Determinants of Financial Sustainability of Microfinance Institutions in Ethiopia

Kaldir Hasan Odowa* and Liaqat Ali**

* School of Management Studies, Punjabi University, Patiala-147002

* School of Management Studies, Punjabi University, Patiala-147002

Abstract

This research examines the determinants of financial sustainability of MFIs in Ethiopia. The study used a panel data regression model using data for 20 microfinance institutions for the period 2009- 2016 containing 155 observations. Results indicate that MFIs' operational self-sufficiency is positively and significantly affected by the average loan balance per borrower and the size of the MFIs. Also, financial self-sufficiency is positively and significantly influenced by size & age of MFIs. Besides, cost per borrower had a negative and significant impact on both operational self-sufficiency as well as financial self-sufficiency, however, portfolio at risk (PaR) > 30 days has a negative and significant influence on financial self-sufficiency only.

Key Words

Microfinance, Institutions, Sustainability, Self-sufficiency, Ethiopia.

INTRODUCTION

Financial markets play a vital role in the productivity and development of the economy. However, running banks in poor societies is difficult. As per Besley (1995), credit markets with potential customers who don't have enough assets as collateral are undermined by information asymmetries. The logical reasons for not providing financial service to the poor clients are the problem of adverse selection and information asymmetry which is substantially more severe in case of these customers (Dokulilova *et al.*, 2009). Microfinance has evolved as an economic development approach intended to benefit low-income people

and refers to the provision of financial services to low-income clients, including the self-employed. According to Ethiopian Proclamation No. 626/2009, micro-financing business is the provision of financial services like accepting savings, extend credit, drawing and accepting drafts payable, providing money transfer services and others specified in the Article 3(2) of the proclamation. The core objective of microfinance is not only providing financial intermediation to the low income group and poor individuals, but MFIs also provides social intermediation services such as group formation, development of self-confidence, and training in financial literacy and management capabilities among members of a group (Ledgerwood, 1999). Although the ownership forms have varying degrees of ability to achieve the dual objectives of microfinance (outreach to poor and financial sustainability), there are many forms of microfinance institutions, ranging from social venture capital to private credit unions, financial cooperatives, specialized or non-bank microfinance institutions, non-government organizations, saving groups, and village banks (Zeller and Johannsen, 2006; Gaul, 2011). Microfinance has evolved as an economic development approach intended to benefit low-income people and refers to the provision of financial services to low-income clients, including the self-employed. Microfinance is the delivery of a broad range of financial services to poor and low-income households and their micro-enterprises (Asian Development Bank [ADB], 2000). It provides financial services such as deposits, loans, payment services, money transfers, and insurance (ADB, 2000). The concept of providing financial services to low-income people is not a recent development. Many informal credit groups have been operating in many countries for years, some of them are following; The West African "Susu", an indigenous form of credit and savings association (Atingdui, 1995).Chit funds and Rotating Savings and Credit Associations (ROSCAs) in India, tontines in West Africa, Pasanakuin Bolivia, Huiin China, Arisanin Indonesia, Paluwaganin Philippines, etc. Though microfinance has existed for centuries in various forms, the development of distinct MFIs attained prominence in the 1980s after the emergence of the Grameen Bank, which developed strategies and lending techniques that influenced microfinance organizations all over the world. Initially, microfinance used "social capital" to overcome the lack of collateral and limited information on credit worthiness that had hindered the extension of financial services to poor populations (Robinson, 2001). Moreover, this credit program has become a model for most of the low-income countries who are actively engaged in the process of eradicating poverty from their soil. In this regard, a country like Ethiopia has been pursuing this new model of microfinance over the last decade to eradicate poverty. Though

