

DETERMINANTS OF FINANCIAL SUSTAINABILITY OF MICROFINANCE INSTITUTIONS IN ETHIOPIA

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Abstract: *Microfinance emerged as a noble substitute for informal credit and an effective and powerful instrument for poverty reduction among people who are economically active but financially constrained and vulnerable. The main objective of this study was assessing factors that determine the financial sustainability of MFIs. The study followed a quantitative research approach using balanced panel data set of 208 observations from 26 MFIs over the period 2010-2017. The researcher carried out the analysis using STATA 13 software. The explanatory variables covered under this study were operating expense to total asset ratio, MFIs size, leverage, credit risk, loan intensity, deposit mobilization, depth of outreach, yield on gross loan portfolio, deposit to loan ratio and inflation rate. The robust random effect regression output shows that from explanatory variables; MFI size, loan intensity, deposit mobilization and yield on gross loan portfolio have a significant positive effect on FSS, operating expense to total asset ratio and deposit to loan ratio has negative significant effect, but leverage, credit risk, depth of outreach and inflation rate were insignificant in the determination of financial sustainability of MFIs in Ethiopia. Therefore, Ethiopian MFIs are recommended to increase their gross loan portfolio.*

Key words: microfinance institutions, financial self- sufficiency, outreach, sustainability

1. INTRODUCTION

Microfinance refers to small scale financial services primarily credit and savings service provided for people who farm or fish or herd that operate small enterprises or micro enterprises where goods are produced, recycled, repaired or sold (Robinson, 2001). Microfinance institutions (MFIs) emerged as a noble substitute for informal credit and an effective and powerful instrument for poverty reduction among people who are economically active but financially constrained and vulnerable in various countries (Morduch, 2002). The aims of MFIs as advanced organizations are to facilitate the financial needs of underserved markets as a means of meeting development objectives such as to generate employment, reduce poverty, support in current business or expand their activities, empower women or other disadvantaged population groups, and inspire the development of new business (Bakhtiari, 2006).

Now a day, microfinance has gained a universal recognition as an important tool for reducing

poverty in many developing countries (Bakhtiari, 2006). Poverty is the main issue all over the world especially in under developed and developing countries. Banks and the governments of the countries make efforts to reduce the poverty in their countries but there are lots of issues still prevailing when governments are taken steps to reduce it. Conventional Banks give credit to those people who have some type of collaterals. The issue arises for the poor's because they have no collaterals to get credit easily from the banks (Muhammad, Sohail, Tariq, & Naveed, 2016). As a result, interventions through the delivery of microfinance services are considered as one of the policy instruments to eradicate poverty and microfinance development and sustainability is the forefront development strategy of Africa. After all, for sustainable poverty alleviation, the MFIs themselves should be financially sustainable (Tehulu, 2013).

But to achieve the poverty reduction objective of the microfinance institution, financial sustainability of MFIs is probably the key dimension. Financial

sustainability is necessary to reach large number of poor people on a permanent basis. This allows for the continued operation of the MFIs and the ongoing provision of financial services to the poor (Girma & Jiqin, 2012).

Thus, if MFIs are not able to cover the cost of lending and dependent on external support, that means MFI are not financially sustainable and there is a chance of closing down those MFIs in near future (Kinde, 2012). Hence, it is argued that unsustainable MFIs might help the poor now, but they will not help the poor in the future because the MFIs will be gone (Schreiner, 2000).

Many studies have been done about determinants of financial sustainability of MFIs. For instance, Muhammad et al. (2016) examined determinants of financial sustainability of MFIs in Pakistan using panel data set of 49 MFIs. They found that size of MFIs, capital to asset ratio, yield on gross portfolio, operating expense to asset ratio and portfolio at risk are important factors in determining financial sustainability of MFIs. However, breadth of outreach, cost per borrower, capital structure, productivity and debt to asset ratio shows insignificant impact on financial sustainability of MFIs.

In Ethiopia, some studies are conducted on financial sustainability of microfinance institutions. Kinde (2012) empirically studied factors affecting the financial sustainability of MFIs in Ethiopia using a panel data set of 126 observations from 14 MFIs over the period 2002-2010. He found that breadth of outreach, depth of outreach; dependency ratio and cost per borrower are significant factors. However, no significant association was found between capital structure staff productivity and financial sustainability of MFIs in Ethiopia. Tehulu (2013) used unbalanced panel data from 2004 to 2009 of 23 microfinance institutions in East Africa to identify the factors affecting financial sustainability. The study used binary probit and ordinary probit regression models to identify the factors. The empirical result regression revealed that management efficiency and portfolio at risk is negative and significantly related with financial sustainability. Management inefficiency, portfolio at risk, loan intensity and size are important factors of financial sustainability in East Africa.

With differences in methodology, majority of these studies shows there is inconsistency in their finding and concluded the existence of financial sustainability problem on MFIs. Moreover, Studies on financial sustainability of MFIs in Ethiopia were focused on MFIs that operate on some specific region of the country. For example Adeno (2007), Muluken (2011), Giday (2012) and Dereje and Rijalu (2013) engaged their studies on MFIs that operate in Amhara, SNNPR, Tigray and Oromia regions respectively. In addition to this, some other researchers just like Alemayehu (2008), Kedida (2008), Fekadu (2011) and Girma and Jiqin (2012) conduct their study to examine financial sustainability of some specific MFIs. It revealed that studies that examine sector wise determinants of financial sustainability of MFIs are less in number. In order to fill this geographical area gap and other issues, the researcher is going to examined determinants of financial sustainability in Ethiopian microfinance industry.

