinance institution with log value of 3.971000 have maximum number of active borrower while a Microfinance institution with log value of 0.105000 have a minimum number of active borrowers. The entire figure shows that the Ethiopian Microfinance institution have averagely positive log 1.372956 of normal accrual, that implicate number of active borrower and also have averagely positive log 2.038 of normal accrual, that implicate average loan balance.

The first explanatory variable of the study, age of microfinance, as demonstrated in table 4.1 has a minimum value and maximum value of 5 and 98 respectively. These imply that there is an out of the selected Microfinance institution with the maximum age of 98 and a Microfinance institution with as minimum age of 5 during the review period. Yet, age of microfinance has standard deviation from its mean value with 24.54234. The average age is reported to be 51.5 years during the review period. According to this the Microfinance institutions have 51.5 years from their foundation up to now.

Profitability measure, return on equity shows, how much return the company have generated from the equity employed. In this case, return on equity has a mean value of 34.3 percent and standard deviation of 23.1 present. Thus, the management of the Microfinance institution have generated on average 34.3% return for each equity employed and the deviation from the mean value was 23.3%. Besides, the minimum and maximum amount of return on equity of

the sampled Microfinance institution is 1.2 percent and 99.7 percent respectively. This indicates that there is a Microfinance institution with a maximum return on equity ratio of 99.7 percent and a company with a minimum return on equity ratio of 1.2 percent.

Portfolio at risk > 90 days is another indicator of MFI's outreach in this study. As reported in table 4.1 its mean value and standard deviation is 32.5% and 20% respectively. The maximum and minimum value for PAR ratio is 98% and 2% respectively. This implies that the Microfinance institutions have average of 98% loan or portfolio that are undue over 90 days.

As shown in table 4.1 above, the independent variable, sizes have a mean value of 8.863835 and standard deviation of 4.960461. This implies that during the study period the sampled Microfinance institutions have total asset, on average, with log value of 8.863835. On the other hand, the minimum and maximum value of 4.258956 and 16.76304 indicate that from the sampled Microfinance institutions a Microfinance institution with 16.76304 have the highest total asset while a Microfinance institution with 4.258956 have a minimum log of total asset. The entire figure shows that the Ethiopian Microfinance institutions have averagely log 16.76304 total asset that implicate size of the Microfinance institutions.

Operating expense ratio is another indicator of outreach in this study. It is computed by dividing operating expense and gross loan portfolio. As reported in table 4.1 its mean value and standard deviation is 0.194739 and 0.059206 respectively. The maximum and minimum value for operating expense ratios 0.460478 and 0.080217 respectively. This implies that the Microfinance institution management use on average of 0.271 operating expenses to cover their gross loan portfolio.

4.1.2 Correlation Analysis

The purpose of correlation matrix in this particular study was to show the linear association between the dependent and independent variables. As noted in Brooks (2008), correlation between two variables measures the degree of linear association between them. Values of the correlation coefficient are always range between positive, one and negative one. A correlation coefficient of positive one indicates that a perfect positive association between the two variables; while a correlation coefficient of negative one indicates that a perfect negative association between the two variables. A correlation coefficient of zero, on the other hand, indicates that there is no linear relationship between the two variables.

As exhibited in table 4.2, almost all the variables correlated Average loan size(ALS) except firm AGE (age, 0.716914) are with the lowest correlation coefficient. This relationship suggests initial picture as to the nature of the relationship between explanatory variables and dependent variables of ALS. As the correlation matrix indicates, firm size is the most dominant determinant of outreach, which is reflected in the table by the very strong negative between size and the dependent variables (ALS) and also age and ALS. This correlation clearly shows that, as the firm size increases, ALS also moves to the same direction and as the age of the MFI's increases ALS moves the same.

Besides, the variables, OER show a weak correlation with ALS. Table 4.2 also reported the coefficient of correlation between SIZE and POE with the dependent variables shows that strong and negative relationship. The coefficient of correlation between PAR>90 with the dependent variables shows that weak and negative relationship.

