

Article

Capital Structure, Financial Performance, and Sustainability of Micro-Finance Institutions (MFIs) in Bangladesh

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Abstract: Capital structure plays an important role in organizational performance. Sources of funds for micro-finance institutions (MFIs) and their performance and financial sustainability become an important topic for the MFIs and poverty alleviation initiatives to achieve sustainable development goals of the UN. We explored the following question: Does the financial structure in terms of financial leverage affect the financial performance: Financial sustainability, depth, and breadth of outreach of MFIs? Our research focuses on studying the relationship between capital structure and financial performance of micro-finance institutions as well as achieving the objectives of this program by reaching out to the deserving clients without collaterals. A dataset of 187 MFIs is used to establish the relationship between the capital structure and performance of MFIs. Panel data regression analysis has been used for this study using the Random effect and Fixed effect models. Return on Asset (ROA), and Net Income to Expenditure (NIER) have been used as measures of financial performance. The findings indicate that Equity to Asset Ratio (EAR), Debt to Loan Ratio (DTL), Risk, and Size are the factors that influence NIER. Furthermore, EAR, and DTL have a positive effect on ROA, and Risk has a negative effect. The findings of this study will enable MFIs to configure their capital structure by creating a portfolio of sources of their capital from market-based sources of funds that can maximize their financial performance and reach out to poor clients without collaterals.

Keywords: micro-finance institutions; capital structure; financial performance; sustainability; reach out

1. Introduction

Poverty alleviation by microcredit is used as an effective tool across the globe [1–3]. Micro-finance has a broader scope than the microcredit, as micro-finance is considered as the financial service package such as credit, savings, insurance, and other financial services targeted at the poor. Thus, institutions offering financial service packages targeting the poor are called micro-finance institutions (MFIs). MFIs often start lending operations to a low-income community and help them to develop different types of micro-entrepreneurial ventures in developing countries. Usually, these clients do not have credit history, collateral, or both [4–6].

Unlike the traditional banking system, the lending of MFIs is known as supervised credit. Most of the clients of micro-finance institutions live in rural areas, and the micro-finance operations are extensively dependent on personal contacts. Field workers of MFIs go to clients' houses to provide

loans and get the weekly collection. Field workers also supervise and advise clients about financial and nonfinancial services. As field workers are involved to provide trade and training services to their clients, MFIs have greater transaction cost per loan. Training, consulting, and organizing poor clients are helpful in building sustainable human resources and empowerment [7–9]. Extra services increase the cost of delivery and subsequently, MFIs charge very high, 20–30%, nominal interest rates to their clients [10]. Commercial banks calculate interest-rates considering costs of funds, bad-debt costs, and administrative costs; whereas MFI loans are subject to additional higher transaction costs including all other costs [11]. Despite the higher interest rates, poor households take loans from MFIs as they do not have a cheaper alternative. They do not have access to a loan from other financial institutions except for local money lenders due to lack of collateral. Money lenders ask for almost 100% interest rates, which are two to three times higher than the MFIs' interest rates. That is why the poor take loans from MFIs to change their socio-economic condition. With the loan from MFIs, they can create small and micro-enterprises, create income-generating activities for themselves and their family members, and can come out of poverty.

Unlike typical financial institutions, MFIs are facing two types of challenges; first, they provide a small amount of financial services to the poor, and secondly, they need to cover their expenditures to sustain their businesses. That is why MFIs have both financial and social performance goals. The financial goal, which is also known as sustainability is related to the institution's financial feasibility and its capacity to earn profits and run its operations smoothly. On the other hand, the social performance goal or outreach has two scopes: Depth of outreach and breadth of outreach. The depth of outreach is measured by the average loan size divided by the country's gross national income (GNI) per capita, which reflects the poverty level of clients. The breadth of outreach is measured by the number of clients reached, which reflects the size of the clientele base. MFIs need to arrange their capital to maintain sustainable operations and also to focus on outreach for their success. Both social sustainability and financial sustainability are the goals for Non-governmental Organizations (NGO) [12]. Many MFIs in developing countries have had limited achievements in cost efficiency [13]. There is a trade-off/challenge for MFIs to choose between financial sustainability and/or social sustainability [4]. According to Microcredit pioneer Yunus [14], MFIs' financial sustainability can lead to social outreach as a financially sustainable institution can ensure long-term operation and service to the poor community. A sustainable or efficient MFI can serve the social purpose better than a bankrupt MFI.

