Financial Sustainability of Microfinance Institutions (MFIs) of Bangladesh

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Abstract

Microfinance is a form of banking service providing financial support to unemployed or vulnerable groups. The microfinance models emphasise on alleviation of poverty and women empowerment by improving financial access and services. However, the positive impacts of microfinance institutions on the welfare of the poor are sustainable only if the institutions achieve a good financial performance. The aim of this study is to identify factors affecting financial sustainability of MFIs in Bangladesh. The study followed an econometric research approach using an unbalanced panel data set of 145 observations from 29 MFIs over the period 2008-2012 in Bangladesh. Among the 29 MFIs only 4 MFIs have found less than 100% FSS. The study found that capital assets ratio, operating expense and write-off ratio affect the financial sustainability of MFIs in Bangladesh. However, MFI size, Age of MFI, borrower per staff members, ratio of savings to total assets, debt equity ratio, outstanding loan to total assets and percentage of female borrowers had no significant impact on financial sustainability of MFIs in Bangladesh during the study period.

Keywords: Microfinance Institutions (MFIs), financial sustainability, Bangladesh

Introduction

At present, poverty alleviation is a major issue all over the world. The main objective of Microfinance Institutions (MFIs) is the outreach to the poor by making available financial services in a supportable base. There were growing needs for financial services among the poor communities especially from those who were financially constrained and vulnerable but have feasible and promising investment ideas (Morduch, 2005; Morduch & Haley, 2002).However, in the last two decades or more there has been a foremost change in the importance from the social objective of poverty alleviation towards the economic objective of sustainable and market based financial services.

Therefore micro finance institution should be an effective development agent and alleviate poverty (OECD, 1996). Microfinance is of greater importance in the developing countries given several factors. Firstly, the Government has introduced microfinance as a poverty alleviation and economic development toll. Secondly, a large number of populations in developing countries live in rural areas, which do not have easy access to the banking sector.

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 in various countries (Morduch and Haley, 2002). Ledgerwood (1999) points out that the aims of microfinance institutions 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. In short, microfinance institutions are expected to reduce poverty, which is considered as the most important development objective (World Bank, 2000).

This is highly remarkable that Microfinance institutions in Bangladesh have been able to ensure the continuous provision of credit services to the poor households. Over the last three decades, a rapid growth took place in microfinance sector. It had started in the mid of 1970's, when a team of researchers at Chitagong University, led by Prof Yunus, initiated an action-research program, known as the 'Jobra' experiment, which provided loans to poor households in a few villages (Zaman, 2004). Later on in 1980's, a large number of Non-Governmental Organizations (NGOs) had experimented with different modalities of providing credit to the vulnerable groups. In 2013, near about 550 regulated and unregulated Microfinance Institutions have reported to the Credit & Development Forum (CDF). Most of the institutions depend on subsidies and grants of donors. With the growing number of microfinance institutions, a question arises i.e. "Are Microfinance Institutions financially sustainable?" Because the positive effects of MFIs on the socio-economic development will be possible when MFIs will achieve a healthy financial and outreach performance (Kinde, 2012). Recently, all over the world, quiet a number of researchers have paid attention to the financial sustainability of MFIs due to its importance in the maintenance of MFIs. The financial sustainability of MFIs is an essential situation for institutional sustainability (Hollis and Sweetman, 1998). Hence, it is argued, "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, p.425).

Past studies were conducted to determine the factors, which are affecting financial sustainability of

MFIs, using large number and highly developed MFIs in various countries. There are different levels of significance of these factors in affecting the financial sustainability of MFIs that differ with studies. Some of the factors are found to be significant in one economy or applicable to a set of MFIs, some are not significant (Cull et al., 2007 & Christen et al., 1995). This paper wishes to evaluate the sustainability of MFIs of Bangladesh. Consequently, the paper examines the indicators influencing the financial sustainability of MFIs in Bangladesh over the period 2008-2012, and gets started to fill this knowledge gap after having the various statistical manipulations. The next sub-section looks at review of literature on the subject. Section three presents the research methodology. Discussion of the results is included in section four. Finally, section five gives the conclusion.