2. OBJECTIVE OF THE STUDY

The objective of the study is to assess the determinants of financial sustainability i.e. MFI specific variables and macroeconomic variable of microfinance institutions in Ethiopia.

Research Hypothesis

Based on theories discussed in the literature review section, the following hypotheses are formulated.

Ha1: There is a significant negative relationship between operating expense to total asset ratio and financial sustainability of MFIs in Ethiopia

Ha2: There is a significant positive relationship between size of MFIs and financial sustainability

Ha3: There is a significant negative relationship between leverage and financial sustainability of MFIs

Ha4: There is a significant negative relationship between credit risk and financial sustainability of MFIs

Ha5: There is a significant positive relationship between loan intensity and financial sustainability of MFIs

Ha6: There is a significant positive relationship between deposit mobilization and financial sustainability of MFIs

Ha7: There is a significant positive relationship between depth of outreach and financial sustainability of MFIs

Ha8: There is a significant positive relationship between yield on gross loan portfolio and financial sustainability of MFIs

Ha9: There is a significant positive relationship between deposit to loan ratio and financial sustainability of MFIs

Ha10: There is a significant positive relationship between annual inflation rate and financial sustainability MFIs

3. RELATED LITERATURE REVIEW

The ideas and aspirations towards microfinance are not new. Small, informal savings and credit groups have worked for centuries across the world, from Ghana to Mexico to India and beyond (Helms, 2006). In Europe, as early as the 15th century, the Catholic Church founded pawn shops as an alternative to usurious money lenders. These pawn shops spread throughout the urban areas in Europe throughout the 15th century. Formal credit and savings institutions for the poor have also been around for generations, offering financial services for customers who were traditionally neglected by commercial banks. The Irish Loan Fund system, started in the early 1700s, is an early (and long-lived) example. By the 1840s, this system had about 300 funds throughout Ireland (Mwenda & Muuka, 2004).

In Bangladesh Professor Muhammad Yunus who was the Nobel Prize winner in 2006, disbursed first loans from his own pocket to a group of rural women in Jobra in 1976 and successfully developed the concept of microfinance with his Grameen Bank throughout the country and later the whole world. The Grameen bank, which is now

serves more than 2.4 million clients (94 % of them women) and is a model for many countries (Lejerwood, 1999).

Beginning in the mid-1980s, the subsidized targeted credit model supported by many donors was the object of steady criticism, because most programs accumulated large loan losses and required frequent recapitalization to continue operating. It became more and more evident that market-based solutions were required. This led to a new approach that considered microfinance as an integral part of the overall financial system. Emphasis shifted from the rapid disbursement of subsidized loans to target populations toward the building up of local, sustainable institutions to serve the poor. In the early 1990s the term “microcredit” was replaced by “microfinance” which included not only credits but also other financial services for poor people (Brau & Woller, 2004).

The introduction of the term microfinance followed the success of many microcredit programs around the world and in 1997, during the first Microcredit Summit, 2,900 delegates from 137 countries representing around 1,500 organizations gathered in Washington, D.C. During that occasion the birth of the global industry of microfinance was officially recognized. Since then the focus started to change and move from the predominant welfare idea, where only the provision of credit was considered to be important, to the need of becoming financially sustainable through the provision of a complete range of financial products and to reach more people (Lejerwood, 1999).

Thus, formal microfinance industry in Ethiopia started in 1994/5. In particular, the licensing and supervision of microfinance institution proclamation of the government encouraged the spread of MFIs in both rural and urban areas as it authorized them among other things, to legally accept deposits from the general public (hence diversify sources of funds), to draw and accept drafts, and to manage funds for the micro financing business (Getaneh, 2005). The proliferation of microfinance institutions could indicate the emphasis given to the strategy to fight against poverty in the country. Microfinance initiatives are policy instruments (prime components of the new development strategy). They can create an enabling environment for the poor to increase output and

productivity by inducing technology adoption, improving input supply, and increasing income, reducing hunger and thereby reducing poverty (Wolday, 2001). Currently there are 34 microfinance institutions in Ethiopia, licensed and registered by NBE, following the issuance of proclamation No. 40/96.

3.1. Definition of Microfinance

The definitions of microfinance proposed by some scholars and organizations are seemingly different from one another. However, the essence of the definitions is usually the same. Kinde (2012) defined microfinance the provision of formal financial services to poor and low-income people, as well as others systematically not benefited from the financial system. As noted, microfinance is not only providing a range of credit products (for consumption, smoothing for business purposes, to fund social obligations, for emergencies, etc.) only, but also savings, money transfers, and insurance.

The popularly known institution which is Microfinance Information Exchange (MIX) defined the microfinance institutions as a variety of financial services that target low income clients, particularly women. Since the clients of microfinance institutions have lower incomes or poor and often have limited access to other financial services, microfinance products tend to be for smaller monetary amounts than traditional financial services. These services not only provide micro credit service for those have lower incomes but also include loans, savings, insurance, and remittances.