In Bangladesh, there are different types of organizations that provide micro-finance services, ranging from NGOs to relatively large organizations, like Grameen Bank, Credit Unions, Credit Co-operatives, and Rural Banks. In the beginning, micro-finance service was offered by NGOs and gradually, it got an institutional shape offering micro-finance services based on market principles. There are different types of sources of funds for MFIs. They receive funds from international donors, local governments, and market-based sources such as banks, financial markets, and other investors. Donor funding and subsidized funding were the main sources of funds for MFIs in Bangladesh in the past. However, over time, donor support and subsidized funding have declined. As a result, MFIs are increasingly relying on market-based funding. Thus, the source of funding of MFIs now is the combination of subsidized and market-based funding. This study focuses on the effect of capital structure or sources of funds on MFIs' performance, and on identifying opportunities for improving their sustainability. We examine if the sources of financing have any significant effect on the financial performance of MFIs. If proportional subsidized financing is more than other sources of financing, it may affect their performance negatively because they might not be very serious in utilizing their capital efficiently. On the other hand, because of low-cost funds, it may affect their performance positively because they may perform efficiently. On the other hand, MFIs that function with private money need to work hard to make it a profitable business as they have costly funds, so it may affect their performance positively or negatively. Thus, the capital structure or source of funding may positively or negatively influence the financial performance of the MFIs. Only a few studies have addressed the relationship between capital structure or sources of funds and performance of the

MFIs. No serious empirical work in Bangladesh exclusively focuses on understanding the relationship between the capital structure of MFIs and their financial performance. This study aims to fill this gap. More particularly, this study attempts to measure the effects of capital structure on MFIs' performance measured by financial self-sufficiency and return on asset. The objective of this study is to identify how capital structure composition (Equity to Asset, Debt to Loan, Deposit to Loan, and Deposit to Asset) affects the performance of MFIs from Bangladesh, where the level of poverty is wide and deep, and MFIs are fastest in growing by focusing on Return on Assets (ROA), Net Income to Expenditure (NIER), and operational and financial self-sufficiency. As donor funds for micro-finance services are depleting, only financially sustainable MFIs might survive by tapping into capital from investors on a cost-benefit basis. That is why this study investigates the role of different kinds of capital sources and their effects on the performance of MFIs. Based on the previous discussions, the current study aims to answer the following research questions: "Is there any relationship between capital structure or sources of capital and the performance of the MFIs? What are the factors that determine the financial performance of MFIs?" The following Sections 2 and 3 discuss overview of micro-finance industry as well as capital structure and performance of MFIs. Section 4 describes methodology and Section 5 presents the discussions/analysis of our results. Finally, Section 6 provides the conclusion.

2. Overview of Micro-Finance and Its Institutions in Bangladesh

MFIs have played a significant role to improve the socio-economic condition of the poor. Billions of dollars have been distributed to micro-entrepreneurs over the last few decades [1,15]. These loans are very small, as low as US\$75, and are usually short-term loans repaid on a weekly basis over one year. There are more than 67 million households served by micro-finance programs globally [16]. There are 1033 large scale MFIs globally that offered their services to 116.6 million borrowers in 2015 [17]. These financial service providers (FSP) have a gross loan portfolio of US\$92.4 billion and US\$58.9 billion of deposits. The South Asian region have a greater coverage with the primary focus on serving female borrowers, representing 92% of total borrowers [17]. At a global level, FSPs recorded an annual growth of 8.6% in the loan portfolio and 13.5% in borrowers [17]. Further, microcredit performance in terms of repayment and financial sustainability is exemplary [18].

Microcredit programs have occupied a central place in poverty-oriented strategies in Bangladesh [2,19]. Since 1990, Bangladesh experienced rapid economic growth and also achieved tremendous success in developing innovative microcredit models, service, and diversification [20]. Nawaz [21] claims that although microfinance has resulted in a moderate reduction in the poverty alleviation, there are still more prospective clienteles remaining out of reach of many MFIs.

2.1. Micro-Finance Institutions (MFI) in Bangladesh

There are formal and informal microfinance providers offering micro-finance services [22]. The formal–informal structure depends on the degree of supervision by governments outside of the organizational structure and governance [23]. Informal providers have a simple organizational structure, lack government supervision, and consist of moneylenders, traders, deposit collectors, pawnbrokers, community savings clubs, friends and family, and agricultural input providers. Formal providers are credit unions, commercial banks, NGOs, cooperatives, member-based organizations, and a few branches of government banks. In Bangladesh, there are mainly four types of institutions involved in micro-finance activities. These are: (1) Grameen Bank (GB), a member-owned specialized institution, (2) around 1500 Non-Governmental Organizations (NGO) like BRAC, Proshika, ASA, BURO-Tangail, BEES, CODEC, SUS, TMSS, Action-Aid, etc. (3) Commercial and Specialized banks like Bangladesh Krishi Bank (BKB), Rajshahi Krishi Unnayan Bank (RAKUB), and (4) government sponsored microfinance programs like BRDB, Swanirvar Bangladesh, RD-12, and others which are run through several ministries viz., Ministry of Women & Children Affairs, Ministry of Youth & Sports, Ministry of Social Welfare, etc. Credit services of these institutions can be divided into six groups: (i) General microcredit for small-scale self-employment-based activities, (ii) microenterprise loans, (iii) loans