Literature Review
The concept of Microfinance institutions
There are many Scholars and Organizations having different perceptions on the definitions of MFIs. Moreover, the nature of the definitions is generally the same. Microfinance is the provision of small-scale financial services to low income or unbanked people (Kyereboah-Coleman and Osei, 2008; Karlan and Goldberg, 2007; Hartarska, 2005; Lafourcade et al., 2005; Schreiner, 2000; Ladgerwood, 1999; Hulme and Mosley, 1996). 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 and Muuka, 2004, p.145).Correspondingly, the Asian Development Bank (ADB) describes 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 (ADB, 2000).

According to Robinson (2001), microfinance refers to '*small-scale financial services–primarily credit and savings– provided to people who farm or fish or herd; who operate small enterprises or microenterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages or commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and groups at the local levels of developing countries, both rural and urban*'. Schreiner and Colombet (2001) define microfinance as '*the attempt to improve access to small deposits and small loans for poor households neglected by banks*'.

From the above explanations, we may use the term microfinance to mean the provision of small scale loans, savings, deposits and other financial services to the poor and those institutions which are providing these micro financial services are known as Microfinance Institutions (MFIs) or Microfinance Organizations (Mersland and Strom, 2008).

Microfinance institutions are regarded as a tool for poverty alleviation by providing easy access to finance and financial services. According to Basu et al.2004, MFIs balance successfully the formal banking sector in providing financial services to the poor. The motivation of improving finance comes from the evidence that empowerment of the poor through increasing income generating capacity allows the poor to access all development requirements to get out of incapacitate dimensions of poverty and condense their vulnerability to unexpected events (Davis et al., 2004). Morduch (1999) describes MFIs as specialized financial organizations, united under the banner of microfinance, ensuring to work in the direction of financial inclusion. However, studies (e.g. Ahlin and Jiang, 2008) suggest that these assistances of microfinance are appreciable only as long as the poor remain to be clients of microfinance institutions. This will make MFIs as the weapon to eliminate poverty. Ledgerwood (1999) regards MFIs as providers of such financial services to poor—mainly credit and savings—although insurance and other payment services are rendered by some.

Financial Sustainability of Microfinance Institutions
Generally, sustainability has been defined as permanence (Navajas, 2000) also the capability to recurrence performance over time (Schreiner, 2000). It "allows the continued operation of the microfinance provider and on-going provision of financial services to the poor" (CGAP, 2004: 1). Sustainability in MFIs concerns with the capability of institutions to manage their operating costs through operating revenue generated from their own operations (Woller et al., 1999; Ladgerwood, 1999; Thapa et al., 1992) without depending on external support or subsidy. Dunford (2003) has defined financial sustainability of MFIs as the ability to operate microfinance objective without any support from donor. Sustainability in MFIs generates continuous operation of the institution when donor and funding partners are unable to arrange funds for operations. Hence, there is the question of how capable are MFIs to run with operations in the future without depending on subsidies from donors (Conning, 1999; Woller and Schreiner, 2004).

Financial viability is measurable in two stages viz. Operation Sustainability (OSS) and Financial Self-sufficiency (FSS). According to Meyer (2002), operational sustainability refers to the ability of the Microfinance Institution to capture its operating costs from its operating income whether it is subsidized or not. However, MFIs are financially self-sufficient when they are able to manage their both operating and financing costs from

their own generated income and other form of subsidy valued at market prices.

Ahlin et al. (2011) argue that the success of MFIs depends on the country-level context, in specific macroeconomic and macro-institutional features. Evidence arises from their study, between MFI performance and the broader economy has complementarity, also suggestive of substitutability or rivalry. A study in 2009 by Anduanbessa, T. (2009) found that profit margin, OSS, return on asset and gross loan portfolio-to-total asset ratio load high on the other components, established the financial sustainability dimension. The number / types of financial services rendered, the number of staff per branch and their capital are found to determine the outreach performance of the MFIs in the country. Furthermore, a study conducted by Kinde (2012) on Ethiopian MFIs to identify the factors affecting financial sustainability of MFIs and the study shows that breadth of outreach, depth of outreach, dependency ratio and cost per borrower affected the financial sustainability of MFIs in Ethiopia.