Table 4.2: Correlation matrix of dependent and independent variables

	ALPB	AGE	OER	PAR	ROE	SIZE
ALPB	1.000000					
AGE	0.716914	1.000000				
OER	0.051294	-0.041008	1.000000			
PAR	-0.308581	-0.202305	0.264048	1.000000		
ROE	-0.200113	-0.245048	-0.076779	-0.069795	1.000000	
SIZE	-0.758424	-0.760148	0.082481	0.314842	0.144343	1.000000

Source: Output of Eviews 8

4.1.3 CLRM Assumptions and Diagnostic tests

Diagnostic test is made to make sure that the classical linear regression model assumption is violated or not. In this study an attempt is made to test Heteroscedasticity, Multicollinearity,

4.1.3.1 Autocorrelation and normality the result of which are presented and discussed as follows.

Heteroscedasticity

It has been assumed that the variance of the errors is constant, σ^2 ; this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be Heteroscedasticity. Consequence of proceeding with the existence of Heteroscedasticity is that, the OLS estimators will still give unbiased (and also consistent) coefficient estimates, but they are no longer blue that is, they no longer have the minimum variance.

HO=There is no heteroscedasticity (the error terms are homoscedastic).

H1=There is Heteroscedasticity

Therefore, for the assumption to hold and to get efficient estimator, this test has been made for both ALS models using the White test for Heteroscedasticity and their results are indicated under the table 4.3. It is hypothesized that there is no Heteroscedasticity in which the null and alternative hypothesis are summarized here under for both models. The most popular method, a white's test has to be made, to ensure that this assumption is no longer violated. Brooks (2008) recommended that not to reject the null hypothesis, the p-value of the F- and χ^2 ('LM') versions of the test statistic and the pvalue of the Scaled Explained SS must be higher than 0.05.

Table 4.3: Results of Heteroskedasticity test for MFIs' ALS models

	MODEL ALS
F-statistic	1.572770
Obs*R-squared	28.67901
Scaled explained SS	32.94144
Prob. F(20,87)	0.0783
Prob. Chi-Square(20)	0.0943
Prob. Chi-Square(20)	0.0342

Source: Output of Eviews 8

Eviews output in table 4.3 presents three different types of tests for Heteroskedasticity indicating that both the F- and χ^2 ('LM') versions of the test statistic give the same conclusion that there is no evidence for the presence of Heteroskedasticity, since the pvalues are higher than 0.05. The third version of the test statistic, 'Scaled explained SS', as the name suggests is based on a normalized version of the explained sum of squares, suggested also that there is no evidence of Heteroskedasticityfor both models as the p values are considerably higher than 0.05. Therefore, there is no evidence to reject the null hypothesis.

4.1.3-2 Test of Autocorrelation (Serial Correlation)

The other Assumption of classical linear regression model is Autocorrelation. The diagnostic test for CLRM assumption of no autocorrelation was tested by this study. According to Gujarati, (2004) the assumption of no autocorrelation between the disturbances assumes that given any two X values, X_i and X_j ($i \neq j$), the correlation between any two u_i and u_j ($i \neq j$), is zero. According to Chris Brooks (2008) it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are ‘autocorrelated’ or that they are ‘serially correlated’. This assumption was tested by Durbin Watson (DW) test of autocorrelation. Durbin--Watson (DW) is a test for first order autocorrelation -- i.e. it tests for a relationship between an error and its immediate previous value. One way to motivate the test and to interpret the test statistic would be in the context of a regression of the time t error on its previous value

$$u_t = \rho u_{t-1} + v_t$$

Where $v_t \sim N(0, \sigma^2 v)$ and ρ is the coefficient of autocorrelation. The DW test statistic has as its null and alternative hypotheses. Under the null hypothesis, the errors at time $t - 1$ and t are independent of one another (the errors at time $t - 1$ and t are uncorrelated), and the alternative hypothesis says the errors at time $t - 1$ and t are independent (the errors at time $t - 1$ and t are serially correlated). Therefore

$$H_0: \rho = 0 \text{ (no autocorrelation)}$$

$$H_1: \rho \neq 0 \text{ (autocorrelation)}$$

DW has 2 critical values: an upper critical value (d_U) and a lower critical value (d_L), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected! The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 4.1