for ultra-poor, (iv) agricultural loans, (v) seasonal loans, and (vi) loans for disaster management. Loan amounts of up to BDT 50,000 or US\$600 are generally considered as microcredit, and loans above this amount are considered as microenterprise loans. As per Microcredit Regulatory Authority, for the 2015–2016 economy year, the total loan amount of microcredit was BDT 1005.57 billion or US\$12.07 billion, outstanding amount was BDT 618.76 billion or US\$7.43 billion, number of microcredit clients were 31.07 million, total clients of Microfinance Institutions were 36.20 million, savings was BDT 372.00 billion or US\$4.46 billion that accelerates the overall economic development process of the country. The Bangladesh government developed a framework, rules, and regulations for the smooth functioning of MFIs and established a regulatory body, which is known as Microcredit Regulatory Authority (MRA) [24]. MRA is the central body to monitor and supervise micro-finance operations of NGO-MFIs and to promote and foster sustainable development of the micro-finance sector in Bangladesh [25]. MRA ensures the enforcement of sanctions in the event of any MFI failing to meet the licensing and ongoing supervisory requirements.

This sector is basically financed by the different types of capitals: Savings collected from clients, cumulative surplus or profit, concessional loan received from government sources such as Palli Karma Sahayak Foundation (PKSF), grants received from national and international donors, and commercial bank borrowings. Initially, foreign donation was the major source of funds for these organizations, the contribution of which stood too near about 50% of the total fund until 1996. After 1996, it had declined sharply and became only 17% of the total fund in December 2001 as per Microcredit Regulatory Authority. Because of the declining trend of foreign donation, the MFIs-NGOs have concentrated on accumulating funds from internal sources, such as saving mobilization from their members. While the total fund increased significantly over time, there was only a little change in terms of the composition of the fund. The most important source of funds turned out to be clients' savings, which was the single most important source of capital. The cumulative surplus was the second most important source of funds. Loans from commercial Banks turned out to be the next most important one. Loans from PKSF, a micro-finance wholesale funding agency, also provides a large portion of loan funds at a subsidized rate. The least important source appeared to be grants from the donor agencies, as the previously donor driven NGOs are now trying to rely more and more on local sources of funds with the decline in foreign funding. Table 1 shows the evolution of sources of funds for MFIs in Bangladesh. Donor funds are declining, and loans from the commercial bank are increasing.

Table 1. Evolution of sources of funds for micro-finance institutions (MFIs) in Bangladesh (Billion in BDT).

Source of Funds	June, 2011	June, 2012	June, 2013	June, 2014	June, 2015	June, 2016
Clients' Savings	63.3 (34.46%)	74.99 (32.62%)	94 (33.63%)	107 (34.21%)	135.41 (33.94%)	170.46 (34.42%)
Loan from PKSF	31.77 (17.30%)	33.58 (14.61%)	34.07 (12.19%)	34.52 (11.04%)	37.77 (9.47%)	40.76 (8.22%)
Donors' Fund	7.01 (3.82%)	7.06 (3.07%)	7.1 (2.54%)	6.86 (2.19%)	5.22 (1.31%)	5.11 (1.03%)
Cumulative Surplus	50.3 (27.38%)	65.44 (28.47%)	83.26 (29.79%)	100.94 (32.28%)	137.71 (34.52%)	166.97 (33.67%)
Loan from Commercial Banks	23.58 (12.84%)	32.65 (14.20%)	42.7 (15.28%)	51.5 (16.47%)	68.57 (17.19%)	95.01 (19.16%)
Other Funds	7.73 (4.21%)	16.17 (7.03%)	18.39 (6.58%)	11.91 (3.81%)	14.24 (3.57%)	9.85 (2.02%)
Total:	183.69 (100%)	229.89 (100%)	279.52 (100%)	312.73 (100%)	398.92 (100%)	488.16 (100%)

Data source: Microcredit Regulatory Authority Database.

2.2. Micro-Finance Components

Microfinance is a package of several services including a small dollar value loan that MFIs provide to their clients. MFIs also provide human and social capital development services to their economically marginalized clients to help them succeed in their endeavors like social entrepreneurial ventures.

