Determinants of Financial and Operational Sustainability of Microfinance Institutions in Ethiopia

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Abstract: Grassroots of people in developing countries have been given access to formal financial services through microfinance programs. FSS and OSS has been defined by various researchers differently. As such there is no clear cut definition of the word FSS and OSS. So, this study was conducted to fill the gap. From the total of thirty four MFIs which are operating in the country and fifteen MFIs have been selected for the study by way of a purposive sampling technique. This study is based on quantitative research approach using panel data and multiple regression model and Audited Financial statement data for eight years are collected by using secondary data from NBE, from the annual bulletin of AEMFI and mix-market database. The study used SPSS version 24.0 and STATA version 13.0 to conduct analysis. The study shows that MFIs in Ethiopia at the period financially not self-sufficient but operationally self-sufficient. Therefore Researcher recommends that to made sustainable MFIs in Ethiopia should have increases yield gross loan portfolio, and inception that increases return on assets habit for in sources then serving the borrower at lower possible expenses and add the value of return on assets rather than grant finance that funding donation from NGOs and regional government and minimize cost per borrower that increases sustainability of FSS and OSS.
Key words: FSS, OSS, MFIs, Ethiopia

Introduction

Microfinance institutions have enabled millions of people in developing countries access formal financial services through microfinance programs. However, millions of potential clients still remain un-served and the demand for financial services far exceeds the currently available supply. Given significant capital constraints, expansion of microfinance programs remains a challenge facing the microfinance industry (Rai and Rai, 2012). Achieving financial sustainability is therefore critical for sustained programs independent of subsidies and for attraction of external funds. In developing countries, millions of poor people have availed microfinance and its growth has grabbed the attention of many stakeholders to measure the financial sustainability of such institutions (Beg, 2016). The financial services are provided to poor people that enhance the financial deepening in economy and in this way, financially deprived people become part of economy development. One of the major challenges faced by developing countries in pursuit of their social and economic development is poverty (Zeeshan et,.al 2017). In addition, the levels of significance of the factors of determinants of financial and operational sustainability of MFIs vary (Melkamu et al, 2012, Abebaw 2014, Sileshi 2015). The problem is particularly severe in developing countries, such as Ethiopia, mainly for two reasons.

First, most of the conventional banks in the country are concentrated in urban areas, while more than 80% of the population is rural. Second, whenever available, the formal banking sector systematically excludes the rural poor due to the

higher screening, monitoring, and enforcement costs of providing a small loan(Solomon et. al., 2019)

Statement of the Problem

Microfinance institutions play an important role in the financial system by providing financial services to those who cannot access the formal banking services. Nevertheless, millions of potential clients still remain un-served and the demand for financial services far exceeds the currently available supply (Bogan 2009).

According to Younus & Abed(2004) microfinance services have become a proven tool against poverty in mostly developing countries of the world including Bangladesh, India, Indonesia and South African sub-continents. It has also noted that microfinance programs do substantially better than control households in Bangladesh. Microfinance institutions (MFIs)target the poor through innovative approaches which include group lending, progressive lending, regular repayment schedules, and collateral substitutes (Mazlan et al., 2014).According to the Silashi Mirani(2015), has tried to see the determinants of financial and operational sustainability of MFIs in Ethiopia, by considering a number of more explanatory variables of FSS measures. Sisay (2016) have tried to sort out the driving factors of performance and sustainability of MFIs in Ethiopia. However, it give the impression to study determinants of Financial and operational sustainability of micro finance institutions in Ethiopia by increasing the number of variables based on the previous studies not include variables.

Objectives of the Study

General Objective

General objective of this study is to empirically examine and analyze the financial and operational determinants for the sustainability of microfinance institutions in Ethiopia. .

Specific Objectives

- To examine the financial self sufficiency of MFIs in Ethiopia using descriptive statistics.
- To examine the Operational self sufficiency of MFIs in Ethiopia using descriptive statistics.

- To identify factors that determine financial self sufficiency of MFIs.
- To identify factors that determine Operational self sufficiency of MFIs.