Therefore, the above definitions of financial sustainability suggest that a loss-making MFI (MFI with low financial performance) will not be considered as financially sustainable. Similarly, a profit-making MFI, whose profitability is specified after capturing some of the operating costs by subsidies' resources or funds, will also not be classified as financially sustainable. Thus, Financial Self-Sufficiency (FSS) = Adjusted Revenue / Adjusted Expense, while FSS is centred around 1 (if FSS $\geq$ 1, then institutions are financially self-sufficient).The FSS ratio is a measure of an institution's ability to generate sufficient revenue to cover its costs. The financial self-sufficiency ratio is adjusted financial revenue divided by the sum of adjusted financial expenses, adjusted net loan loss provision expenses, and adjusted operating expenses.

Figure 1 presents sustainability status of the MFIs of Bangladesh as of 2012. The financial self-sufficiency of Bangladeshi MFIs ranges from the highest 159% (SDC) to the lowest 9% (DSK). But there is sudden decrease in financial self-sufficiency of DSK due to high loan loss rate while last year was 101%. More specifically, almost all of the MFIs have already achieved financial self-sufficiency (i.e., having more than 100% FSS). On the other hand, only few MFIs (CTS, DSK, RDRS and SKS Bangladesh) are the least sustainable MFIs (i.e., having less than 100 % FSS).

Microfinance Explanatory variables considered in the model

Percentage of female borrower basis the most important indicator considered as explanatory variable in the model. In the model, this variable finds application to get depth of outreach of MFIs. This variable is hypothetically negative with financial sustainability.

The size of MFI is calculated by the value of its assets (Mersland and Strom, 2009; Harmes et al., 2008; Mersland and Strom, 2008; Bogan et al., 2007; Hartarska, 2005; Lafourcade et al., 2005). According to Cull et al., (2007) MFI size is significantly and positively related to its financial sustainability. The number of borrowers is also used to measure, whether the size of MFI affects its outreach (Mersland and Strom, 2009; Harmes et al., 2008; Mersland and Strom, 2008; Bogan et al., 2007; Lafourcade et al., 2005). Large scale MFIs have a lower cost operational system, which helps them to acquire wide outreach and thereby become financially sustainable. The age of MFI also, has impact on sustainability. Age mentions the period that an MFI has been in operation since establishment. MFIs ages associate their efficiency and growth in terms of outreach especially in the early period operations (CGAP, 2009; Cull et al., 2007; Gonzalez, 2007). Robinson (2001) suggests that mature MFIs can acquire substantial outreach to the vulnerable groups. Furthermore, Bogan et al. (2007) and Cull et al. (2007) also found that the age of MFI has impact on financial sustainability. Thus, the variables, size and age of MFI are hypothesized to have positive relationship with financial sustainability.

The efficiency of MFI could be measured by its productivity (for instance, Borrowers per Staff Member). The productivity ratio is measured as the ratio of total number of staff required to produce a given level of output as actual borrowers, is used and it is estimated to be positively associated with financial sustainability. Woller and Schreiner (2002) observed the determinants of financial viability and it noticed that productivity was significant determinant of profitability. Moreover, Ganka (2010) in his recent study found a negative and statistically significant relationship between borrower per staff member and financial sustainability. Whereas, Christen et al. (1995) found that there was no link between productivity and financial sustainability.

To what extent Deposit intermediation effects microfinance feasibility is captured by savings assets ratio. This variable accounts for the funding source of the MFIs. It is supposed that deposits were found as a lower cost and conceivably the cheapest source of finance for MFIs. It is positively hypothesized with the financial sustainability. The ratio of outstanding loans to assets is used as a proxy indicator for liquidity of institution. It is also assumed to have a positive effect on institutions' financial viability. A write-off ratio that is commonly used indicator for credit risk management is also contained within the model and is hypothesized to have a negative impact on institutions' financial sustainability. The variable Operating Expense is included in the model to show the ratio of operating expense to gross loan portfolio. This variable indicates the expense of serving loan to the borrowers. It is hypothesized to have a negative relationship with the financial sustainability.

Data and Methodology

The study analyses financial sustainability of microfinance institutions in Bangladesh. The secondary data is obtained from the Microfinance Information Exchange, USA (www.mixmarket.org), over the period of 2008-2012. There are almost 86 Bangladeshi MFIs in the MIX market website. Out of the total listed MFIs, 29 MFIs are selected for the study, as complete data for the period is available only for 29 MFIs.