3.2 Microfinance and its sustainability

Microfinance is the provision of small scale financial services to low income or unbanked people (Hartarska, 2010). It is about provision of a broad range of financial services such as deposits, loans, payment services, money transfers and insurance to the poor and low income households and their farm or non-farm micro-enterprises (Mwenda & Muuka, 2004). Similarly, the Asian Development Bank (ADB) defines microfinance as the provision of a broad range of financial services such as deposits, loans, payment services, money

transfers, and insurance to poor and low-income households and their micro-enterprises.

Sustainability is defined as the ability of an entity to continue a defined behavior indefinitely. In other words, it is the ability of an organization to meet its goals or target over long term. In the context of financial institutions and for firms, this requires private profitability; a return on equity, net of subsidy that exceeds the private opportunity cost of resources (Schreiner, 2000). According to Ejigu (2009) sustainability defined as the ability of a MFI to cover its operating and other costs from generated revenue and provide for profit. It is an indicator which shows how the MFI can run independent (free) of subsidies. This change in emphasis has created a different perspective on the analysis of performance of the MFIs.

The term sustainability has broader dimensions, of which financial sustainability is one of the dimensions. The other dimensions of sustainability are: institutional sustainability, mission sustainability, program sustainability, human resource sustainability, market sustainability, legal policy environment sustainability and impact sustainability (Muhammad et al., 2016).

3.3 Financial Sustainability of Microfinance Institutions

Financial sustainability of microfinance institutions is probably the key dimension of microfinance sustainability. It refers to the ability of MFIs to cover all its costs from its own generated income from operations without depending on external support or subsidy (Meyer, 2002). Financial sustainability also defined as the ability to keep on going towards microfinance objective without continued donor support. These definitions center on one point that is, the ability to depend on self-operation. The definitions also imply the possibility of making profit out of the microfinance operations (Guntz, 2011).

Financial sustainability means the smooth operation of financial institutions with necessary profitability, having adequate liquidity to overcome any challenges of bankruptcy. Put in simple terms, financial sustainability means that the MFI is able to cover all its present costs and the costs incurred

in growth, if it expands operations. Financial sustainability indicates the ability of MFIs to survive in the long-run by means of its own income generating activity without any contributions from donors. The term financial sustainability is defined as having an operational sustainability level of 110% or more, while operational sustainability is defined as having an operational self-sufficiency level of 100% or more (Ledgerwood, 1999).

Financial sustainability refers that the ability of a microfinance provider to cover all of its costs on an unsubsidized basis or without accepting donation. According to the United Nations, sustainability is necessary to reach a larger number of people on an ongoing basis. If MFIs remain dependent on limited donor funding they will be able to reach only a limited number of people. Financial sustainability is not an end in itself but is the only way to reach significant scales (Anupam, Rodolph & Murat, 2004).

3.4 Measuring Financial Sustainability

According to Meyer (2002) financial sustainability can be measured in two stages namely operational self-sufficiency and financial self-sufficiency. Operational self-sufficiency refers to the ability of the MFI to cover its operational costs from its operating income regardless of whether it is subsidized or not. On the other hand, MFIs are financially self-sufficient when they are able to cover from their own generated income, both operating and financing costs and other form of subsidy valued at market prices.

$$\text{Operational Self - Sufficiency (OSS) \%} = \frac{\text{operating income}}{\text{operating expenses}}$$

The above formula indicates or measures the degree to which operating income covers operating expenses. If the calculated figure is greater than 100%, the organization under evaluation is considered to be operationally self-sufficient. In microfinance, operationally sustainable institutions are able to cover their costs through operating revenues (Tehulu, 2013).

$$\text{Financial Self - Sufficiency (FSS) \%} = \frac{\text{adjusted operating income}}{\text{adjusted operating expenses}}$$

This also indicates the degree to which operating income covers adjusted operating expense. The adjustments try to show how the financial picture of the MFI would look on an unsubsidized basis or free from donation. Financial self-sufficiency (FSS) requires adjustments for different reasons.

3.5 Determinants of Financial Sustainability

Different studies by different authors, specifically on the determinants of financial sustainability, found different results on the determinants that affect the financial and operational self-sufficiency of microfinance institutions. This literature is reviewed for the purpose of developing empirical evidence for the independent variables that the researcher think may affect the financial sustainability of MFIs in Ethiopia.

A. Operating expense to total asset ratio

Operating expense to total asset is used as an indicator of management's ability to control costs. High quality management translates into a profitable composition of assets and a low-cost composition of liabilities. An increase in this ratio implies a decrease in the efficiency or quality of management, which will translate into financially not sustainable (Kinde, 2012). More efficient financial institutions tend to have relative lower expenditure per unit and high revenue generated per unit. In other words, efficiency affects sustainability positively through two channels; through cost reduction and revenue increase (Nyamsogoro, 2010). Therefore, a negative relationship between operating expense to total asset ratio and financial sustainability of MFIs is expected.

B. Size of MFIs

Size of MFIs is measured by the natural logarithm of its total assets (Tilahun, 2013). According to Lislev (2012), size of MFIs has significant positive effect on the performance measured by return on asset. Similarly, Cull (2007) also indicates a

positive relation between size of MFIs and financial performance. Studies by Mersland and storm (2009) and Bogan (2007) have reported that size of MFIs is significantly associated with its financial sustainability. There is consensus in academic literature that economies of scale and synergies arise up to a certain level of size. Beyond that level, financial organizations become too complex to manage and diseconomies of scale arise. The effect of size could therefore be nonlinear (Woldeyes, 2012). Natural logarithm of total asset of MFIs is used as a proxy of size.