The clients of MFIs are basically poor, self-employed, low-income entrepreneurs performing their activities in their household. Their small businesses are focused on retail stores, street sale, handicraft production, agriculture, animal farming, and small production or different types of services. Most of the MFIs' clients are women with little or no formal education, but they are better than men at paying back loans. They tend to have a lower risk of having overdue loans than men [26].

Without collateral, poor people do not have access to a credit facility from the formal credit sources [23]. Microfinance Institutions provide credits through group or individual lending [27,28]. Individuals who have some level of security, such as their reputation among peers and society, and income sources, may get loans directly from MFIs [28,29]. Another way to provide loans is to create a small group of people who have a common wish of getting the same type of financial service. Usually, poor people organize themselves in small groups, and each participant accepts joint responsibility, which is called joint liability, liability for their own self and also for other members of the group, for the loan [27]. Some empirical studies show that self-selected groups perform better than groups selected by MFIs, as problems of under-investment may be ameliorated and repayment rates are also improved [30]. The poor also create a larger group, usually 30–100 members, which is known as the village banking model, and access loans for the group itself rather than for individuals [22].

The socio-economic, religious and cultural context in developing countries such as Bangladesh is not welcoming to social entrepreneurship headed by women. To make them successful social entrepreneurs, MFIs need not only to provide credit services, but also human and social capital development services [31]. MFIs such as Grameen Bank organize a weekly meeting of their members, help them to organize as a group, provide them training on socio-cultural and political issues that concern them, and motivate them to work together and become a social force.

3. Capital Structure and Sustainability of MFIs

As micro-credit has a significant role in poverty alleviation, it attracts a lot of attention both from policymakers as well as from academic researchers [13,32,33]. However, the studies [34,35] reveal that a large number of microfinance programs still depend on donor subsidized funds to meet the high costs collateral free delivery approach, as well as a high-interest rate called a "Poverty Penalty" paid by poor borrowers [36]. Moreover, MFIs' declining financial performances came to the attention to the need for examining the efficiency of MFIs [37,38]. Many skeptics consider that with commercial funds, the social objective of MFIs will be compromised [39]. At the same time, MFIs need to achieve financial sustainability, i.e., a status when their service, infrastructure level, and standards are delivered according to a long-term plan without the need to increase interest rates or reduce services. Sustainability of MFIs refers to economic viability [40]. NGO-turned-MFIs started to get better access to external capital as they shifted from donor-dependent, subsidized capital to private funding by attracting private investors as a part of their transformation into regulated institutions through commercialization [41]. Over the years, MFIs have started to collect the deposit from their clients, which allows the poor to be savings oriented. Moreover, MFIs provide the needed services to more poor clients, as well as lower the costs of capital by transforming into deposit-collecting institutions [42–44]. MFIs with access to donor funds may not have the pressure to make the profit; that is why they may deliberately choose outreach over efficiency by serving poorer or rural clients with higher delivery costs [16]. According to scholars [45–47], profit-driven loans from private sources can be more successful at achieving social objectives than money from the public, or tax-payer sources. The financing structure of the MFIs can also be categorized as liability financing and equity financing. Policymakers need to know the optimum mix of liability and equity financing for the MFIs. Depending on the sources of funds, each fund has different costs that contribute to the rate applied while lending loans to borrowers.

MFIs collect fund from diverse sources in order to create an optimum mix of funds that reduce overall cost. Again, commercial funds are necessary for the on-going expansion of the micro-finance services. According to the author of [48], the performance of MFIs is influenced by the interest of the stakeholders behind the capital. They used panel data from MFIs from Eastern Europe and used a seemingly unrelated regressions (SUR) method. They mentioned that the grants are helpful for better depth of outreach; concessional loans are useful for improving outreach without affecting financial results. Tchuigoua [49] found that creditors' rights and financial sector development of a country influence the level of external funds for MFIs. Thus, if the financial sector is on a well-established foundation and obeys the rules, MFIs will have more access to external funding, and they will be complementary to the classic financial sector.

To investigate the relationship between capital structure and profitability of listed firms on the Ghana Stock Exchange (GSE) during a five-year period, Abor [50] used regression analysis in the estimation of functions relating to the Return on Equity (ROE) with measures of capital structure. That study found a significantly positive relationship between the short-term debt ratio and profitability, and a negative relationship between long-term debt ratio and profitability. However, for the total debt, this study indicated a significant positive relationship between total Debt to Total Asset Ratio and profitability as Return on Equity (ROE) [50]. This research suggests that profitable firms depend more on debt as their main source of funds. Some other studies also provided empirical evidence supporting this positive relationship between debt level and a firm's performance [51]. On the other hand, there have been some other studies that have indicated empirical evidence of the negative relationship between debt level and a firm's performance [52–54].