The paper uses 10 indicators as proxies for financial sustainability of MFIs. The study contains logarithm of the total assets, Age of MFIs, ratio of loans outstanding to total assets, ratio of total debt to total equity, ratio of savings to total assets, ratio of female borrowers to total number of active borrowers, ratio of total equity to total assets, ratio of operating expense to gross loan portfolio, write-off ratio and borrowers per staff member ratio.

In this study, Financial Self-Sufficiency (FSS) of Microfinance Institutions is the dependent variable and use as a main measure to evaluate MFIs sustainability. Measuring financial sustainability of MFIs is quite difficult because most of the MFIs are subsidized, where some subsidies are in kind form. After taking over a look on previous studies and seeing the results in the Bangladeshi context and the outcomes with prior empirical studies in developed and developing countries, measures relating to factors affecting financial sustainability were taken from reviewing previous studies. Thus, the Mix market definition is used to measure financial sustainability. Table 1 presents the possible factors that affect financial sustainability of MFIs with their hypothesized impact.

The character of data used in this study allows the researcher to use panel data model that is considered to have advantages over cross section and time series data methodology. It engages the pooling of observations on a cross-section of units over several periods. A panel data approach is more suitable than either cross-section or time-series data alone. As Brook (2008) suggests the advantages of using the panel data set; first it can report a broader range of matters and solve more complex problems. Moreover, by uniting cross-sectional and time series data, one can increase the number of degrees of freedom, and thus the power of the test. It can also help to assuage problems of multicollinearity among explanatory variables that may arise if time series approach is used individually.

Given the size of the sample, the study estimated the relationship between dependent and explanatory variables by ordinary least square (OLS) reduced-form equations of the form: $Y_{it} = \sigma_i + \beta'X_{it} + \varepsilon_{it}$

Where Y_{it} is the value of the dependent variable for cross section unit i, at time t, where i = 1… N; σi is a heterogeneity or individual effect. Kinde (2012) stated that $\sigma\mathbf{i}$ contains a constant term and set of distinct variables which could be observed, such as type of MFIs, lending type, MFIs zone which are taken to be constant over time. X_{it} is the explanatory variable with a coefficient β, and ε_{it} the error term. Observations are at the MFI level, and do not represent individual borrowers. The dependent variable is always an indicator of financial sustainability and the independent variables are possible determinants of financial sustainability. Therefore, the operational model for the empirical investigation used in this study is given as:

$$FSS_{it} = \beta0 + \beta1(WOMEN_{it}) + \beta2(SIZE_{it}) + \beta3(AGE_{it}) + \beta4(LOAN_{it}) + \beta5(CA_{it}) + \beta6(BPS_{it}) + \beta7(DER_{it}) + \beta8(DEP_{it}) + \beta9(OE_{it}) + \beta10(WOR_{it}) + \acute{\varepsilon}$$

Where, FSSit, ratio of adjusted revenue to adjusted expense for firm i in period t; WOMEN$_{it}$, ratio of women borrower to total active borrower for firm i in period t; SIZE$_{it}$, logarithm of the total assets for firm i in period t; AGEit, age of MFIs is the number of years since established for firm i in period t; LOANit, ratio of loans outstanding to total assets for firm i in period t; CAit, ratio of total equity to total assets for firm i in period t; BPSit, borrowers per staff member for firm i in period t; DER$_{it}$, ratio of total debt to total equity for firm i in period t; DEP$_{it}$, Ratio of saving to total assets for firm i in period t; OE$_{it}$, ratio of operating expenses to gross loan portfolio for firm i in period t; WOR$_{it}$, share of total amount of loans that are written-off from the gross loan portfolio for firm i in period t; and $\acute{\varepsilon}$ the error term.

From the above multivariate regression equation, the effect of each of the independent variables on financial sustainability estimate was evaluated in terms of the statistical significance of the coefficients 'βi'. According to Wooldridge (2006), when some variables affect the dependent variable which were not included in the model and estimating the coefficients without controlling for these variables lead to omitted variables bias. And the nature of omitted variables leads the way of control, whether they are constant or changing over time and whether they are constant or changing over cases. These are also known as the time specific and individual specific effects of unobservable or omitted variables, and the econometrics literature suggests two common methods of dealing omitted variables; fixed effect and random effect (Hsiao, 2007).