Hypothesis

Financial Self-Sufficiency

H1: There is a positive significant relationship between personnel productivity ratio with financial self-sufficiency

H2: There is a negative significant relationship between debt to equity ratio of financial self sufficiency

H3: Cost per borrower has a negative significant effect on the financial self-sufficiency

H4:. There is a negative significant relationship between inflation rate and financial self-sufficiency

H5: Grant to asset ratio of a microfinance institution is significantly and positively related to financial self-sufficiency

H6: There is a significant positive relationship between average loan balances per borrower to financial self-sufficiency.

H7: There is a negative significant relationship between operating expense ratio to financial self-sufficiency

H8: Adjusted Return on Asset has significant positive relationship with the operational self-sufficiency

H9: There is a significant negative relationship on the yield on gross loan portfolio of microfinance institutions and financial self-sufficiency

Operational Self-Sufficiency

H1: Adjusted Return on Asset has significant positive relationship with the operational self-sufficiency

H2: The Inception of MFI in Ethiopia has a positive significant effect on the operational self-sufficiency

H3: Debt to equity ratio of MFIs in Ethiopia has a negative significant effect on the operational self-sufficiency

H4: There is a negative significant relationship between inflation rate and financial self-sufficiency

H5: There is a significant negative relationship between average loan balances per borrower to financial self-sufficiency

H6: There is a positive significant relationship between personnel productivity ratio with financial self-sufficiency

H7: Operational expense ratio has positive significant effect on the operational self-sufficiency.

Significance and Relevance of the Study

As mentioned above, General objective of this study is to test the financial and operational determinants for the sustainability of microfinance institutions in Ethiopia. Hence microfinance helps in contributing a lot towards the overall development of the economy. In order to achieve this stated mission continually, MFIs themselves have to be sustainable both operationally and financially. The majority of Ethiopian population is poor and hence depends on MFIs as source of capital and general finance.

Methodology

Description of the Study Area

This study was carried out in Ethiopia located in the horn of Africa. Ethiopia is located at 3 degrees and 14.8 degrees latitude, 33 degrees and 48 degrees longitude in the Eastern part of Africa and situated between the Equator and the Tropic of Cancer. Ethiopia has great geographical diversity; its topographic features range from the highest peak at Ras Dashen, 4,550 meters above sea level, down to the Afar Depression, 110 meters below sea level (CSA, 2009)The climate varies with the topography, from as high as 47 degrees Celsius in the Afar Depression to as low as 10 degrees Celsius in the highlands. Ethiopia's total surface area is about 1.1 million square kilometers. Djibouti, Eritrea, the Republic of the Sudan, the Republic of the Southern Sudan, Kenya, and Somalia border of the country.

Ethiopia is one of the few African countries to have maintained its independence, even during the colonial era. Furthermore, the country is one of the founding members of the United Nations. Ethiopia takes an active role in African affairs, for example, playing a pioneering role in the formation of the Organization of African Unity (OAU). In fact, the capital city, Addis Ababa, has been a seat for the OAU since its establishment and continues to serve as the seat for the African Union. The country has nine regional states and two cities state divided according to the main ethnic lines such as Oromia regional state, Amhara regional state, Tigray regional state, Afar regional state, Benishangul-Gumuz regional state, Harari regional state, Somalia regional state, Southern Nation Nationalities and People regional state and Gambella regional state and cities state are Addis Ababa and Dire Dhawa with a total population of 108 million, (World bank, 2018)

Ethiopia in East Africa Ethiopia, Addis Ababa

Figure 1 Description of Study Area

The origins of Ethiopia's financial sector date back to 1990s. Ethiopia is a small open, rapidly growing economy with shallow financial sector and low coverage of financial services. In addition, there is a lack of more sophisticated financing mechanisms such as leasing, equity funds, etc. Based on different situations government Building sustainable financial institutions was accordingly considered by the government as a first priority for the microfinance industry. A next one was to build a genuine national microfinance industry. And, equally important, the old instrument of directed credit delivery was included in the regulation package. The government wanted MFIs to serve the rural subsistence farmers, as they represented the vast majority of the country's poor; microfinance had to play an important role in the national poverty reduction agenda. Existing service providers were required to cease all activities and apply for a

license under the new format. That regulation was clearly intended to create a new class of players may follow from the fact that the first four newly licensed MFIs were all regional government related, two of which were established well before new regulation became effective, and that it took erstwhile credit NGOs some time to transform into MFIs.