microfinance operations have seen considerable growth in recent years (Demirguc-Kunt & Klapper, 2012), potential market of such activity is still below the actual needs to finance small projects and people under financial necessity. Consequently, the initial objective of these financial institutions which is the outreach is not well-achieved (Honohan, 2004). MFIs were mainly initiated with a mission of poverty reduction. Yet, in recent decades, there is a shift of MFIs focusing on the social objective to the economic objective of sustainable and market-based financial services. In the 1990s, the importance of the financial sustainability of MFIs originated an imperative debate between the financial systems approach and the poverty lending approach (Robinson, 2001). The latter emphasizes lending to the poorest of the poor, while the financial systems approach focuses on lending to the creditworthy among the economically active poor people with the ability to use small loans and the willingness to repay them and on voluntary savings mobilization (Robinson, 2001).However, most of the MFIs are facing a major problem of attaining sustainability (Shcreiner, 2000). Therefore, analyzing determinants of financial sustainability of MFIs is necessary to address maintaining the sustainability of MFIs, so that they would be able to reach more disadvantaged society in a financially sustainable way. This study aims to examine and provide an in-depth analysis of the determinants of financial sustainability of MFIs in Ethiopia. For the purpose of analysis, data for 20 MFIs over the period 2009–2016 in Ethiopia have been used.

LITERATURE REVIEW

In the long run, few retail providers can maintain and expand the financial services they offer unless they can cover all of their costs and generate net income (Rosenberg, 2009). Performance measure in MFIs has been given proper attention due to their double bottom line operation and their reliance on an external source of funds in the form of subsidy. Also, the traditional accounting performance measures that have been used for purely commercial undertaking may not be appropriate because they give an unrealistic picture for MFIs. Different authors suggest different criteria to evaluate the performance of microfinance institutions. Meyer and Zeller (2002) suggested the so-called "critical micro-finance triangle" outreach to the poor, financial sustainability and welfare impact. As per the critical microfinance triangle model, MFI should be financially sustainable, outreach the poorest people in the target area and should have a positive and sustainable impact on the livelihoods of these people. Financial performance analysis is used to measure a firm's overall

financial health over a given period of time, also, it can be used to compare similar firms across the same industry, etc. Financial viability helps an MFI in better resource mobilization (Schreiner, 1996). Sustainability is the ability of microfinance institutions to cover their operating and other costs from generated revenue, provide for profit and operate without external help or donation. According to Meyer (2002), there are two levels of financial sustainability : operational self-sustainability and financial self-sustainability. Operational self-sufficiency(OSS) measures how well an MFI can cover its costs through operating revenues, while, financial self-sufficiency(FSS) measures how well an MFI can cover its costs taking into account adjustments to operating revenues and expenses (Bruett *et al.*, 2005).OSS is the most basic measurement of sustainability, indicating whether revenues from the operations are sufficient to cover all operating expenses; it emphases on revenues and expenses from the microfinance institution's core business, excluding non-operating revenues and donations (Bruett *et al.*, 2005). Financial expense & impairment losses on loans are included in this calculation because they are normal costs of operating. By concentrating on cost coverage, OSS reflects the MFI's ability to continue its operations if it receives no further subsidies. The breakeven point of an MFI's operations is 100 per cent. Young MFIs may take several years to break even, and when they do, they should never return to an OSS of less than 100 per cent (Bruett *et al.*, 2005).

As aforementioned, operational self-sustainability and financial self-sustainability are two levels of financial sustainability (Foster *et al.*, 2003). Financial self-sustainability is achieved when the organization not only earns sufficient income to cover all its operating expenses but also covers the cost of inflation, its loan losses and the market cost of funds. According to the Bruett *et al.* (2005), the difference between OSS and FSS is that FSS measures not only an MFI's ability to cover its operating costs but also its ability to maintain the value of its equity relative to inflation and to operate and expand without subsidies.

Determinants of Financial Sustainability of MFIs

At a global level, Ayi & Maty (2010) studied what drives MFI's financial sustainability, using microfinance institutions in 101 countries scattered by region and type of microfinance institutions over the period of 1998-2006. The study revealed that a high-quality credit portfolio, coupled with the application of

sufficiently high interest-rates that allow a sensible profit and sound management are instrumental to the financial sustainability of microfinance institutions. The results reveal that percentage of women borrowers has an insignificant negative impact on the sustainability of MFIs. Finally, the results of the study noted the client outreach of microfinance programs and the age of MFIs have a positive but smaller impact on the financial sustainability of MFIs.