C. Leverage

The various sources of capital and its combination could affect profitability and therefore, sustainability of microfinance institutions. According to 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 sustainability 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. MFIs with high leverage ratios are relatively less sustainable because of the increased cost of capital and the likelihood of ex-post moral hazard (Nyamsogoro, 2010).

D. Credit Risk

Credit risk concerns the probability that a borrower will default on a loan. Non-performing loans to total loans ratio is used as an indicator of credit risk or quality of loans. Credit risk belongs to the group of factors with the highest impact on MFIs financial sustainability. An increase in provision for loan losses implies a higher cost of bad debt write offs. MFIs facing higher credit risk are likely to be financially unsustainable (Muhammad et al., 2016). Ibrahim (2015) suggested two ways in which a risky loan portfolio will make MFIs financially unsustainable. These are intensive use of the institution's productive resources to service risky loans and higher probability of default.

Therefore, negative relationship between credit risk and financial sustainability of MFIs is expected.

E. Loan Intensity

Gross loan portfolio to total assets ratio is an indicator of loan intensity. It is the ratio of adjusted gross loan portfolio to adjusted total assets. It is an indication of their focus of lending as otherwise these funds could have been utilized for some income generating purpose. Tehulu (2013) also predicted that loan intensity affects positively to financial sustainability and his findings show that the coefficient of gross loan portfolio to total assets ratio is positive and significant at 5% level. Brau and Woller (2004) empirical findings revealed positive relationship between gross loan portfolio to total assets ratio and financial self sufficiency. Based on the prior empirical evidence, the researcher predicts positive relationship between loan intensity and financial sustainability of MFIs.

F. Deposit Mobilization

Deposit to asset ratio is also another variable which is used by different researchers. It measures the portion of total asset of MFIs that is funded by deposits. According to Mwangi (2015) and Muriu (2011) deposit to asset ratio has positive and significant effect on MFIs financial sustainability. He justified that large deposits will lead to reduction of cost of funds of MFIs that may be the reason of improved profitability of MFIs and thus financial sustainability. Deposits have become a key MFI financing option world-wide with special mention of Africa where deposits surpass the volume of loans (Bakhtiari, 2006). Kinde (2012) indicates that it is through savings that MFIs can expand loan portfolios, improve their sustainability, reduce lending rates and move towards satisfying demand.

G. Depth of Outreach

Depth of outreach defined as the average gross loan portfolio divided by the number of active borrowers. According to Schreiner (2000) the relationship between depth of outreach and financial self-sustainability is multidimensional. He found that depth of outreach has a positive relationship with financial self-sufficiency. There is

a negative correlation between depth of outreach and subsidy dependency index. This exhibits that there is a positive relationship between sustainability and depth of outreach.

H. Yield on gross loan portfolio

Yield on gross portfolio is a percentage that shows the institutions ability to generate revenue to cover its financial and operational expenses. It represents the average gross returns as a proportion of portfolio outstanding. It shows the amount received from interest payments during the period by microfinance institutions.

I. Deposit to loan Ratio

Deposits to loans ratio is the ratio of savings to gross loan portfolio. It measures how MFIs is dependent on deposits as a source of funds for extending loan to its clients. It is a useful instrument to determine MFIs liquidity. Deposits and loans are the two main factors for determining the financial self-sufficiency of MFIs since it leads to earn interest income. Therefore, the ratio of deposits to gross loan portfolio is very important (Beg, 2016). Deposit to loan ratio implies that the MFI is relying on deposits to make loans to its clients.

J. Inflation Rate

Inflation is the rate at which the general level of prices for goods and services is rising. Inflation is well related with MFIs financial self-sufficiency. It entail high cost as more business operation and large branch network rise cost but also more revenue from MFIs float, this positive link depicts that MFIs income increase with inflation more than their cost (Niamosgoro, 2008). Inflation affects the real value of costs and revenues though it may have a positive or negative effect on profitability depending on whether it is expected or unexpected.

4. METHODS

To achieve the intended objectives, to perform descriptive analysis and establish the cause and effect relationship between variables, the researcher applied descriptive and explanatory research

design. In this study the researcher used quantitative research approach since both the independent and dependent variables can be measured quantitatively; in addition to this, by considering the research problem and objectives along with the philosophy of different research approaches, quantitative research approach is found to be appropriate.

4.1 Study Population

The study population includes all microfinance institutions currently operating in Ethiopia. According to (NBE, 2018), there are 34 MFIs which are providing a microfinance service to the poor society in Ethiopia.

4.2 Sample size and procedure

The researcher employed purposive sampling technique to select sample MFIs. The reason why the researcher chooses this technique is based on availability of full data for the last eight years. Based on this justification 26 MFIs are selected as a sample which represents 76% of total number of MFIs in Ethiopia.

4.3 Nature of Data and Data Collection Instrument

Given the research design, secondary data used to achieve objectives of the study. Data was collected from National Bank of Ethiopia, Association of Ethiopian Microfinance Institutions and from Ministry of Finance and Economic Development. The main source of data for the study is audited financial statements (balance sheet and income statement) of MFIs.