Abor [52] analyzed the effect of debt policy or capital structure on the financial performance of small and medium-sized enterprises (SMEs) in Ghana and South Africa. Using various measures of performance, the results of this study indicated that capital structure, especially long-term and total debt ratios, negatively affect the performance of SMEs.

Abrar and Javaid [55] considered Return on Assets (ROA), Operational Self Sufficiency (OSS), and Return on Equity (ROE) as dependent variables to measure the profitability and Deposit to Asset, Net Deposits, and Debt to Equity ratio as independent variables, and number of women borrowers, size regulations, and age as control variables. This study used the random-effect-model to analyze cross-sectional unbalanced-panel data for the years of 2004–2010 of about seventy countries from all over the world. They found that deposit is the lowest cost financial source for MFIs. They also found that highly leveraged MFIs enjoy higher profitability relative to the less leveraged MFIs. MFIs with more women borrowers enjoy significantly higher profitability because of less default-risk. Generally, female borrowers have the tendency to pay regular loan repayments compared to males.

Bogan [56] studied the effects of capital structure on self-sufficiency and efficiency for a global sample of MFIs, and indicated that the size of an MFI's assets and an MFI's capital structure are associated with performance. It showed that the asset size of MFIs has an effect on sustainability, and outreach and grants as a percentage of assets are significant and negatively related to sustainability, but are positively related to MFI cost per borrower. Bogan [56] also found causal evidence supporting the assertion that increased use of grants by large MFIs decreases operational self-sufficiency. It emphasizes that the concept to use long-term grants may be related to inefficient operations due to a lack of competitive pressures associated with attracting market funding. Thus, grants could hamper the development of MFIs into competitive, efficient, sustainable operations.

Kar [57] studied the impact of capital and financing structure on the performance of MFIs with a large panel dataset using (GMM) and (IV) estimations, with the agency theory as a theoretical foundation. Kar [57] used ROA, ROE, and operating expenses per dollar lent (OELP) as indicators for financial performance and capital-asset ratio, debt-equity ratio, loan-asset ratio, and PAR30 as the indicators for capital structure, and found that an increase in leverage raises profit-efficiency in MFIs. However, Kar [57] concluded capital structure does not have any noticeable impact on the breadth of outreach.

Kyereboah-Coleman [58] used ROA and ROE as performance indicators, and total debt, short term debt, and long term debt as indicators for capital structure, and size, age, and risk level as control variables for a panel data of 52 MFIs from Ghana for a period of ten years from 1995 to 2004, applied fixed and random effects techniques, and found that most of the MFIs are highly leveraged, and these MFIs use more long term debt than short term debt. The study also found that highly leveraged MFIs perform better by reaching out to more clientele, enjoy scale economies, and are therefore better able to deal with moral hazard and adverse selection [58].

Dorfleitner, Rohe, and Renier [59] found the positive relationship between the maturity of the MFIs and access to debt capital. Because of organizational form and the legal environment in the country, many MFIs are not permitted to collect deposits and are therefore forced to rely on alternative sources of funding; for example, borrowings from micro-finance investment vehicles (MIVs). Dorfleitner, Rohe, and Renier [59] examined a worldwide data set for the years 2007–2010 and used ROA and portfolio at risk as financial performance, and the size of the MFI and the Debt to Asset ratio as independent variables. Furthermore, they found that MFIs with a solid financial performance in terms of portfolio quality exhibit better access and suggested that MFIs maintaining their social mission experience easier access to funding from MIVs. Contrary to Dorfleitner, Rohe, and Renier [59]; Abrar and Javaid [55], and Pati [60] did not find the relationship between age and higher profitability of MFIs. Moreover, Pati [60] found the profitability of the MFIs allows them to have access to cheaper debt financing by issuing bonds/debentures instead of institutional sources such as formal banks. For example, the interest rates in developing countries are relatively high compared with other developed countries. Hartarska, Shen, and Mersland [61] show that the larger MFIs are more cost-effective due to the advantages afforded by potential economies of scale and potential scope economies between deposits and loans. MFIs with higher nonperforming loans require more resources to manage the higher risk [62]. Because of this lower asset quality, they face challenges to achieving outreach and sustainability.