Rai & Rai (2012) carried out a study on factors affecting the financial sustainability of MFIs. The authors used data from MFIs in India and Bangladesh. Result of the study revealed the factors that affect the sustainability of MFIs are capital to asset ratio, operating expenses to loan portfolio and portfolio at risk greater than 30 days.

Employing a quantitative research approach, Mahapatra & Dutta (2016) studied determinants of sustainability of the microfinance sector in India. The study deployed probit regression model as a data analysis technique using 9 years' secondary data of 65 selected MFIs in India gathered from the mix-market database. The study highlighted that the size of a microfinance institution, average loan balance per borrower, cost per borrower & yield on gross loan portfolio affect the operational sustainability of Indian microfinance institutions in a significant manner.

Beg (2016) studied the determinants of financial self-sufficiency of Andhra Pradesh MFIs, the study used panel data from mix-market of ten MFIs of Andhra Pradesh, over the period 2005 to 2013 and found that yield on gross loan portfolio, size, portfolio at risk (30) days and age are determinants of financial self-sustainability. Furthermore, the study revealed that average loan balance per borrower, labor cost to assets ratio, capital cost to assets ratio & gross loan portfolio to total assets ratio are statistically insignificant predictors of financial self-sufficiency.

De Crombrugghe *et al.* (2008) carried out a study on the performance analysis for a sample of microfinance institutions in India. The study employed a regression analysis technique to study the determinants of the self-sustainability of MFIs in India. Cost coverage by revenue, repayment of loans and cost-control are three aspects of sustainability that were particularly investigated by the study. The study argued that without necessarily raising the size of the loans or increasing the monitoring cost, the challenge of covering costs on small and partly unsecured loans can indeed be met.

Using a quantitative research approach, Nyamsogoro (2010) studied the financial sustainability of rural microfinance institutions (MFIs) in Tanzania. The

author employed a panel data regression model using 4 years of primary and secondary data gathered from 98 sampled rural MFIs in Tanzania. The study noted that microfinance capital structure, interest rates, lending type difference, cost per borrower, product type, size of microfinance institutions, number of borrowers, yield on gross loan portfolio, portfolio at risk level, level of liquidity, productivity of the staff, and the operating efficiency affect the financial sustainability of rural MFIs in Tanzania.

Nyanzu, Peprah and Ayayi (2018) examined the impact of regulation on MFIs' sustainability and social outreach in sub-saharan Africa. The study used unbalanced panel data over 2002 - 2012 for 30 countries, also it deployed a multilevel estimation technique, the result revealed that regulation supports advance the sustainability and breadth of outreach, however, it does not affect the depth of outreach. Moreover, the study found that microfinance institutions that are deposit-taking have better sustainability, however, tend to serve the marginal poors. Also, regulatory quality has a positive influence on sustainability and outreach.

Awaworyi (2017) examined the sustainability and depth of outreach of MFIs in sub-Saharan Africa, employing data obtained from 206 microfinance institutions in 33 African countries, the study deployed three?stage least square technique to analyze whether a trade?off exists between sustainability and depth of outreach. The results revealed the existence of a trade-off.

Luka (2017) studied the determinants of sustainability and outreach of microfinance institutions in Uganda. The study employed an econometric approach using a panel data. The research used 6 years' data gathered from 53 microfinance institutions in Uganda. The study found that sustainability is positively & significantly determined by real effective lending rates and age of a microfinance institutions, and negatively by the ratio of gross outstanding loan portfolio to total assets, the ratio of average loan size to national per capita income, the unit cost of loans disbursed, and a group-based delivery mechanism compared to an individual-based delivery mechanism.

To conclude, the review of literature of the determinants of financial sustainability of microfinance institutions carried out by different scholars in different countries reveal that portfolio quality, age, capital to asset ratio, efficiency & productivity, and outreach of the institutions are contributing factors of MFIs financial sustainability. Besides, studies noted the existence of a trade?off between sustainability and depth of outreach. This research investigates the determinants of financial sustainability of MFIs in Ethiopian context.