In selection between random effect (RE) and fixed effect (FE) models the study run the Hausman test (Table 2) which compares the coefficients of two estimators; RE is considered under null hypothesis. Thus, the test result shows that the RE provides consistent estimates compared to FE model. The Hausman test statistics significant and therefore, we could reject the null hypothesis. This indicated that the FE model is appropriate.

Empirical Results
Assumption Test

Correlation analysis has been performed to check for potential multicollinearity problem in the regression. Table 3 presents summary on the degree of correlation between the explanatory variables used. Analysis shows the high correlation between BPS and LOAN which is -0.56. The correlation matrix indicates that in general the correlation between the included explanatory variables is not strong and hence that multicollinearity may not be a serious problem to the study. It is clearly noticed from the Table 5, there is no autocorrelation problem because the Durbin-Watson statistic value of 1.93768 which is less than the value of 2.0. Heteroscedasticity, known as violation of homoscedasticity, means a situation in which the variance of the dependent variable varies across the data. To check Heteroscedasticity problem with the regression model, the Likelihood Ratio (LR) test was conducted. The LR test result of 14.5812 is less than the chi-square value of 18.30704 which indicates there is no heteroscedasticity problem in the regression model.

Descriptive Statistics

Table 4 states the descriptive statistics of the variables used in the analysis of financial sustainability containing their mean, standard deviation, minimum and maximum values for the sample of 29 MFIs during the period 2008-2012. The financial sustainability (FSS) indicates the ability of MFI to cover all of its operating costs and costs of capital without depending on subsidies. Table (4) shows the mean of FSS at 1.0836 (108.36 per cent) indicating financial sustainability. This study comprised of 145 observations out of which 113 (77.93 per cent) indicated sustainable MFIs and the remaining 32 observations (26.07per cent) of the MFIs were not financially sustainable.

The percentage of female borrowers indicates the depth of outreach. The mean of this variable is 0.9009. The highest percentage point of female borrowers (100 per cent) is indicating that many MFIs have only female borrowers. Standard deviation of this variable is very low that means most of the MFIs deal with female borrowers. Hence, this variable suggests that Bangladeshi MFIs had better performance in the depth of outreach.

Borrower per Staff (BPS) is the proxy indicator of Productivity. However, serving a loan client can be more laborious and expensive than serving a depositor; because it involves a chain of meetings and place visits before the loan can be distributed. All things being equal, the higher number of borrowers per staff would indicate productivity of MFI staff (CGAP, 2003b). The descriptive statistics shows that the mean number of borrower per staff for Bangladeshi MFIs is 141.462. The minimum and maximum borrowers per staff are 67 and 331 respectively. The mean of debt equity ratio (DER) is 7.1684 suggesting the predominant debt financing scheme of MFIs in Bangladesh. As, Kinde (2012) found in his study on Ethiopian MFIs.

Two most important proxy indicators of credit risk management are Operating Expense (OE) and Write-Off ratio (WOR). Their mean values are so low 0.1508 and 0.0056 respectively. The OE variable indicates that Bangladeshi MFIs serve loan to borrowers with very low cost. The WOR variable shows that management of Bangladeshi MFIs is very strong.   Standard deviation of those variables is also very low.

The descriptive result shows that the mean DEP is 0.3169. That means the contribution of savings on fund assets is 31.69per cent. Therefore, Bangladeshi MFIs are extremely dependent on other fund sources. The mean value of MFI AGE is 25.69 and the minimum and maximum ages are 10 and 40 respectively. The result shows that Bangladeshi MFIs are old on an average and old MFIs have better performance in sustainability.

Econometric Results

The study of this section presents the econometric results for the factors affecting the financial sustainability of microfinance institutions of Bangladesh. The econometric result is shown in table 5, the adjusted R^2 value indicates that the dependent variable as explained by the independent variables is 45.6 per cent. However, (Cameron, 2009 cited in Ganka, 2010) states that the value of R^2 above 0.2 is large enough for reliable conclusion.

The outcome from the econometric analysis suggests that the arrangement of various sources of capital 'Capita Assets Ratio' (CA) of MFIs does not improve their financial sustainability. The CA variable has a negative relationship with financial sustainability of MFIs and is statistically significant at 1 per cent significant level. The (CA) variable signifies the percentage of equity to total assets. Hence, the negative coefficient shows that the larger an MFI is, equity financed as compared to other sources of finance leads not to improvement in its sustainability.