The current literature on this field is heterogeneous in terms of their definition of capital structure and profitability, i.e., economic sustainability of MFIs. These are focused on the determinants of financial structure to explain how an MFI can finance business activities by using debts and equities to maximize the benefits for shareholders based on their advantages. What is missing from the literature is the inquiry that addresses the effects of the financial structure of MFIs on their performance. The heterogeneous aspects of MFIs also need to investigate the relationship between microfinance funding structure and financial performance/sustainability as well as social outreach and depth versus breadth of microfinance services. Studies emphasizing on the linkage between capital structure and performance in MFIs have been few. Despite the fact that Bangladesh has more MFIs than many other countries, no study has specifically focused on the capital structure and performance of MFIs from Bangladesh.

4. Methodology

4.1. Empirical Model

This study attempts to examine the effect of capital structure on micro-finance institutions performance by investigating the relationship between the observed performance indicators and a set of explanatory variables using multiple regression methods. That is, the study focuses on the source of funding of the MFIs and their relative profitability. The performance of MFIs is measured by Return on Asset (ROA) and Net Income to Expenditure (NIER), and these two variables are used as dependent variables, which are related to the profitability as well as sustainability. Independent variables include Equity Asset Ratio (EAR) Debt to Loan (DTL), Deposit to Loan Ratio (DETL), and Deposit to Asset Ratio (DAR). Moreover, it considers two control variables, which are Risk and Size. Some explanatory variables could be endogenous. To address the endogeneity issue 2SLS and 3SLS models are usually used with the help of instrumental variables. Unfortunately, this data set did not have credible instruments to use. In the case of panel data, the fixed-effect model and the random-effects model

are commonly used. Panel data are multi-dimensional, which contain observations of many firms or individuals over a period of time. Panel data can take an explicit account of individual-specific heterogeneity, gives more data variation, less collinearity, and more degree of freedom. It is considered better in detecting and measuring the effects than other methods. Many studies [50,52,55,58,59] used panel data to determine the relationship between capital structure and financial performance.

The following hypotheses have been developed and will be tested:

- H1.** *Highly debt-financed micro-finance institutions are expected to be more sustainable and profitable.*
- H2.** *Higher Deposit to Loan Ratio micro-finance institutions are expected to be more sustainable and profitable.*
- H3.** *Large-scale micro-finance institutions are expected to be more sustainable.*
- H4.** *Highly risked micro-finance institutions are expected to be less sustainable.*

4.2. Data

This study has used an unbalanced panel data of 187 MFIs in Bangladesh, which are collected from The Institute for Inclusive Finance and Development (InM), a non-profit research organization in Bangladesh that gathers data in collaboration with UK donor agency funded projects. It is a well-respected organization that collects empirical household data from micro-finance institutions and clients. This data set contains a period of ten years of data from 2005 to 2014. Each MFI has data for a minimum of three years and a maximum of ten years. The same dataset has been used for other research and thus can be considered as reliable. All numbers in the dataset are in BDT currency. In this study, STATA-15 has been used for data analysis. The effect of capital structure on MFIs performance has been identified using “Multiple Regression Analysis” with the numerical data.

In this study, profitability or sustainability of an MFIs is measured by Return on Asset (ROA) and Net Income to Expenditure Ratio (NIER). ROA measures how well an MFI uses its total assets to generate income. NIER describes how well an MFI can cover its costs through financial and operating income. For example, $\text{NIER} \geq 0$ implies MFIs are sustainable, and $\text{NIER} < 0$ implies MFIs are not sustainable. Different models are used to find the answers to the above-mentioned research questions in this study.

4.2.1. Specification of Variables

Debt: Debt of MFIs is the money borrowed for short-term or long-term from other financial institutions, which an MFI must pay back to lenders with interest after a specific agreed upon period of time. Due to a lack of enough internal funds or equity, MFIs use borrowed money to expand their businesses. If an MFI is well established and has steady return and profitable growth, it tends to rely more on debt financing to fund their businesses.

Deposit: Deposit of MFIs refers to the sum of savings deposited by their members. There are two types of deposits: Voluntary deposits and compulsory deposits. Voluntary deposits refer to the savings deposited voluntarily by the members when members of MFIs are solvent enough to make some savings at the market-driven interest rates and can withdraw their savings any time. Compulsory savings refer to a sum of money which borrowers must save at regular intervals with MFIs as a condition for receiving a loan. These savings are considered as collateral and used to cover missed payments. The borrower can withdraw these savings after repayment of the loan.

Loan: Loans of MFIs are the money that their borrowers must pay back with interest. Generally, this microcredit or loan is paid on a weekly basis. In accounting, a loan is considered as the asset of the firm. For MFIs, the loan is the major part of the asset, sometimes up to 99%. Usually, MFIs don't have any other types of assets.