Panel data has the advantage of giving more informative data as it consists of both the cross sectional information, which captures individual variability, and the time-series information, that captures dynamic natures of the data (Gujarati, 2004). The researcher used 8 years panel data for 26 MFIs from 2010-2017. The study has total observation of 208 i.e.(26 MFIs x 8 years).

4.4 Method of Data Analysis and Presentation

Descriptive statistics and regression analysis are used to examine the effect of explanatory variables on financial sustainability of MFIs in Ethiopia. That is using mean, minimum, maximum and standard deviation. Then, correlation analyses between dependent and independent variables applied and finally a linear regression using random effect model have been conducted to determine the relative effect of independent variables on financial sustainability of MFIs in Ethiopia.

4.5 Model specification

To examine the determinants of financial sustainability of MFIs in Ethiopia, the researcher employs panel data procedures since the sample contains data across MFIs and over time.

Panel data can address a broader range of issues and tackle more complex problems than pure time series or pure cross-sectional data alone. It is important to examine how variables, or the relationships between them change dynamically (over time). It also helps to mitigate problems of multicollinearity. Through combining cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test, by employing information on the dynamic behavior of a large number of entities at the same time (Brooks, 2008).

In order to examine the determinants of financial sustainability of MFIs in Ethiopia, random effect model was applied after the result of a test that distinguishes whether random or fixed effect model is consistent called hausman test. The model is specified as follows:

$$Y_{it} = \beta_0 + \sum \beta X_{it} + \epsilon_{it} \dots \dots \dots \text{Equation 1}$$

Extending Equation 1 to reflect all explanatory variables, the following regression model is obtained:

$$FSS_{it} = \beta_0 + \beta_1 OEA_{it} + \beta_2 SIZ_{it} + \beta_3 LEV_{it} + \beta_4 CR_{it} + \beta_5 LI_{it} + \beta_6 DMO_{it} + \beta_7 DOU_{it} + \beta_8 YGL_{it} + \beta_9 DLR_{it} + \beta_{10} INF_{it} + \epsilon_{it} \dots \dots \dots \text{Equation 2}$$

Where:

FSS = Financial self sufficiency

OEA = Operating expense to total asset ratio

SIZ = Size of MFIs

LEV = Leverage

CR = Credit risk

LI = Loans intensity

DMO = Deposit mobilization

DOU = Depth of Outreach

YGL = Yield on gross loan

DLR = Deposit to loan ratio

INF = Annual inflation rate

ε = is the error term

β 0 = Constant

β 1, 2, 3,10 are coefficients to be estimated

i = MFI i, t = time t

5. ANALYSIS AND INTERPRETATION

5.1 Descriptive analysis

Statistical measures are mostly methods of handling quantitative information. These procedures have two principal advantages. First, it enables to depict and compare variables numerically. Second they enable researchers to organize, summarize and describe observations. Techniques used for these purposes are termed as descriptive statistics (Saunders et al., 2009).

The data for 26 MFIs was taken from National Bank of Ethiopia, Association of Microfinance Institutions and Ministry of Finance and Economic

Development for the period covered from 2010 to 2017. This data is balanced panel data with total observation of 208. For this observation the

dependent variable and independent variables are described below.

Table 1: Descriptive Statistics of dependent and independent Variables

Variables	Observation	Mean	Std.Deviation	Minimum	Maximum
FSS	208	1.023834	.4963047	.0817283	3.984409
OEA	208	.149429	.1188328	.0258536	.9106292
SIZ	208	7.979527	.9857593	5.796241	10.28578
LEV	208	2.056852	1.909566	.1201123	18.0957
CR	208	.0029012	.0185156	.0001237	.0654896
LI	208	.6971607	.1628921	.1230794	.9185542
DMO	208	.3129101	.1248619	.0296061	.6802027
DOU	208	3.545234	.3692462	2.689309	5.267484
YGL	208	.1758081	.0800289	.0142642	.6615958
DLR	208	.4969093	.3244141	.0416485	3.26714
INF	208	10.71254	4.867365	7.321393	20.81219

Source: STATA 13 output

The table 3 described above shows the mean, minimum, maximum and standard deviations of 26 MFIs for the period of 8 years from 2010-2017.

The dependent variable in this study is FSS. It indicates the ability of MFI to cover all of its operating costs and costs of capital without depending on subsidies. As indicated on table 3 the mean of financial self-sufficiency is 1.0238 (102.38%). It indicates that, on average Ethiopian MFIs are financially sustainable. However the standard deviation for this variable is about 0.5, which indicates the existence of dispersion in the financial sustainability of MFIs studied. Even though the mean value of FSS shows on average MFIs in Ethiopia are financially sustainable, the minimum value for this variable shows that

financially self insufficient MFIs are there. The maximum value for FSS implies that some MFIs are there that have high FSS level beyond the average. This includes Amhara credit and saving institution (ACSI), Dedebit microfinance institution, Omo microfinance institution and Oromia microfinance institution. i.e. the giant MFIs.

Operating expense to total asset ratio measures how microfinance institution's management has been efficient in reducing operating costs at a given level of operation. The lower the operating expense ratio indicates efficiency in microfinance institutions cost reduction strategy. If a MFI is operating at lower cost, which means, all things being equal it is efficient. The operating expense ratio for the

Ethiopian microfinance industry shows 0.1494 in its mean. This indicates that on average they are incurring 14.94 cents in operating expense for each birr in total asset. The minimum and maximum value of the variable is 0.0258 and 0.9106 respectively. Some highly efficient institutions incur operating expense of 2.58 cents for each birr in total asset. On the other hand, inefficient MFIs in the industry incur an operating expense of 91.06 cents for each birr on their total asset.