Figure 4.3 Rejection, non-rejection, and inconclusive regions for DW test

	Reject H_0 : positive autocorrelation	inconclusive	Do not reject H_0 : no evidence of autocorrelation	Inconclusive	Reject H_0 : negative autocorrelation	
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0	1.4831.672	2	2.3282.5174			

According to Brooks (2008) the following is the decision rule to reject and not to reject the null hypothesis

- null hypothesis is rejected and the existence of positive autocorrelation presumed if DW is less than the lower critical value dL;
- the null hypothesis is also rejected and the existence of negative autocorrelation presumed if DW is greater than 4 minus the lower critical value dL;
- The null hypothesis is not rejected and no significant residual autocorrelation is presumed if DW is between the upper critical value dU and 4 minus the upper critical value dU.
- The null hypothesis is neither rejected or fails to be rejected if DW is between lower critical value dL and the upper critical value dU or if DW is in between 4 minus the upper critical value dU and 4 minus the lower critical value DL.

This study has Five explanatory variables (k) with 108 observations and the dL and dU values are **1.483** and **1.672**, respectively. Accordingly, the value of 4-dU and 4-dL are **2.328** and **2.517**, respectively. The DW values of ALS for 108 observations in this study are **1.96071** and **1.68919** respectively. The DW value of ALS lies in the no evidence of autocorrelation region where the null hypothesis of no autocorrelation does not be rejected.

Table 4.4: Autocorrelation Test For test ALS models

Models	R-squared	Adjusted R-squared	DW
ALS	0.649552	0.632373	1.68919

4.1.3.3 Test for Normality

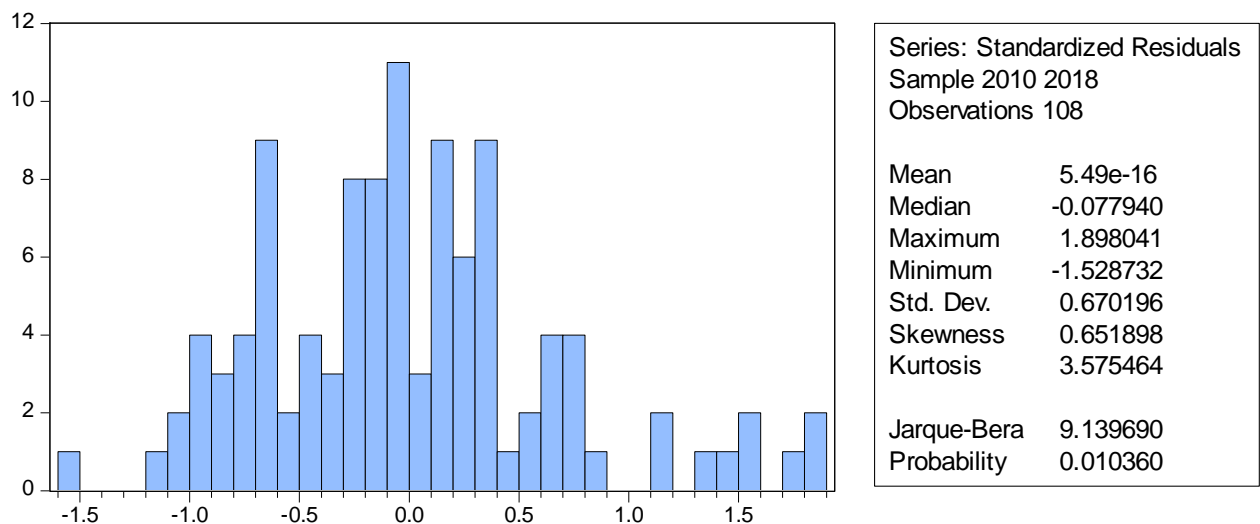
The assumption of normality requires the disturbance to be normally distributed around the mean. This test has been conducted using the Jarque-Bera test. The *p*-value of the normality test should be bigger than 0.05 and Kurtosis should be around 3 for not to reject the null hypothesis of normality at the 5% significance level (Brooks, 2008). The null and alternative

hypothesis for the test has been indicated here under.
H0: Normally distributed errors.