OBECTIVES OF THE STUDY

The study has the following specific objectives :

- To determine the factors affecting operational self-sufficiency of MFIs in Ethiopia.
- To identify the factors affecting financial self-sufficiency of MFIs in Ethiopia.

DATA

This study used secondary data obtained from all MFIs in Ethiopia which are members of AEMFI and reporting their performance to the Association of Ethiopian Microfinance Institutions (AEMFI). AEMFI is a not-for profit, non-governmental association of the Ethiopian microfinance institutions. Its original goal is to serve as a platform for knowledge and information sharing, and lobby for political support for the development of an enabling environment for the business of microfinance in Ethiopia. This research comprises 20 MFIs operating in Ethiopia whose performance report was produced under AEMFI for the period 2009-2016.

METHODOLOGY

The variables of the study are shown in Table 1, including the list of dependent as well as independent variables. This research used operational self-sufficiency (OSS) and financial self-sufficiency (FSS) as financial sustainability indicators, i.e., dependent variables. Besides, average loan balance per borrower, percentage of women borrowers, cost per borrower, and borrowers per loan officer, debt to equity ratio and age and size of MFIs are considered as the independent variables of the study. This relationship is established through following estimation equations :

$$OSS_{it} = \alpha_{it} + \beta_1 AVLB_{it} + \beta_2 Size_{it} + \beta_3 CPB_{it} + \beta_4 PaR > 30\ days_{it} + \beta_5 DER_{it} + \beta_6 \%WM_{it} + \beta_7 BPLO_{it} + \beta_8 AGE_{it} + \varepsilon_{it}... (1)$$

$$FSS_{it} = \alpha_{it} + \beta_1 AVLB_{it} + \beta_2 Size_{it} + \beta_3 CPB_{it} + \beta_4 PaR > 30\ days_{it} + \beta_5 DER_{it} + \beta_6 \%WM_{it} + \beta_7 BPLO_{it} + \beta_8 AGE_{it} + \varepsilon_{it}... (2)$$

This section displays the results of descriptive statistics, correlation analysis of explanatory variables, normality test result, unit root test, variance inflation factor and panel data regression model results along with a discussion of the study.

Table 1
Dependent and Independent Variables

	Variables	Measurement
Dependent Variables	Operational Self-sufficiency (OSS)	OSS = Financial revenue/(Financial Expense + Impairment Losses on Loans + Operating Expense)
	Financial Self-sufficiency (FSS)	FSS = Adjusted Financial Revenue/Adjusted (Financial Expense + Net Loan Loss Provision Expense + Operating Expense)
Independent Variables	Average Loan Balance per Borrower (AVLB)	AVLB = Adjusted Gross Loan Portfolio / Adjusted Number of Active Borrowers
	Percentage of Women Borrowers (%WB)	Number of Active Borrowers / Adjusted Number of Active Borrowers
	Cost per Borrowers (CPB)	CPB = Adjusted Operating Expense/Adjusted Average Number of Active Borrowers
	Borrowers per Loan Officer (BPLO)	Adjusted Number of Active Borrowers / Number of Loan Officers
	Portfolio at Risk Greater Than 30 Days (PaR > 30 Days)	PaR = Outstanding Balance, Loans Overdue 30 Days / Adjusted Gross Loan Portfolio
	Debt to Equity Ratio (DER)	Adjusted Total Liabilities / Adjusted Total Equity
	Age of MFI	Years of Functioning as an MFI
	Size of MFI	SIZE = Log Total Assets of MFI

Descriptive Statistics of MFIs

This section demonstrates the descriptive statistics of the study variables included in the analysis pertaining to the factors affecting the financial sustainability of MFIs in Ethiopia. Thus, the minimum and maximum values, mean and standard deviation of both dependent variables (OSS and FSS) and independent variables (AVLB, DER, PaR >30days, CPB, %WB, BPLO, and Size & age of MFIs) are presented in this section.