Size which is measured by the total asset of the institutions, measures whether they are large enough to be operationally as well as financially sustainable and cover their operational costs or not. The mean value of the variable is 7.9795 in its natural logarithm value, whereas the minimum and maximum values are 5.796 and 10.285 respectively. These values are in their log form and when they are transformed into their real values they become Br 95,389,374, Br 625,174 and Br 19,275,249,131 for the mean, minimum and maximum values respectively.

The mean leverage value is 2.06 indicating that debt financing has domination over equity financing in Ethiopian Microfinance industry. As indicated on table 3 the standard deviation for the variable is 1.91, which indicates the existence of dispersion in the capital structure of MFIs.

Credit risk represents the balance of loan loss provision out of the total loan given to borrowers. The mean value of credit risk is .0029(0.29%). It implies that Ethiopian MFIs serve loan to borrowers with low credit risk.

The average balance of outstanding loans is an indicator of depth of outreach. Smaller amount of average loan size per borrower indicates better outreach to the poor clients. The mean average loan size for MFIs is 3.54 in its natural logarithm value.

In real terms, the value for the mean is Br 3,509. However, the maximum value is Br 185,133 which indicates that, there are MFIs in Ethiopia that have high depth of outreach who serving relatively non-poor clients.

Yield on gross loan portfolio indicates the ability of MFIs to utilize the short term assets to generate cash financial revenue. It indicates the efficiency with which a MFI has utilized its resources to generate cash revenue. The higher the ratio, the better it indicates microfinance efficiency. The mean descriptive statistics for this variable shows that MFI in Ethiopia generates 0.1758. This means that they generate on average 17.58 cents cash for each single birr in the outstanding loan portfolio. The minimum and maximum yield on the gross loan portfolio for this study is 0.0143 and 0.6616 respectively. This means some of the inefficient MFIs generates only 1.43 cents for each single birr on the gross loan portfolio while the efficient MFIs generates up to 66.16 cents per each single birr on the gross loan portfolio.

The deposit to loan ratio had a mean value of 0.497, which demonstrates that MFIs in Ethiopia, on average used only 0.497 deposits as a source of funds for loan portfolios to achieve financial self sufficiency. This low ratio of deposit to loan may contribute negatively for MFIs financial self sufficiency. A ratio of 1 means that MFIs fully finance their loans from deposits (Girma & Jiqin, 2012). The standard deviation for deposit to loan ratio is 0.324, which indicates the existence of dispersion in the deposit to loan ratio of the MFIs studied. During the study period covered the mean value of inflation was found to be 10.7% which is greater than the average of the entire African continent which was 9% as shown in the Mix Market's report (2017).

5.2 Regression Result

Table 2: Robust random effects model regression

Random-effects GLS regression		Number of obs = 208			
Group variable: MFIs		Number of groups = 26			
R-sq: within = 0.4982		per group: min = 8			
between = 0.7431		avg = 8.0			
overall = 0.6613		max = 8			
Wald chi2(10) = 220.94		Prob> chi2 = 0.0000			
corr(u_i, X) = 0(assumed)					
(Std. Err. Adjusted for 26 clusters in MFIs)					
FSS	Coef.	Robust Std. Err.	Z	P> z	[95% Conf. Interval]
OEA	-1.656459	.3115415	-5.32	0.000*	-2.267069-1.045849
SIZ	.2437717	.0614674	3.97	0.000*	.1232978.3642456
LEV	-.0065252	.0085316	-0.76	0.444	-.0232469.0101965
CR	-.9098659	1.001727	-0.91	0.364	-2.8732141.053483
LI	.4215587	.1605046	2.63	0.009*	.1069755.7361418
DMO	.848215	.313665	2.70	0.007*	.23344281.462987
DOU	-.0280106	.0630977	-0.44	0.657	-.1516798 .0956585
YGL	3.129849	.5540563	5.65	0.000*	2.0439184.215779
DLR	-.4857279	.1188301	-4.09	0.000*	-.7186306-.2528252
INF	.0011594	.0021167	0.55	0.584	-.0029893.0053082
_cons	-1.43908	.4806365	-2.99	0.003	-2.38111-.4970497
sigma_u	.20933685				
sigma_e	.22066147				
rho	.47368183 (fraction of variance due to u_i)				
* shows significant at 99% level of confidence					

Source: STATA output for random effect regression analysis

As seen from the above table the Random-effects regression is conducted for balanced data set with 208 observations, which is collected from 26 MFIs from 2010 to 2017. The result have 0.6613 overall R square value, which shows about 66% of variation in the dependent variable is due to explanatory variables included in this study and the

remaining 34% variation is due to unobserved variables or error term. In the following paragraph the explanatory variables are discussed based on the above result and some empirical findings. From the above table Coefficient denotes the coefficients of explanatory variables that indicate how much

dependent variable changes when the independent variable increases by one percent.

- **Operating expense to total asset ratio**

Operating expense to total asset ratio is measured by the ratio of operating expense to total asset. It has a negative and statistically significant impact on financial sustainability at 1% significance level. The interpretation is that an increment in operating expenses including salary, administrative expense, depreciation and board fee, reduces the profitability of MFIs and it may be a reason for them to be financially unsustainable.