Equity: Equity of MFIs is the money received from the current owners or potential investors to finance business activities. According to Chasnow and Johnson [63], there are two types of investors: Social investors and commercial investors. First, social investors invest with social objectives as a high

priority and commercial investors or private-equity funders focus more on financial returns from their investments. In Bangladesh, members of some MFIs are considered as the shareholders or owners of the MFIs.

Dependent Variables

Return on Asset (ROA): ROA measures how well the institution uses its assets. It reflects the profit margin as well as the efficiency of the institutions. ROA is widely accepted and used in several studies to measure the financial performance of Banks and other financial institutions. Several authors [57,58,64] used ROA as an indicator of financial performance in their studies. ROA is measured as follows:

$$ROA = \frac{\text{Net Income}}{\text{Total Asset}}$$

Net Income to Expenditure Ratio (NIER): NIER measures net operating revenue as a percentage of operating and financial expenses. It counts all the cash costs of running a firm, loan loss provision, and depreciation. It describes how well MFI can cover its costs through financial and operating income. NIER is calculated as (revenue and income are used as synonymous):

$$NIER = \frac{(\text{Total Revenue} - \text{Total Expenses})}{\text{Total Expenses}}$$

where, revenue and income are used synonymously.

Independent Variables (Measure of Capital Structure)

The explanatory (independent) variables in this study are Equity to Asset Ratio (EAR), Debt to Loan Ratio (DTL), Deposit to Loan Ratio (DETL), and Deposit to Asset Ratio (DAR). These four ratios serve as a proxy for capital structure.

Equity to Asset Ratio (EAR): Equity to Asset Ratio (EAR) indicates the proportion of a firm's total equity contributed to its operation. EAR is measured as:

$$EAR = \frac{\text{Equity}}{\text{Asset}}$$

Debt to Loan Ratio (DTL): The Debt to Loan ratio measures the amount of funds borrowed by the firm in relation to its loan. If the use of debt is increased, it will lead to a higher Debt to Loan Ratio. DTL is calculated as:

$$DTL = \frac{\text{Debt}}{\text{Loan}}$$

Deposit to Loan Ratio (DETL): The Deposit to Loan Ratio measures the members saving or deposit of the firm in relation to its loan. DETL is calculated as:

$$DETL = \frac{\text{Deposit}}{\text{Loan}}$$

Deposit to Asset Ratio (DAR): The Deposit to Asset Ratio is a common ratio which measures the amount of deposits of the firm in relation to its assets. Deposit to Asset Ratio is comparatively highly relevant for the MFIs which mobilize the deposits. DAR is calculated as:

$$DAR = \frac{\text{Deposit}}{\text{Asset}}$$

Control Variables

Apart from the capital structure, there are several other factors that may have an impact on MFIs performance, therefore control variables are included in the model. This study considers two control variables, which are Size and Risk.

Size: This study has included Size as one of the main independent variables in all regressions and defined as the natural logarithm of total assets to control the effects of diversification and differences associated with MFIs. Economies of scale is an important concept in economics; therefore, the size of a firm is considered an important determinant of a firm's performance. Larger, well-known firms may have better access to the long-term capital market. Whereas, smaller unknown firms arrange short-term funding.

$$\text{Size} = \log(\text{Total assets})$$

Risk: It has been hypothesized that MFIs are not careful in risk management. As a result, they may have more default loans, which are considered as a risk of the MFIs. So, the risk is a measure of the quality of the portfolio, and it has a negative effect on profit, efficiency, and performance of the MFIs. In this study, risk is defined as a ratio of loan provision to outstanding loans of MFIs, which indicates how well the MFIs are collecting their loans and also the proportion of the provision amount against default loans to total outstanding loans.

$$\text{Risk} = \frac{\text{Loan provision amount}}{\text{Total outstanding loans}}$$

5. Data Analysis

5.1. Descriptive Statistics

Table 2 shows the descriptive statistics of both dependent and independent variables, and Table 3 shows the proportion of NIER and ROA of MFIs, where about 84% of MFIs has ROA greater than zero, and mean value of ROA is about 2.72%. The standard deviation score of NIER is 1.26, and the spread of minimum and maximum values is from −0.84 to 46.15 with a mean value of 0.24. If the proportion of MFIs is considered, only 0.33% of MFIs have a NIER of more than 5, which affects the mean of NIER. However, 83.13% of MFIs have a NIER of more than zero, and 16.87% have a NIER of less than or equal to zero. The mean of Deposit to Asset Ratio is 43%, and Equity to Asset ratio is 16%. Most of the MFIs are highly leveraged, shown by the mean DTL of 64%. Again, the mean of DETL is 60%. The average default rate in terms of provision of default loan to total loan is about 1.7%.