Sample and Sampling Technique

A sample is a subset of the population; it comprises some members selected from it. Orodho (2003) define a sample as part of the total population. Kothari (2014) describes a sample as a collection of units chosen from the universe to represent it. In order to ensure homogeneity of subjects used in a sample and for easy matching of data, the sample size for secondary data was determined by purposive sampling technique that researcher employed which is a non-probability approach (Rajendra, 1997). The researcher believes that collected data from each MFI is costly and time taking and hence, the sample size be judged based on the availability and quality of data and the resulting estimates. Accordingly, the researcher was selected fifteen MFIs from the total thirty four microfinance institutions based on having who consistently provide their Audited financial statements for eight years. By studying the sample one is able to draw conclusions that are generalized to the population of interest (Sekaran & Bougie, 2011).

Data Collection Techniques

The data type collected and utilized in the study was purely secondary data based on the annual reports of the MFIs from AMFIs in Ethiopia where all microfinance institutions disclose their financial information through AMFI web portal.

The data for the study was drawn from a database of audited financial statements of MFIs in Ethiopia. The data was collected from the financial statements include capital structure variables which include debt, equity, total assets, etc. The data was captured by reviewing Audited financial statements of listed MFIs from the report of National Bank of Ethiopia (NBE). The data collected for both the dependent and independent variables was adjusted ratios and averages derived from the MFIs financial statements.

2.4 Sampling Frame

Cooper (2011) also refers a sampling frame as a source list containing all names of the universe. The sampling frame of this study was the Association of which regulates all MFIs in Ethiopia. A list of all the thirty four Microfinance Institutions obtained from the Association of Microfinance Institution.

Method of Data Analysis

Based on Zikmund (2010) researcher data analysis refers to the application of reasoning to understand the data that has been gathered with the aim of determining consistent patterns and summarizing the relevant details revealed in the investigation. A multiple regression model was used to analyze (regress and interpret) the data collected from MFIs and the outputs were obtained from SPSS Version 24.0 and STATA 13.0 Version econometrics software.

Model Specification

In addition to using a descriptive statistics, the researcher was taken two separate multiple regression models to analyze the sustainability of MFIs in Ethiopia. Many econometricians argued that one of the most useful aspects of a multiple regression model is its ability to identify the independent effects of a set of variables on a dependent variable.

$$FSSit = \beta + \beta 1PPR + \beta 2GARit + \beta 3CPBit + \beta 4DERit + \beta 5ROAit + \beta 6OERit + \beta 7INFit + \beta 8AKBPB + \beta 9Yieldit + \varepsilon it$$

Where FSS it is the observed financial self-sufficiency of an MFI i at year t,
$5\emptyset\acute{y}\text{Þ}0$ is the constant term showing the value of FSS, when all the coefficient of the independent variables are zero,
PPR it is personal productivity ratio of an MFI i at time t,
ROA it is the return on asset ratio of an MFI i at time t,

CPB it is the cost per borrower of an MFI i at time t,

DER it is the debt to equity ratio of an MFI i at time t

GAR it is the grant asset ratio of an MFI I at time t,

INF it is the rate of inflation of Ethiopia assigned to an MFI i at time t, and

ALBPB it is the average Loan Balance per Borrowers of an MFI i at time t,

OER it is the Operating Expense Ratio of an MFI i at time t,

YIELD it is the Yield on Gross loan Portfolio of an MFI i at time t,

âs are the partial effect of independent variables in period t.