H1: non-normal distribution errors.

A normal distribution is not skewed and is defined to have a coefficient of kurtosis of 3 (Brooks, 2008). Accordingly, the coefficient of the kurtosis in this study is 3.5 for ALS model model which is almost the same with the suggested kurtosis coefficient of 3. Furthermore, the p-value for the Jarque-Bera (JB) test of ALS are 9.139690. This indicates that the p-value for the Jarque-Bera test for both models is greater than 0.05 which indicates that the errors are non-normally distributed. Based on the statistical result, we fail to reject the null hypothesis of being normality at the 5% significance level.

Figure 4.2 Normality test for Ethiopian MFIs’ ALS model



4.1.4 Model Selection Test: Random Verses Fixed Effect Model

In order, achieve the objective of the study the researcher-employed panel Data model. As far as the Data is concerned, comprising both time series and cross-sectional elements panel model is appropriate. In order, achieve the objective of the study the researcher-employed panel Data model. As far as the Data, comprising both time series and cross-sectional elements panel model is appropriate.

The choice of this methods is comparing time series and cross-sectional units and by using Haussmann specification test. As noted by Gujarati (2004) if T (the number of time series

data) is large and N (the number of cross-sectional units) is small, there is likely to be little difference in the values of the parameters estimated by fixed effect model and random effect model.

Hence, the choice here is based on computational convenience. On this score, random effect model may be preferable.

The best alternative to make a choice between fixed effects and random effects model is conducting Hausman specification test. In this study the Hausman specification tests is utilized to decide which model is appropriate to fit the sample data. Hausman specification test is the classical test of whether the fixed or random effects model should have used.

Running a Hausman specification test at five percent level enables the researcher to choose between fixed effects and random effects models (Hausman, 1978). The hypothesis for Hausman specification test is:

Null hypothesis: Random- effect model is more appropriate

Alternative hypothesis: Fixed-effect model is more appropriate

Decision rule: if the P-value from the Hausman test is statistically significant (less than five percent) the fixed-effect model is preferred in favor of random effect, otherwise the random effect model is selected.

The result from Hausman test in tables allow as to not reject the null hypothesis that random model is better in this regression analysis. This implies that a random effect model is more appropriate than fixed effect model to undertake the panel regression estimation for this study.

Table 4. 5 Correlated Random Effect-Hausman Test ALS models

Teste of summery cross-section	Model ALS
Chi-sq.statistic	9.139690
Chi-sq.d.f.	5
Prob	0.010360

4.1.5 Random Effect Regression result

This section presents a random effect model regression result to examine the impact of explanatory variables (AGE, OER, ROE, PAR>90 and SIZE) on the average loan size (ALS) of Microfinance institutions.

Table 4.6 Random effect model regression estimation result

	Model ALS	
Dependent variable	Coefficient	Prob.
C	1.503910	0.0009
Age of micro finance(AGE)	0.014795	0.0008
Portfolio at risk(PAR)	-0.724885	0.0409
Operating expense ratio(OER)	2.578967	0.0290
Return on equity(ROE)	-0.252454	0.3996
Size of microfinance(SIZE)	-0.108738	0.0000
R-squared	0.649552	
Adjusted R-squared	0.632373	
Prob.(F-statistic)	0.000000	
Durbin waston(dw)	37.81117	
Number of observation	108	

Source: Output of Eviews 8

Note: * significant at 5% and *** insignificant

The estimation result of the panel regression model used in this study is reported in table 4.9. Accordingly, the R-squared statistics and the Adjusted-R squared statistics of the model are 0.649552 and 0.632373 for ALS. These indicate that explanatory variables included in this model could explain variation in the dependent variables by about 64 and 63 percent for ALS. The remaining 36 and 27 percent can be taken as the role of explanatory variables that are not included in this model but that have impact on the Microfinance outreach.