As predicted, the econometric result reveals a positive relationship between size of MFIs and their financial sustainability, indicating that large MFIs lead to be more financially sustainable. It could be accepted from the result that larger MFIs are capable of taking advantages of economies of scale and the outcome supports the market power premises. While the result contradicts with the finding by Hartarska 2005, it is consistent with previous findings of Cull *et al.,* (2007); Mersland and Strøm, (2009), and Bogan et al., (2007).

The literature of MFIs suggests that female borrowers relate to higher repayment rate (Makombe *et al.*, 2005; Premchander, 2003; Kabeer, 2001; Mayou, 1999), which leads to financial sustainability of MFIs. The econometric results indicate a negative relationship between percentage of female borrowers and financial

sustainability indicating that percentage of female borrowers does not improve the financial sustainability of MFIs where on an average female borrowers is more than 90 per cent. However, results also show, their relationship is not statistically significant even at 10per cent significant level.

If all other things are assumed as constant, the higher number of borrowers per staff indicates the efficiency of MFIs in operating their staff. Similarly, the econometric results indicate that the borrowers per staff member are positively related to the financial sustainability. The positive coefficient of this variable shows that the increase in number of borrowers per staff increases the financial sustainability of MFIs of Bangladesh. This suggests that the larger the number of borrowers to be served by a staff, the more financially sustainable the MFIs will be.

The coefficient of deposit (DEP) is positive but not statistically significant even at 10 per cent significant level. The deposit variable represents ratio of savings to total assets. This provides us suggestion that MFIs depending on deposits for funds will lead to better financial sustainability of MFIs. The outstanding loan to asset ratio (LOAN) variable has a negative impact on financial sustainability of MFIs.

The econometric result reveals that there is a negative and statistically significant relationship between sustainability of MFIs and credit risk management. This relationship is significant at 1 per cent significance level. Write-off ratio is used as a proxy for credit risk. The negative relationship suggests that increase in write-off ratio will lead to fall in financial sustainability of MFIs and spread out weak risk management.

The variable operating expense (OE) has extremely negative and statistically significant relationship with the sustainability of MFIs. This relationship is significant at 5 per cent significance level. The OE variable represents here, ratio of operating expense to gross loan portfolio. Thus, the result provides us evidence that an increase (decrease) in operating expense to serve loan reduces (increases) MFIs sustainability.

Conclusions

This paper is aimed at measuring the performance of Bangladeshi MFIs focusing on sustainability for the period of 2008-2012. Based on the empirical evidence from the econometric analysis, the conclusion would be that MFI capital assets ratio (CA), operating expense (OE) and write-off ratio (WOR) affect the financial sustainability of Bangladeshi MFIs. The results for these explanatory variables are statistically significant at different levels of significance. Whereas, CA and WOR are significant at 1per cent level of significance; OE at 5per cent level of significance respectively. Other indicators described to be significant in other studies were not significantly influencing the financial sustainability of MFIs in Bangladesh. These are age of MFI (AGE), borrower per stuff member (BPS), ratio of savings to total assets (DEP), debt equity ratio (DER), outstanding loan to total assets (LOAN), Logarithm of the total assets of the MFI (SIZE) and percentage of female borrowers (WOMEN).

This paper includes 29 MFIs of Bangladesh, among them only 4 MFIs have found less than 100% FSS. Consequently, the conclusions made in this study suggest that microfinance institutions in Bangladesh should first reduce their dependency on equity or subsidized income to be operationally competent in the market, and then financially sustainable. However, it's a long time since MFIs have started working in Bangladesh but still they are dependent on equity or subsidized income. Although, Bangladeshi MFIs have large asset power which is very helpful to make them financially sustainable. Econometric results also proved our hypothesis on Operating expense and Write-Off ratio that means MFIs of Bangladesh have low cost operating system in serving loan and their management is quite strong. As well as, Bangladeshi MFIs have experienced staff to run their activities that lead the MFIs to sustainability. Age has no impact on Bangladeshi MFIs.