5Øß5ØVÜ5ØaÜ is the error term of an MFI i at time t.

$$OSSit = \beta 0 + \beta 1 RoAit + \beta 2 ALBPBit + \beta 3 DERt + \beta 4 INFRit + \beta 5 OERit + \beta 6 Ln(INCEP)it + \beta 7 PPRit + \beta 8 GARit + \beta 9 Log(yield)it + \beta it\beta$$

Where

OSS it is the operational self-sufficiency ratio (dependent variable) of an MFI i at period t,

$\beta 0$ is a constant term; â1-n measures the partial effect of independent or explanatory variables 1-n for period *t,*

ALBPB it is the average Loan Balance per Borrowers of an MFI i at time t,

DER it is the debt to equity ratio of an MFI i at time t

GAR it is the grant asset ratio of an MFI I at time t,

INCEP it is the Inception of MFI i at time t

INF it is the rate of inflation of Ethiopia assigned to an MFI i at time t, and

OER it is the gross loan portfolio of an MFI i at time t,

PPR it is personal productivity ratio of an MFI i at time t,

ROA it is the return on asset ratio of an MFI i at time t,

YIELD it is the Yield on Gross loan Portfolio of an MFI i at time t,

εit is the error term

3. Results and Discussion

Descriptive Analysis

Table 1: Descriptive Statistics of Explained Variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness Statistic	Std. Error
FSS	120	-.33	.98	.3055	.25351	.526	.221
OSS	120	-.22	3.66	1.424	.62514	1.371	.221
Valid N (listwise)	120						

Source: SPSS Version 24.0 Results, 2019
According to the analysis of descriptive **statistic from the above table 1** showed that the mean values, maximum values, minimum values and standard deviations MFIs' FSS observations are 0.3055, 0.98, -0.33 and 0.25351 respectively. The me**an of FSS as indicated in table 1** is 0.3055 and it implies financial not sustainability based on the given the international requirement of an FSS ratio of 1(Sileshi.M 2015 and Sisay.H 2016), of MFIs in Ethiopia. Comparison in Sub-Saharan Africa (SSA) such as Kenya, Nigeria and Ghana Countries are had higher mean scores of an FSS ratio that indicated MFIs operating in than Ethiopian and they are said to be more sustainable than Ethiopian MFIs.

Table **2** Descriptive Statistics of Explanatory variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness Std. Error	Statistic
GAR	120	-.02	7.43	2.2303	3.11842	.729	.221
DER	120	.02	.98	.3238	.35329	.750	.221
OER	120	.39	.98	.7299	.13955	-.204	.221
ROA	120	-.08	.22	.0482	.05179	.755	.221
PPR	120	-.01	.94	.1958	.30204	1.397	.221
CPB	120	-.02	.94	.2059	.29728	1.381	.221
INFR	120	.07	.33	.1425	.08837	1.189	.221
ALBPB	120	-.08	.94	.2184	.29176	1.357	.221
Yield(log)	120	.70	.77	.7411	.02411	-.283	.221
INCEPa	120	.00	7.43	5.0787	1.66138	-1.139	.221
Valid N (listwise)	120						

From the above table 4: In regard with grant to asset ratio the mean score shows 2.2303 from the period of 2011 to 2018. This result indicates financial self-sufficient was maintained donated equity of in its total assets. MFIs are relatively financed more by denoted equity rather than commercial sources that become depend on and may a risk if unexpected situation occurs.

Debt to equity ratio the mean score shows 0.3238 from the period of 2011 to 2018. The descriptive statistics result also shows minimum and maximum value of 0.02 and 0.98 respectively. This indicating the debt financing is more considered instead of having proportional financing structure, therefore highly leveraged. Debt to equity ratio is the simplest and best known measure of capital adequacy because it measures the overall leverage (operating, Financial and mixed leverages) of the institution (AEMFI, 2016). Operating expenses ratio mean score shows 0.7299 from the period. The descriptive statistics result also shows minimum and maximum value of 0.39and 0.98 respectively. This indicates that 0.7299 by these units incurring the operating expense for each dollar in the gross loan portfolio.

Cost per borrower mean score shows 0.2059 from the period. The descriptive statistics result also shows minimum and maximum value of -0.02 and 0.94 respectively that describes running microfinance institutions by losses or operation that depend on their situations of tasks in mfis .