The Coefficient of operating expense to total asset ratio is -1.656, which indicates when operating expense to total asset ratio increases by 1% all other things being equal, the financial self-sufficiency ratio decreases by 1.656 and contrary when the operational expense ratio decreases by 1% all other things being equal, the financial self-sufficiency ratio increases by 1.656. Based on the regression result, the researcher fail to reject the alternative hypothesis that operating expense to total asset ratio has negative and significant effect on FSS of MFIs in Ethiopia. This indicates that there is clear evidence that MFIs financial sustainability is dependent on their operating expense to total asset ratio.

- **MFIs Size**

Natural logarithm of total asset is the proxy measure for size of MFIs. The econometric result of regression analysis revealed that size is strongly significant at 1% level of significance and positively associated with financial sustainability with a p-value of 0.000. Positive relationship between size of MFIs and their financial sustainability indicates that large MFIs are more financially sustainable.

For one percent increase in size of MFIs, financial self-sufficiency ratio is expected to increase by 0.243 percent, holdings all other variable constant. They found that MFIs size is positive and significantly linked to financial self-sufficiency. Based on the regression result, the researcher fail to reject alternative hypothesis articulated as size of

MFIs has positive and significant relationship with financial sustainability of MFIs in Ethiopia.

- **Leverage**

The leverage (LEV) variable here represents the percentage of debt to equity. The result from the econometric analysis indicates the variable has a negative and statistically insignificant impact on financial sustainability. For one percent increase in debt to equity ratio of MFIs, financial self-sufficiency ratio is expected to decrease by 0.006 percent, holdings all other variable

Therefore, based on the regression result from the study, the researcher rejects the alternative hypothesis which was formulated to show the existence of a significant negative relationship between debt to equity ratio and financial self-sufficiency of Ethiopian MFIs.

- **Credit Risk**

Credit risk indicates how much a MFI is efficient in making collections of loans. The result of regression analysis revealed that the coefficient is insignificant and negatively associated with financial self-sufficiency. The negative coefficient of this variable indicates that credit risk decrease the financial sustainability of Ethiopian MFIs. For one percent increase in credit risk of MFIs, financial self-sufficiency ratio is expected to decrease by 0.91 percent, holdings all other variable constant. Based on the regression result, the researcher rejects the alternative hypothesis that credit risk has negative and significant effect on FSS of MFIs in Ethiopia.

- **Loan intensity**

Loan intensity represents the percentage of gross loan portfolio to total asset. The variable is statistically significant and positively associated with financial sustainability at 1% significance level with a p-value of 0.009. For one percent increase in loan intensity of MFIs, financial self-sufficiency ratio is expected to increase by 0.421 percent, holdings all other variable constant. Therefore, based on the regression result the researcher fail to reject the alternative hypothesis which was formulated as there is positive

significant relationship between loan intensity and financial sustainability of Ethiopian MFIs.

- **Deposit Mobilization**

Deposit mobilization represents the percentage of total deposit to total asset. The variable is statistically significant and positively associated with financial sustainability at 1% significance level with a p-value of 0.007. For one percent increase in total deposit to total asset ratio of MFIs, financial self-sufficiency ratio is expected to increase by 0.85 percent, holdings all other variable constant. This shows that financial sustainability is positive and significantly influenced by the ratio of total deposit to total asset.

- **Depth of Outreach**

Depth of outreach is defined as gross loan portfolio divided by the number of active borrowers. The result from the econometric analysis indicates that the variable has a negative and statistically insignificant effect on financial sustainability. For one percent increase in gross loan portfolio to number of active borrowers ratio of MFIs, financial self-sufficiency ratio is expected to decrease by 0.028 percent, holdings all other variable constant.

Thus, based on the regression result from the study, the alternative hypothesis articulated as there is positive significant relationship between depth of outreach and financial self-sufficiency is rejected.

- **Yield on gross loan portfolio**

The yield on gross loan portfolio is strongly significant and positively associated with financial self-sufficiency at 1% significance level with a p-value of 0.000. It indicates that increasing interest revenue improves financial sustainability of Ethiopian MFIs. The econometric result of regression analysis revealed that for one unit increase in a yield on gross loan portfolio, financial self-sufficiency ratio is expected to increase by 3.13 units, holdings all other variables constant. This suggest that yield on gross loan portfolio is significant variable influencing financial sustainability of MFIs.

- **Deposit to loan ratio**

Deposit to loan ratio is strongly significant and negatively associated with financial self-sufficiency at 1% significance level with a p- value of 0.000. The result shows that a unit increase in deposit to loan ratio led to a decrease in financial self-sufficiency by 0.486. Therefore based on regression result, the alternative hypothesis articulated as deposit to loan ratio is positively associated with financial self-sufficiency is rejected.

- **Inflation Rate**

Inflation rate is statistically insignificant in the determination of Ethiopian MFIs financial self-sufficiency even at 10% level of significance with a p – value of 0.584. The coefficient of this variable is 0.001 shows the relationship between inflation rate and financial self-sufficiency is positive that means for one percent increase in inflation rate, financial self-sufficiency ratio increased by 0.001 percent, holdings all other variable constant.

Therefore, based on the regression result the alternative hypothesis is rejected which was formulated as there is positive significant relationship between inflation rate and financial sustainability of Ethiopian MFIs.