The null hypothesis of F-statistic (the overall test of significance) that the R^2 is equal to zero is rejected at 1% as the p-value is sufficiently low. F-probability of 0.000 indicates that the

models fit the sample data well and the explanatory variables are jointly significant. All the independent variables jointly have statistically significant impact on average loan size of microfinance institution. As shown in the above table AGE, SIZE, PAR and OER on average loan size have statistical significance at 0.05 significance level. The remaining variables have insignificant impact on Microfinance outreach.

4.1.5.1 Portfolio at risk

Portfolio quality measured by PAR has negative significant impact on ALS. This implies that portfolio at risk does influence the outreach of MFIs this means the relationship between them is an inverse. Furthermore, the relationship between PAR and NAB is statistically positively significant. PAR has coefficient value of 1.158199 and is significant at 5 percent. Result suggests that as loan portfolio quality is highly related with the outreach of MFI. MFIs should be prudent in increase their customer portfolio as these portfolios are not backed by any security. Poor management of loans may be one of the reasons for the increase in bad loans.

4.1.5.2 Size of MFIs

Size of MFI is positively insignificant related to number of active borrowers. This implies that as MFIs size weather increase or decrease they tend to constant or no change on number of active borrowers. Size of MFI is negative significantly related to average loan balance per borrower. The coefficient value for size of MFI is -1.640225 and is statistically significant at 5 percent. The results are consistent with Khan and Shaorong (2016). The results are consistent with Khan and Shaorong (2016) for MFIs in South Asia. This implies that as MFIs size increase they tend to decrease loan size and focus on poor's or relatively poor of poor clients. This implies that large MFIs consistence with their original mission of reaching the maximum number of poor people.

4.1.5.3 Operating expense ratio (OER)

The regression result for operating expense ratio indicates positive and significant correlation between operating expense ratio and number of active borrowers of an MFI in Ethiopia as per the result shown in the NAB regression OER is significant at 5% significant level. Based on the regression result, therefore, we fail to reject the null hypothesis that OER positively and significantly affects the NAB of MFIs in Ethiopia. This indicates that there is clear evidence that microfinance institutions active borrowers (breadth) are dependent on their operating expense ratio, and also OER negatively insignificant with the average loan balance this

means when the average loan balance increases the operating expense incurred tends to be constant or no change.

4.1.5.4 Age of MFIs

The Age of microfinance institutions refers to the period that an MFI has been in operation since its initial inception. The research result showed that age of an MFI has a positive significant effect on the average loan size at 5% significant level and positively insignificant with NAB thus the experience of micro finance affects the outreach performance the firm to the poor clients in terms of depth as age increases its depth or the minimal average loan size should also increase. The finding on the impact of experience of microfinance on average loan size by Cull et al (2007), Bogan et al (2007), and Robinson (2001) also agree with this particular finding. Based on the regression result fail to reject the null hypothesis that there is significant relationship between age and operational outreach of MFIs in Ethiopia. This research result is against with research result of Nadiya (2011) and Nyamsogoro (2010), that it is not significant in explaining the change in outreach related with its age.

4.1.5.5 Return on equity

ROE positive influence outreach of MFIs approximated by ALS. A result implies that increase in value of ROE results in the increase in average loan balance per borrower. The coefficient value of ROE is 1.213837 and is significant at 5 percent. This implies that as MFIs tend to focus on increased profitability this may be achieved when they increase the average loan balance per borrower or increase their depth of in terms of their view point not from poor's angel. Findings of this study are in accordance with Kipesha and Zhang (2013) for MFIs in East Africa.

According to the regression result analysed above now we can generate, the operational model for breadth (NAB) and depth (ALS) of Ethiopian MFIs as presented in chapter three.