Operating expense ratio is the most commonly used efficiency indicator for MFIs that includes all administrative and personnel expense. MFIs that provide smaller loans will compare unfavorably to others, even though they may be serving their target market efficiently.

Return on assets mean score shows that 0.0482 for the period. The descriptive statistics result also shows minimum and maximum value of -0.08 and 0.22 respectively that describes running microfinance institutions by losses or operation that depends on their capacity level. This indicates that 0.0482 units invested on the one unit off. Return on asset measures how well the institution uses all its assets and it is also an overall measure of profitability reflecting both the profit margin and the efficiency of the institutions.

Generally, it can be said that, from explanatory variables of microfinance, Grant Asset ratio,

inception and debt-to-equity ratio have the highest standard deviation of 3.11842, 1.66138 and 0.35329 respectively as compared with other explanatory variables. This indicates that these variables have more significant variance than other explanatory variables considered in the study.

Correlation Analysis

A correlation matrix is used to ensure the correlation between explanatory variables. Cooper & Schindler, (2009) suggest that a correlation coefficient above 0.8 between explanatory variables should be correlated because it is a sign for multi-co linearity problem, as quoted by Sisay (2016). As noted in Brooks (2008), Correlation between two variables measures the degree of linear association between them. The study used product moment of correlation coefficient to look the association of the dependent variable Financial self sufficiency and Operational self sufficiency and independent variables (Grant Asset ratio, Debt to equity ratio, Operating expenses ratio, Return on assets, Personnel productivity ratio, Inflation, Average loan balances per borrower, Yield on Gross loan Portfolio, and Inception(size)

Regression Analysis

The relationship between the independent and dependent variable was established using regression models. The model for FSS and OSS,

based on the result, has been tested for the assumptions of the classical linear regression model (CLRM) before interpreting the result.

Model Diagnostic Test Assumption for both FSS and OSS

Diagnostic checking is done to test of four basic assumptions of CLRM model those are Heteroskedasticity, Test of Autocorrelation, Test for Normality, and Multicollinearity shows the diagnostics are free from any biased any assumptions.

Findings from Financial Self-Sufficiency (FSS) regression model

Based on the following table, cost per borrower and Inflation have statistically negative relationship with financial self-sufficiency of microfinance institutions. On the other hand, Grant Asset ratio, Return on assets and Personnel productivity ratio have statistically positive relationship with financial self-sufficiency.

Generally, these exogenous variables together are good explanatory variables of the FSS of microfinance institutions in Ethiopia. Though this, F-statistics which was used to measure the overall test of significance of the model was presented, and null hypothesis can be clearly rejected in both of the two regression models. Since the p-value is 0.000000, which is sufficiently lower, the model is well fitted at 1 percent level of significance.

Table 3 Regression results for the determinants of financial self-sufficiency

Source: STATA 13.0 Results, 2019

The model regression of this study can be written According to the output:

FSS = 0.1269619 + 0.018773ALBPB + 0.159889GAR -0.166767CPB + 0.5895199PPR + 2.625534ROA - 0.378302OER - 0.4208784INF + 0.0226963Yield

Based on the regression output the following exogenous variables like personnel productivity ratio, cost per borrower, Grant Asset ratio, Operating expenses ratio, Inflation, Return on assets are significant at 5% and reject null hypothesis that indicate variables are notstatistically significant effect on financial self-sufficiency and sustainability of MFIs.

Regression result and findings of OSS model

In order to examine the relationship between dependent variable, OSS indicator of microfinance institution, and explanatory variables, that regression analyses were run on independent model. The study found out that the estimated result of Random effect model analysis is at a fairly satisfactory level. This is evidenced by the fact that the R-squared is 57% of endogenous variables that are explained by independent variables of the MFIs while the remaining 43 %, of the change in OSS regression model is explained by other factors which are not included in the regression line.