Acknowledgment

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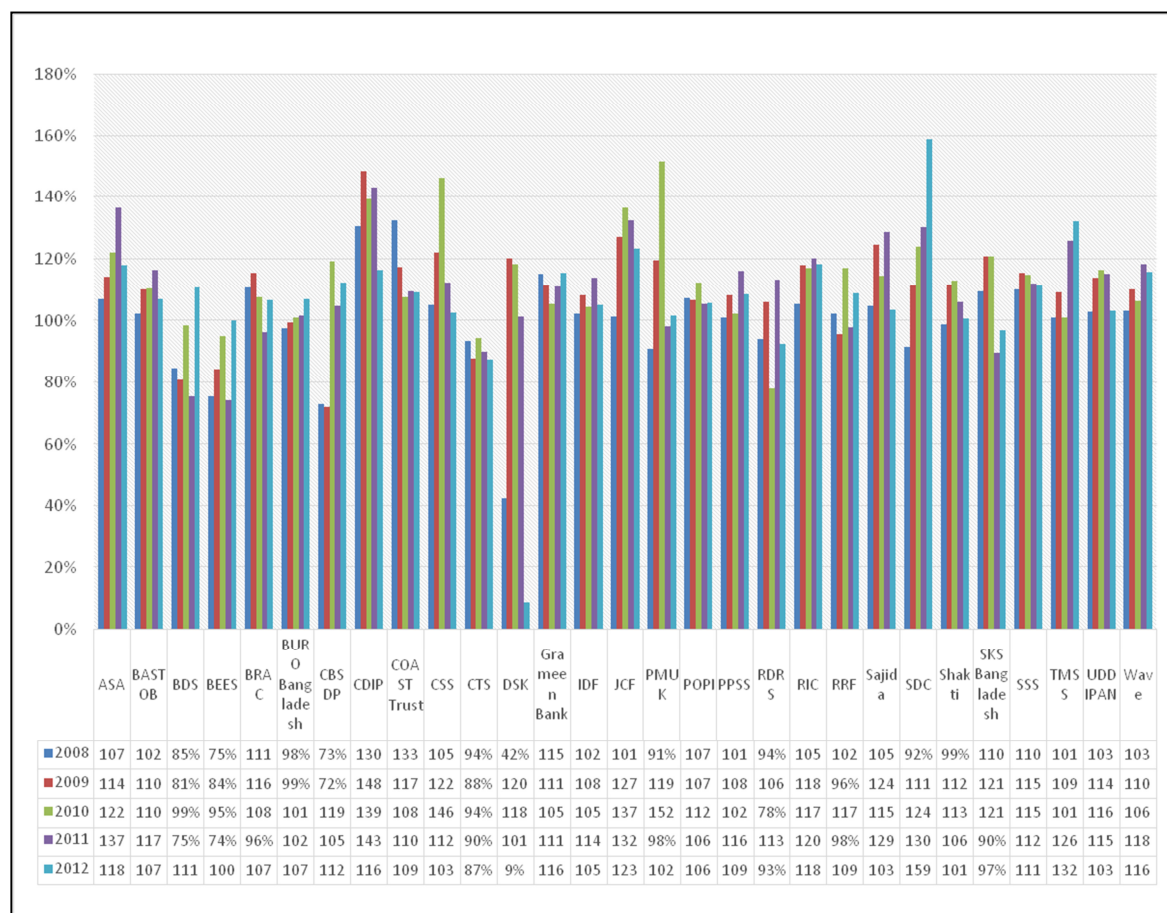
Appendix:

Figure 1: Financial Sustainability by Institution, 2008-2012

Table 1: Potential Determinants, Measures and Hypothesized Impact

Variable	Notation	Description	Hypothesis
Dependent Variable			
Financial Self-Sufficiency	FSS	Adjusted revenue/Adjusted(Financial Expense +Impairment Losses of Loans +Operating Expense)	
Independent Variables			
Age	AGE	Age of MFIs is the number of years since established	**+**
Size	SIZE	Logarithm of the total assets of the MFI.	**+**
Loans	LOAN	Ratio of loans outstanding to total assets	**+**
Debt to Equity Ratio	DER	Ratio of total debt to total equity	**_**
Deposits	DEP	Ratio of saving to total assets	**+**
Share of Women	WOMEN	Ratio of number of women borrowers to the number of active borrowers	**_**
Capital assets ratio	CA	Ratio of total equity to total assets	**+**
Operating Expenses	OE	The ratio of operating expenses to gross loan portfolio	**_**
Write-Off Ratio (WR)	WOR	The share of total amount of loans that are written-off from the gross loan portfolio	**_**
Borrower Per Staff Member	BPS	Ratio of number of Active Borrowers to total number of Personnel	**+**