The estimated models are the following:

$$ALS_{it} = \beta_0 + \beta_1 AGE_{it} + \beta_2 PAR_{it} + \beta_3 OER_{it} + \beta_4 ROE_{it} + \beta_5 SIZE_{it} + \epsilon_{it}$$

β_0 is the constant term showing the value of FSS, when all the coefficient of the independent variables are zero,

AGE Grants for age of a MFI i at time t ,

OER it is the operating expense ratio of a MFI I at time t ,

PAR it is portfolio at risk of a MFI i at time t,

ROE it is the return on equity by a MFI i at time t,

SIZE it is the size of a MFI i at time t, and

ε_{it} is the error term of an MFI i at time t.

Now based on the regression results presented in Table 4.10, the model of this study can be written as follows:

$$ALS = 15.03302 + 0.014795AGE - 0.724885PAR + 2.578967OER - 0.252452ROE - 0.108238SIZE$$

Table 4.7 Summary of hypothesized and actual impact

No	Variable standard	Variable standard	Variable name in regression model	Expected effect	Actual Effect
1	Return on Equity Ratio	(net operating income – tax) / average equity	ROE	Significance negative	In significant negative
2	Age of MFIs	Age of MFIs since their establishment	AGE	Significance positive	Significance positive
3	Operating Expense Ratio	The ratio of operating expense to the gross loan portfolio or average outstanding	OER	Significance positive	significant positive

4	Portfolio at risk	unpaid balance of past due loans with overdue / gross outstanding loan portfolio	PAR	Significance negative	Significance negative
5	SIZE of microfinance		SIZE	Significance positive	Significance positive

CHAPTR FIVE

CONCLUSIONS AND RECOMMENDATIONS

The preceding chapter presented the results and discussion, while this chapter deals with the conclusions and recommendations based on the findings of the study. Accordingly, this chapter is organized into three sub-sections. The first section presents the summary, second conclusions and the third presents the recommendations.

5.1 Conclusions

The study has contributed to existing literature as it is among few of the pioneer studies to identify the factors that influence the outreach performance of MFIs. This study has highlighted the trade-off between the depth and breadth of outreach as well as the institutional factors that drive microfinance outreach with a focus on Ethiopia. The study used correlation and RE regression methodology to show the outreach performance of MFIs. Our results provide supportive evidence to the higher operating expense proposition for MFIs in the industry. Evidently, most institutions still struggle to cover their operating expense with little returns and serving poor clients appears to be inefficient. This has implications for industry sustainability, efficiency and outreach to the poor. Furthermore, the results show convincingly that a trade-off exists between the depth and breadth of outreach of MFIs in Ethiopia. This has clear policy implication: MFIs that focus attention on reaching the relatively poor with financial services are likely to miss out in their effort to reach a large number of borrowers. This highlights the cost implication involved in reaching the poor and designing financial products that meet their needs.

This study also identified the impact of ROE, PAR, OER, AGE, and SIZE on the outreach performance by using balanced panel data of 12 MFIs from the year 2010-2018. Findings of the current study are important for the policy makers and microfinance researchers. Results of

regression analysis suggest that outreach of MFI approximated by ALS is positively influenced by ROE and negatively influenced by size of MFI. Additionally, BLO, and OER does not influence depth of outreach. Large MFIs tend to focus on small loan size which shows consistency of MFIs for its original mission. On the other hand, results suggest that profitable MFIs usually focus on very poor customers. the portfolio at risk negatively influences the outreach performance of MFI. MFIs with greater asset proportion or with large size also strongly positively influence the outreach performance of MFIs.

Furthermore, the study revealed a number of institutional level factors that strongly influence the outreach performance of institutions. The main drivers of MFIs outreach are the AGE, OER, PAR, and ROE. While the SIZE only drives MFIs depth of outreach.

5.2 Recommendations

The main recommendations emanating from the study is for the management of MFIs and policy review. The study recommends that managers of MFIs should make conscious efforts and create a balance in the attainment of the social goals of the institutions in accomplishing both the depth and breadth dimensions of outreach.