6. SUMMARY AND CONCLUSION

During the period covered in this study Ethiopian MFIs maintained an average FSS ratio of 102.38%. Given the international requirement FSS ratio of 100%, the result is an indication of the fact that much of Ethiopian MFIs were financially self-sufficient during the study period. The result above 100% means that it is possible for Ethiopian MFIs to cover all costs and their obligations without ongoing subsidy. Comparison of Ethiopian MFIs FSS with other countries indicated that MFIs operating in Eastern African and Southern African regions had a mean FSS score of 116% (Mix Market, 2017). This is more than the mean FSS value of Ethiopian MFIs. Hence, Ethiopian MFIs should maintain a sufficient level of FSS ratio to ensure their financial sustainability.

The study shows that the operating expense ratio for Ethiopian microfinance industry is 0.1494 in its

mean. This indicates that on average they incur about 15 cents in operating expense for each birr in total asset. Some highly efficient institutions incur operating expense of 2.6 cents for each birr in total asset. On the other hand, inefficient institutions in the industry incur an operating expense of 91 cents for each birr on their total asset.

Ethiopian MFIs maintained deposit to loan ratio of 50% while MFIs in Central Africa have mean score of deposit to loan ratio of 74.8% indicating that MFIs in these regions have mobilized higher commercial sources (savings) to finance their loan than MFIs in Ethiopia. Therefore, this can enable the researcher to infer most of Ethiopian MFIs are not deploying deposit to finance their loan.

During the study period covered the mean value of inflation was found to be 10.7% which is greater than the average of the entire African continent which was 9% as shown in the Mix Market's report. The mean average loan size for MFIs is 3.54 in its natural logarithm value. In real terms, the value for the mean is Br 3,509. However, the maximum value is Br 185,133 indicates that there are MFIs in Ethiopia that have high depth of outreach who serving relatively non-poor clients.

Understanding factors affecting MFIs financial sustainability is essential, since financial self-sufficiency is the base for existence in the business. The objective of this study was assessing factors that determine the financial sustainability of Ethiopian MFIs under the study period, covering 8 years period (2010 – 2017). Dependent variable was financial self-sufficiency and the explanatory Variables incorporated under this study were both MFIs specific (operating expense to total asset ratio, MFIs size, leverage, credit risk, loan intensity, deposit mobilization, depth of outreach, yield on gross loan portfolio and deposit to loan ratio) and external or macroeconomic factor (inflation rate).

The data for this study was collected from National Bank of Ethiopia, Association of Ethiopian Microfinance Institutions and from Ministry of Finance and Economic Development. The study used audited financial statements (balance sheet and income statement) of 26 MFIs. After collecting the necessary data from the above listed source, the researcher summarize the data to compare variables

numerically and enable researcher to organize, summarize, and describe observations.

The robust random effect regression analysis shows that, operating expense to total asset ratio, MFIs size, loan intensity, deposit mobilization, yield on gross loan portfolio and deposit to loan ratio were significant at 1% significance level. While, leverage, credit risk, depth of outreach and inflation rate were insignificant in the determination of financial sustainability of MFIs in Ethiopia.

From explanatory variables incorporated in this study the variable MFIs size, loan intensity, deposit mobilization and yield on gross loan portfolio were found to be positive significant effect on Ethiopian microfinance institutions financial sustainability. The effect of operating expense to total asset ratio and deposit to loan ratio on financial sustainability of Ethiopian MFIs was found to be negative and significant. On the other hand the variable inflation rate has statistically insignificant and positively related with financial sustainability. The effect of leverage, credit risk and depth of outreach on financial sustainability of Ethiopian MFIs was found to be negative and insignificant.

7. RECOMMENDATION

Based on the finding of this study the following recommendations are given;

Financial self-sufficiency has negative and significant relationship with operation expense to total asset ratio. Low operating expense to total asset ratio shows management's good expense management practice while, high operating expense to total asset ratio shows management's poor expense management. Therefore it is recommended that Ethiopian microfinance institutions should have effective and efficient expense management practice. This could be through installing software programs that helps to facilitate their operation and decrease salary expenses.

Given that the relationship between MFIs financial sustainability and size is positive and significant, Ethiopian MFIs should have to increase their total asset through asset accumulation or wealth creation together with return maximization. They should also increase their total asset through merger and

acquisitions to enhance their financial sustainability. Given the effect of loan intensity on financial self sufficiency of MFIs is positive and significant; Ethiopian MFIs should increase their loan portfolio through increasing number of borrowers.

Because the effect of deposit mobilization is positive and significant, being taking into account the risk of liquidity, Ethiopian MFIs should strive to mobilize deposits from their clients and institute effective mechanism to protect their clients' deposits so that they enhance their financial sustainability. Since yield on gross loan portfolio has significant positive effect on financial self sufficiency, Ethiopian MFIs should increase their interest revenue by increasing number of borrowers.

Given that the relationship between MFIs financial sustainability and deposit to loan ratio is negative and significant, Ethiopian MFIs are recommended to adjust the ratio of deposit and loan. If the increment of deposit is high over the increment of loan, it will have negative effect on financial self sufficiency of MFIs. This is due to liability nature of deposit. Thus, to be financially sustainable, the increment of loan should be always greater than the increment of deposit. Since loan is an investment for MFIs, the return from it open the way for financial self-sufficiency.

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