From Table 2, the mean of OSS is 131 per cent showing on an average, Ethiopian MFIs are operationally sustainable. The minimum value of OSS is 0.08 which displays the non sustainability of microfinance institutions. The maximum value of the variable is 244 per cent which reveals the higher sustainability of

Table 2
Descriptive Statistics for Variables

Variables	N	Mean	Minimum	Maximum	Std. Dev.
OSS	155	1.311484	.08	2.44	.4213673
FSS	155	.9136129	.04	1.76	.3232664
AVLB	155	2503.561	553	8202	1597.83
DER	155	1.944839	.22	11.15	1.461923
Par>30days	155	.0748387	0	.82	.09922
CPB	155	286.9503	36	1418	247.8328
%WB	155	.5002581	.1	.96	.2015104
BPLO	155	460	72	1712	252.1724
Size	155	544,948,488.70	629,545.00	8,460,216,309.00	1,202,125,518.26
Age	155	10.61	2	17	3.4

microfinance institutions. The depth of outreach is represented by average loan size (Joanna, 2000). Loan size is commonly used as depth of outreach proxy, small amounts, shorter times, and more instalments imply greater depth (Schreiner, 2002). Based on Table 2, the average social outreach of the MFIs is indicated as average loan balance of 2503. The minimum value for AVLB is reported 553 with a maximum value of 8202, whereby the standard deviation of AVLB is indicated as 1597, which means that AVLB value deviates from the mean of both sides by 1597.

The average debt to equity ratio (DER) of the sampled MFIs is 190 per cent. The minimum value for DER is reported 0.22 with a maximum value of 11.15, whereby the standard deviation of DER is indicated as 1.46, which means that DER value deviates from the mean of both sides by 1.46. Average assets for the microfinance industry as a total were found to be ETB 544,948,488.70. The minimum value for the asset is reported 629,545.00 with a maximum value of 8,460,216,309.00. BPLO indicate the ability of the loan officer to attend the number of borrowers efficiently. If this ratio will increase, salary cost may appear lower. It increases the efficiency of MFIs. As shown in Table 2, the mean value of BPLO of Ethiopian microfinance institutions is 460. Minimum value shows that some officers have only 72 numbers of borrowers. This shows that some Ethiopian microfinance institution officers are having very low potential. The maximum value of borrowers per loan officer is 1712, it indicates some MFI officers are performing better in their potential. Cost per client is a better efficiency ratio for comparing institutions (Rosenberg, 2009). Based on Table 2,

the sampled MFIs' average cost per borrower is 286.The minimum value of cost per borrower is 36 which show that some MFIs are efficient in decreasing their CPB. The maximum value of CPB is 1418 which displays the inefficiency of some MFIs, it indicates the cost per borrower is very high in some microfinance institutions.

In relation to the percentage of women borrowers, the average percentage of women borrowers is 50%, which means 50% of the MFIs clients are women. The study revealed that access to credit by women is good. The minimum value shows that MFI has only 1 per cent of women of borrowers. This shows that some Ethiopian MFIs are not servicing enough to women borrowers. The maximum value of women borrowers is 96 per cent, it indicates some MFI are serving more women borrowers.

Portfolio at risk (PaR) measures the portion of the loan portfolio "contaminated" by arrears as a percentage of the total portfolio (von Stauffenberg *et al.*, 2003). The mean value of PaR> 30 days shows that a 7.48 per cent loan is outstanding in microfinance industry. The higher ratio indicates that MFI is not able to recover the amount of loan. The minimum value of PaR> 30 days is 0 which shows that some MFIs are able to recover the full amount of loan portfolio. Whereas the maximum value of the portfolio at risk is 82% which specifies that some MFIs are not able to recover any amount of loan portfolio.

Normality Test

There are several tests of normality in the literature, one of those tests is the Jarque-Bera test. According to Gujarati (2004), Jarque–Bera test of normality is an asymptotic test. It is also based on the OLS residuals (Gujarati, 2004). This study used Jarque-Bera test for dealing with normality of the data, as per Table 3, the results of Jarque-Bera test reveal with the null hypothesis that the residuals are normally distributed, the Jarque-Bera test statistics supported the hypothesis that the residuals are normally distributed since the p-value is higher than the significant level of 5%.