This calls for proper planning and efficient goal monitoring from management. Periodic analysis of outreach data at the firm level needs to be given a high priority to supporting timely decision-making in setting realistic outreach targets and effective monitoring of planned activities implemented. Low cost of outreach but efficient technologies (e.g. M-Pesa) should be adopted to help reduce cost, improve outreach of MFIs.

In addition, based on the findings of the study the researcher points out some recommendations that would assume paramount importance if implemented by the microfinance institutions to ensure their outreach to the poor's.

The research found that size of an MFI is significant in achieving operational outreach; therefore, MFIs should increase their value of total assets. If the things they own are as great as possible, they will be sure to be reached in terms of minimum average loan size to the poorest. Because minimum average loan size is the first step to MFIs outreach in depth.

As indicated in the study, in order to improve the breadth of outreach, microfinance institutions have a role to reduce costs or minimize operating expense to the possible minimum extent so as to reduce the overall cost of operation of its portfolio using different cost reduction mechanisms.

The findings point out that at there are an increase in the breadth of outreach (number of active borrower) will lead to the financial self –sufficiency or to increase its profitability. Other things held constant large number of borrower lead to MFI become more profitable. Thus, MFIs in Ethiopia should reach higher number of poor so that, for one thing their objectives of reaching the poor will be achieved and for the other thing, the number of borrowers will be increased and the cost spend to serve the borrowers will be reduced due to the economies of scale. However, when we see the industry average that an MFI is reaching, it is still very low as compared to the number of populations in the country

Generally, to reach higher number of poorest societies with minimum average loan balance, MFIs should increase their breadth of outreach and depth reduce the operating expense, manage its portfolio quality to generate revenue and increase their value of total asset.

Suggestions for further research

This research examined the influence of loan outreach on microfinance specifically focusing on depth of outreach. Therefore, further study may also consider the influence of loan on outreach of microfinance by establishing their relationship.

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Appendix

Dependent Variable: ALPB

Method: Panel Least Squares

Date: 12/28/20 Time: 09:37

Sample: 2010 2018

Periods included: 9

Cross-sections included: 12

Total panel (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.503910	0.437924	3.434179	0.0009
AGE	0.014795	0.004259	3.473372	0.0008
OER	2.578967	1.164299	2.215039	0.0290
PAR	-0.724885	0.350095	-2.070539	0.0409
ROE	-0.252454	0.298474	-0.845816	0.3996
SIZE	-0.108738	0.021297	-5.105695	0.0000
R-squared	0.649552	Mean dependent var		1.372956
Adjusted R-squared	0.632373	S.D. dependent var		1.132113
S.E. of regression	0.686425	Akaike info criterion		2.139315
Sum squared resid	48.06035	Schwarz criterion		2.288322
Log likelihood	-109.5230	Hannan-Quinn criter.		2.199732
F-statistic	37.81117	Durbin-Watson stat		0.917400
Prob(F-statistic)	0.000000			