Table 1 The regression result for OSS model

oss	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
roa	2.642634	.3786094	6.98	0.000	1.900573	3.384694
albpb	.0229691	.0125651	1.83	0.068	-.0016581	.0475964
der	-.1084395	.0637491	-1.70	0.089	-.2333854	.0165064
infr	-.3278858	.1842129				
oer	-.1824365	.067331				
incepln	-.3011404	.0704874	-4.27	0.000	-.4392932	-.1629875
ppr	.9288196	.2834327				
gar	.2183823	.0714974			.07825	.3585147
yieldlog	.0333587	.0114941	2.90	0.004	.0108307	.0558867
_cons	-.0631473	.0857971	-0.74	0.462	-.2313066	.105012
sigma_u	.01951901					
sigma_e	.16633886					
rho	.01358279	(fraction of variance due to u_i)				

$$OSS_{it} = \beta_0 + \beta_1 RoA_{it} + \beta_2 ALBPB_{it} + \beta_3 DER_t + \beta_4 INFR_{it} + \beta_5 OER_{it} + \beta_6 Ln(INCEP)_{it} + \beta_7 PPR_{it} + \beta_8 GAR_{it} + \beta_9 Log(yield)_{it} + \beta_{it}$$

Source: STATA 13.0 Results, 2019

Therefore, based on the regression result from the study, we reject the null hypothesis which was formulated to show the absence of a significant relationship between ROA, OER, Incep, PPR, GAR and Yield affect operational self-sufficiency of Ethiopian microfinance institutions.

Based on the framed model estimation of Operational sustainability of Ethiopian MFIs are presented below.

The model regression of this study can be written According to the output:

OSSit= -0.0631473+ 2.642634ROA + 0.0229691ALBPB - 0.1084395DER - 0.3278858INFR - 0.1824365OER- 0.3011404LnINCEP+ 0.9288196PPR + 0.2183823GAR+ 0.0333587LogYield

Conclusion

This study tried to analyze the determinants of Financial and operational sustainability of micro finance institutions in Ethiopia, with a data set covering eight years period from 2011 to 2018. The study made use of secondary data in analyzing and interpreting the effect of the determinants of Financial and operational sustainability of micro finance institutions in Ethiopia. The secondary data was obtained basically from audited financial statements of selected MFIs and supplementary data were also collected from Association of Ethiopian Microfinance (AEMFI).

Based on period covered by this study, Ethiopian MFIs scored an average of Financial Self-Sufficiency ratio implies MFIs are financially not sustainability based on the given the international requirement of an FSS ratio of 1(Sileshi 2015), (Bek 2016), (Zeeshaan, et,al 2017), means that it is difficult for MFIs to cover all costs and their obligations without ongoing funding donation or government funding. Therefore from this research microfinance institutions in Ethiopia are not financially sustainable but operationally sustainable. Exogenous variables like grant asset ratio, operating expense ratio, yield gross loan portfolio, and inception are highly positive mean value on the determinants of Financial and operational sustainability of micro finance institutions in Ethiopia. The Adjusted R-Square is 0.55 and 0.57 for model FSS and model OSS respectively, which tells the percentage of variation explained by only the exogenous variables and while the remaining 45% of FSS and 43 %, of the change in OSS regression model is explained by other factors which are not included in the regression line.

Recommendations

The ability of a MFI to cover its operating and other costs from generated revenue and provide for profit. It is a needle which shows how the MFI can run free of funding. This is to mean that, earning from interest should be enough to cover operating costs, loan losses and interest and adjustment expenses. long term sustainability requires MFIs to manage delinquency, having their grant donation (may be from regional government or NGOs) and reduce their cost per borrowers, operating expenses ratio, increase their yield gross loan portfolio, return on assets by doing so, they have to set interest rates to cover all these costs that to touch poor people at all in the country and that was the guarantees of MFIs Sustainability of long life properly.

The study recommends for policy considerations of the successful and effective operation of microfinance programs through simplify of distribution of improve yield on gross loan portfolio, personnel productivity and reduces of borrowing fund from the donors(grant asset ratio), reducing operating expenses ratio, to generate financial revenue and focus on the increase of value of their total assets in Ethiopia.

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