Table 3
Skewness-Kurtosis (Jarque-Bera) Test Results

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Adj Chi²	Prob> Chi²
FSS Residuals	146	0.8980	0.6211	0.26	0.8778
OSS Residuals	146	0.3121	0.1927	2.76	0.2510

Unit Root Test

Panel data have the dimensions of both time series and cross-sections, and checking whether a series is stationary or not is very essential. According tobrook (2014), determining whether a series is stationary or not is very important, for the stationarity or otherwise of a series can strongly influence its behavior and properties. Thus, Levin, Lin and Chu unit root test has been employed on the panel data for checking stationarity of the data and as per Table 4, the results reveal that value of t-statistics is significant for all the data series, which shows there is no unit root in all the data series (stationarity of data series).

Table 4
Unit Root Test for Variables

Variables	Levin, Lin and Chu t-Statistic	p-Value
Operational Self-sufficiency	-8.3296	0.0000
Financial Self-sufficiency	-28.5908	0.0000
Average Loan Balance	-5.4481	0.0000
Percentage of Women	-6.0896	0.0000
Cost per Porrower	-12.4920	0.0000
Borrower per Loan Officer	-6.0803	0.0000
Portfolio at Risk Greater Than 30 days	-21.9433	0.0000

Pearson's Correlation Analysis

Pearson's correlation analysis was conducted to determine the relationship between the explanatory variables in both models (Equation I and II); it allows the detection of any problem of multicollinearity. The problem may arise if the correlation value exceeds a certain limit that is 0.80 (Kennedy, 2008). The correlation analysis test results in Table 5 indicate a low degree of correlation between independent variables.

Table 5

Pairwise Correlation Between Explanatory Variables

Variables	AVLB	Size	CPB	PaR>30 days	DER	% WB	BPLO	Age
AVLB	1.0000							
Size	0.4762	1.0000						
CPB	0.3452	-0.4528	1.0000					
Par>30 days	-0.1734	-0.2765	0.0593	1.0000				
DER	0.1978	0.4572	-0.2566	0.0276	1.0000			
% WB	-0.2657	-0.2549	0.0621	-0.3224	-0.4285	1.0000		
BPLO	-0.0855	0.4525	-0.4828	0.1399	0.3067	-0.2808	1.0000	
Age	0.4851	0.6134	0.0893	-0.0915	0.3028	-0.1048	0.2665	1.0000

The authors further computed the variance inflation factor (VIF) for each coefficient as a diagnostic statistics test to show how serious is the multicollinearity problem. The following Table 6 shows the VIF for all the independent variables.

Table 6

Variance Inflation Factor (VIF) Test Results

Variable	VIF	1/VIF
Size	6.04	0.165482
CPB	3.44	0.290333
AVLP	2.97	0.339784
Age	2.51	0.398908
BPLO	1.73	0.577458
% WB	1.68	0.595662
DER	1.52	0.657864
Par>days	1.48	0.675823
Mean VIF	2.67	

Determinants of Financial Sustainability of MFIs in Ethiopia

For the first equation, the authors estimated the random effect model, while the authors' estimated fixed effect for the second model or second equation. This choice is supported by a Hausman test with the null hypothesis

of the efficiency of random effects. The estimates of the panel data are given in Table 7.

Table 7
Determinants of Sustainability of MFIs in Ethiopia

Independent Variables		Dependent Variables	
		OSS **(re)**	**FSS** **(fe)**
	Log(AVLB)	.1302184 (0.062)	-.0305258 (0.732)
	Size	.1106634 (0.001)	.1426959 (0.029)
	Log(CPB)	-.1034445 (0.046)	-.2213119 (0.000)
	Log(PAR)	-.0760699 (0.010)	-.0089098 (0.779)
	Log(DER)	-.0389241 (0.358)	-.0605492 (0.181)
	Log(%WB)	.0403164 (0.632)	.1105974 (0.289)
	Log(BPLO)	.0723336 (0.229)	-.0354052 (0.587)
	Age	-.006928 (0.651)	.0485043 (0.019)
	Constant	-1.680367 (0.018)	-.4708998 (0.639)
	$R^{2overall}$	0.5023	0.2275
	Wald (F) sign.	64.13 (0.0000)	4.95 (0.000)
	Hausman	11.25 (0.1877)	21.20 (0.0066)
	N	146	146