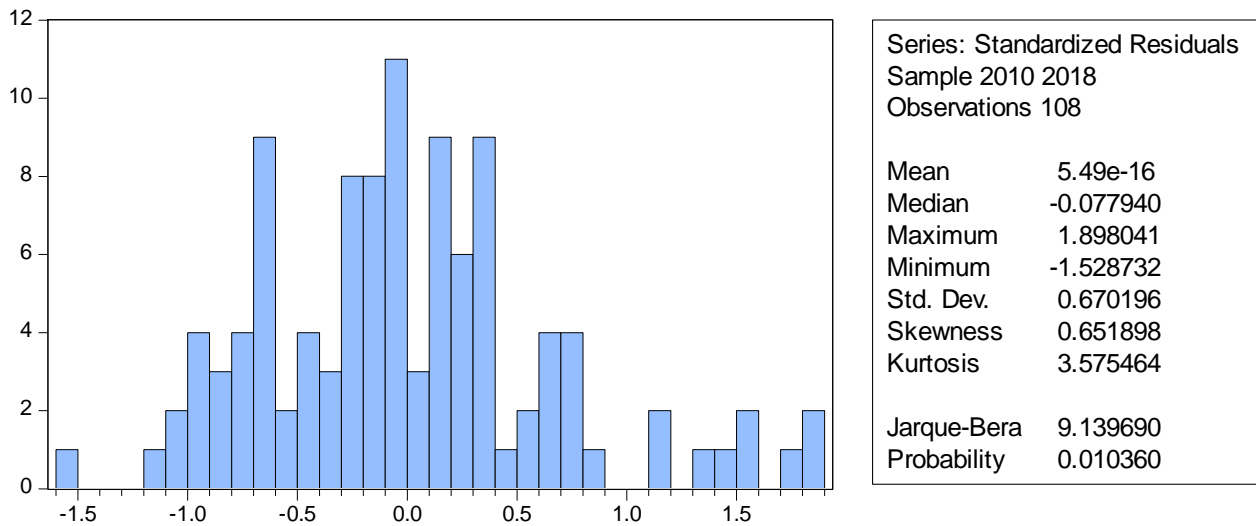
	ALPB	AGE	OER	PAR	ROE	SIZE
Mean	1.372956	44.30556	0.194739	0.328618	0.343151	8.863835
Median	1.238500	51.50000	0.181031	0.290336	0.304705	5.539866
Maximum	3.971000	98.00000	0.460478	0.984115	0.997755	16.76304
Minimum	0.105000	5.000000	0.080217	0.023281	0.012057	4.258956
Std. Dev.	1.132113	24.54234	0.059206	0.207577	0.231707	4.960461
Skewness	0.459194	-0.010878	1.541462	0.996446	1.154471	0.543539
Kurtosis	2.033284	1.915607	6.987515	4.117686	4.120184	1.358101
Jarque-Bera	8.000892	5.293713	114.3212	23.49380	29.63711	17.44906
Probability	0.018307	0.070874	0.000000	0.000008	0.000000	0.000163
Sum	148.2792	4785.000	21.03182	35.49072	37.06031	957.2942
Sum Sq. Dev.	137.1397	64448.92	0.375066	4.610423	5.744646	2632.861
Observations	108	108	108	108	108	108

	ALPB	AGE	OER	PAR	ROE	SIZE
ALPB	1.000000	0.716914	0.051294	-0.308581	-0.200113	-0.758424
AGE	0.716914	1.000000	-0.041008	-0.202305	-0.245048	-0.760148
OER	0.051294	-0.041008	1.000000	0.264048	-0.076779	0.082481
PAR	-0.308581	-0.202305	0.264048	1.000000	-0.069795	0.314842
ROE	-0.200113	-0.245048	-0.076779	-0.069795	1.000000	0.144343

SIZE -0.758424 -0.760148 0.082481 0.314842 0.144343 1.000000

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	21.41754	Prob. F(2,100)	0.0000
Obs*R-squared	32.38833	Prob. Chi-Square(2)	0.0000
F-statistic	1.572770	Prob. F(20,87)	0.0783
Obs*R-squared	28.67901	Prob. Chi-Square(20)	0.0943
Scaled explained SS	32.94144	Prob. Chi-Square(20)	0.0342



Dependent Variable: ALPB

Method: Panel Least Squares

Date: 12/28/20 Time: 09:45

Sample: 2010 2018

Periods included: 9

Cross-sections included: 12

Total panel (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.569014	0.354720	1.604121	0.1122

AGE	0.008884	0.004160	2.135805	0.0354
OER	2.794501	0.860164	3.248802	0.0016
ROE	-0.113893	0.244878	-0.465100	0.6430
PAR	0.068744	0.252381	0.272381	0.7859
SIZE	-0.013244	0.019058	-0.694969	0.4888

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.883904	Mean dependent var	1.372956
Adjusted R-squared	0.863492	S.D. dependent var	1.132113
S.E. of regression	0.418282	Akaike info criterion	1.238221
Sum squared resid	15.92134	Schwarz criterion	1.660408
Log likelihood	-49.86393	Hannan-Quinn criter.	1.409403
F-statistic	43.30222	Durbin-Watson stat	1.150857
Prob(F-statistic)	0.000000		