Table 2: Hausman test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	38.709164	10	0.0000

Table 3: Correlation between independent variables

	AGE	BPS	CA	DEP	DER	LOAN	OE	SIZE	WOMEN	WOR
AGE	1.000000	-0.064525	0.200177	0.249926	-0.072184	-0.214491	-0.182019	0.353057	-0.217392	0.218352
BPS	-0.064525	1.000000	-0.388717	-0.105905	0.063202	-0.563803	0.514477	-0.032194	0.001503	-0.126351
CA	0.200177	-0.388717	1.000000	0.089615	-0.237266	0.180028	-0.073613	0.045928	0.061319	0.108239
DEP	0.249926	-0.105905	0.089615	1.000000	-0.005907	-0.159704	-0.134398	0.408318	0.165214	0.011631
DER	-0.072184	0.063202	-0.237266	-0.005907	1.000000	-0.059531	-0.045557	-0.030701	-0.044412	-0.212136
LOAN	-0.214491	-0.563803	0.180028	-0.159704	-0.059531	1.000000	0.165790	-0.319523	0.052225	0.064900
OE	-0.182019	0.514477	-0.073613	-0.134398	-0.045557	0.165790	1.000000	-0.227940	0.000666	-0.082197
SIZE	0.353057	-0.032194	0.045928	0.408318	-0.030701	-0.319523	-0.227940	1.000000	0.056660	0.112307
WOMEN	-0.217392	0.001503	0.061319	0.165214	-0.044412	0.052225	0.000666	0.056660	1.000000	-0.010015
WOR	0.218352	-0.126351	0.108239	0.011631	-0.212136	0.064900	-0.082197	0.112307	-0.010015	1.000000

Table 4: Descriptive Statistics of Variables used in the Model.

Variable	FSS	AGE	BPS	CA	DEP	DER	LOAN	OE	SIZE	WOMEN	WOR
Mean	1.0836	25.69	141.462	0.1818	0.3169	7.1684	0.0073	0.1508	16.951	0.9009	0.0056
Median	1.0897	25	129.00	0.1519	0.2905	5.48	0.007	0.1429	16.694	0.9585	0
Maximum	1.5907	40	331.00	0.6652	0.8725	111	0.0133	0.704	21.365	1	0.0752
Minimum	0.0881	10	67.00	-0.0188	0.1586	-93.05	0.0028	0.0819	13.806	0.0368	0
Std. Dev.	0.1804	7.6772	48.195	0.1356	0.1246	14.48	0.0024	0.0693	1.6966	0.1731	0.0134

Table 5: Econometrics Results for the Determinants of Financial Sustainability.

Dependent Variable: FSS; Method: Panel Least Square (cross-section fixed)				
Total Panel (unbalanced) observations: 145				
Variable	Coefficient	Std. error	t-Statistic	Prob.
C	-0.019392	1.739059	-0.011151	0.9911
AGE	-0.020414	0.021755	-0.938388	0.3502
BPS	0.174000	0.125523	1.386198	0.1687
CA	-1.102629	0.368382	-2.993167	0.0035***
DEP	0.523800	0.461455	1.135104	0.2590
DER	0.001158	0.000937	1.235736	0.2194
LOAN	-7.852520	19.06916	-0.411792	0.6813
OE	-1.063848	0.455653	-2.334776	0.0215**
SIZE	0.087894	0.111927	0.785277	0.4341
WOMEN	-0.094853	0.126518	0.749718	0.4551
WOR	-3.177534	1.221210	2.601956	0.0106***
R-squared	0.602578	Mean Dependent Variable		1.083621
Adjusted R-squared	0.455956	Durbin-Watson stat		1.93768
S.E. of Regression	0.133063	F-statistics		4.109748
Log Likelihood	107.7136	Prob.(F-statistics)		0.000000
***Significant at 1%; **Significant at 5%; *Significant at 10%				