Note : 1. * Represents level of significance at 5%.
2. Hausman test is used for fixed effects (fe) above random effects (re)
3. N is the number of observations

The results of the analysis shown in Table 7 reveal that the AVLB of MFIs has a positive and significant impact on the operational sustainability of MFIs in Ethiopia. It implies that an increase in average loan balance per borrower

and the size of the institution leads to improvement of the operational sustainability of MFIs in Ethiopia. This result is supported by Xu *et al.* (2016); Mahapatra & Dutta (2017); Heng, (2015); and Quayes (2012) which revealed that depth of outreach is positively affected by financial sustainability. However, the result report that AVLB is associated negatively to FSS even though it shows a statistically insignificant association.

As reported in Table 7, the cost per borrower has a statistically significant and negative impact on the financial sustainability of MFIs in Ethiopia. This suggests the role of cost reduction in improving financial sustainability. This finding is in line with the findings of Dissanayake, (2012); and Mahapatra & Dutta (2016) which noted that a cost per borrower negatively influences the operational sustainability of Indian MFIs in a significant way.

Table 7 displays the results of the influence of the age and size of the MFIs on the financial sustainability of the MFIs. It illustrates that the age & size of MFIs have a positive and statistically significant link with financial self-sufficiency. While only the size of MFIs has a positive and statistically significant association with operational self-sufficiency. It implies that an increase in age and size of the MFI leads to enhancing the financial sustainability of the MFIs. This result is in contradiction with the study of Heng, (2015) which noted that the age of MFIs is not statistically significant. However, it is supported by the study conducted by Ayi & Maty (2010) which argued that age of MFIs has a positive but lesser influence on attainment of financial sustainability, about the result of the effect of MFIs size on sustainability. It is in line with the results of Bogan *et al.* (2007) which shows that log of assets is significantly related to increased operational sustainability.

The coefficient of PaR greater than 30 days is negatively related to OSS at 5% level of significance. It implies that if the level of PaR is increasing, it has an adverse influence in growing the operational self-sufficiency level of MFIs, contrary to this result, Heng (2015) noted that portfolio at risk greater than 90 days would not deteriorate the sustainability of MFIs. Besides, PaR greater than 30 days is negatively related to financial self-sufficiency, but it is not statistically significant.

From the result reported in Table 7, it also shows that the percentage of women borrowers has no significant association with both OSS and FSS. In support of this result, Hossain & Khan, (2016) revealed the percentage of female borrowers had no significant influence on the financial sustainability of

microfinance institutions in Bangladesh. Regarding the link between BPLO and financial sustainability of MFIs, borrowers per loan officer is positively associated with both OSS and FSS, but it is not statistically significant. The insignificant association of borrowers per loan officer with financial sustainability is supported by results of the study conducted by Hossain & Khan (2016) which states borrower per staff members had no significant impact on financial sustainability of MFIs in Bangladesh during the study period. Besides, the debt to equity ratio of MFI is negatively & insignificantly linked in relation to both OSS and FSS.

CONCLUSION

This study examined the factors of the financial sustainability of Ethiopian MFIs using panel data for 20 microfinance institutions containing 155 observations, for the period 2009-2016. The results specified that MFIs' OSS is positively and significantly affected by the average loan balance per borrower and size of the MFI. Also, FSS is positively and significantly influenced by the size & age of MFI. Besides, cost per borrower have a negative and significant impact on both operational self-sufficiency as well as financial self-sufficiency, however, PaR > 30 days has a negative and significant influence on financial self-sufficiency. Thus, loan balance, efficiency, portfolio quality, and size & age of MFI are the contributing factors of the financial sustainability of microfinance institutions in Ethiopia. This study suggests Ethiopian MFIs to enhance their economies of scale which leads to efficiency of the MFIs. The target for MFIs should be to come up with a mechanism to reduce cost per borrower as well as portfolio at risk to enhance their level of financial sustainability.

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