Table 2. Descriptive Statistics.

Variable	Obs	Mean	Std. Dev	Min	Max
NIER	1535	0.2370705	1.264884	−0.8430468	46.15266
ROA	1545	0.0272149	0.0925431	−0.7981663	1.87372
DAR	1545	0.4265337	5.948581	0	234.0478
EAR	1073	0.1631065	0.1604394	−1.052481	0.7474034
DTL	1563	0.6362096	1.128827	0	29.05021
DETL	1551	0.5959346	8.301851	0	325.681
Risk	1563	0.0172511	0.0467612	−0.0369679	1.398942
Size	1547	18.52943	1.885723	12.41364	25.27294

Table 3. Proportion of MFIs' observations and level of Net Income to Expenditure (NIER) and Return on Asset (ROA).

	No. of Observations	Percentage (%)
NIER ≤ 0	259	16.87%
NIER > 0 to <5	1271	82.80%
NIER > 5 to <10	4	0.26%
NIER ≥ 10	1	0.07%
Total	1535	100.00%
ROA ≤ 0	251	16.25%
ROA > 0 to <5	1294	83.75%
ROA > 5 to <10	0	0.00%
ROA ≥ 10	0	0.00%
Total	1545	100.00%

Correlation matrix between NIER, ROA, independent variables, and control variables.

Table 4 indicates the correlation matrix for all the variables in the regression model. The values are spreading from -1 to 1 , which are known as Pearson Correlation coefficients. A value close to 1 means having a strong correlation and negative value indicates an inverse relationship, that means when one increases, the other decreases.

Table 4. Correlation Matrix between NIER, ROA, independent and control variables.

	NIER	ROA	DAR	EAR	DTL	DETL	Risk	Size
NIER	1							
ROA	0.6885	1						
DAR	−0.0048	−0.0065	1					
EAR	0.2881	0.2284	0.1366	1				
DTL	0.0220	0.0764	−0.0028	−0.1214	1			
DETL	−0.0013	−0.0022	0.9950	0.0689	0.0579	1		
Risk	−0.0792	−0.3756	−0.0038	−0.0041	−0.0009	−0.0039	1	
Size	0.0359	0.0658	−0.0816	−0.0190	0.0354	−0.0828	−0.0456	1

The correlation between Deposit to Asset Ratio (DAR) and Deposit to Loan Ratio (DETL) is 0.995. DAR and DETL are almost the same in the case of MFIs as the loan is the major part of the asset for most of the landless poor clients of MFIs. That is why, at the time of regression, DAR was excluded to measure the impact of the independent variable on NIER. Again, DETL was excluded to measure the impact of the independent variable on ROA, as DAR and DETL are almost the same.

5.2. Regression Results

The study utilizes unbalanced panel data of different MFIs of Bangladesh for a period of ten years from 2005 to 2014. As all the data are from MFIs of Bangladesh, the operating environment is the same for all MFIs. Table 5 presents the regression results, showing the effect of different measures of capital structure on Net Income to Expenditure Ratio (NIER).

Table 5. Regression results of NIER as dependent variable. EAR: Equity to Asset Ratio; DTL: Debt to Loan Ratio; DETL: Deposit to Loan Ratio.

Independent Variable	Random Effect Model			Fixed Effect Model		
	Coefficient	Std Error	p-Value	Coefficient	Std Error	p-Value
EAR	0.6519422	0.0849522	0.000	0.2113232	0.1166586	0.070
DTL	−0.0404781	0.0116809	0.001	−0.122877	0.0116693	0.000
DETL	0.0215626	0.0148351	0.146	0.0942912	0.0144173	0.000
Risk	−1.89085	0.2242217	0.000	−2.006688	0.2106253	0.000
Size	0.0149981	0.0075153	0.046	0.0193064	0.0217192	0.374
Wald chi2 (5)		159.36			329.90	
Prob > chi2		0.00			0.00	

The NIER describes how well MFI can cover its costs through its income. As per regression results, Equity to Asset Ratio (EAR) has a positive and significant impact on NIER with a *p*-value of 0.000 under the Random effect model. When EAR is increased by 10%, NIER is also increased by 6.52%. On the other hand, under Fixed effect model, EAR positively affects NIER, but it is not significant at 5% level.

Again, Deposit to Loan (DETL) also has a positive relation with NIER. However, it is not significant under the Random effect model. Though, under the Fixed effect model, the regression result is significant, with a *p*-value of 0.000. Size shows positive and significant influence on NIER under the Random effect model. The implication is that when Size is increased by 10%, NIER is increased by 0.15%. While Risk, as expected, has a negative effect on NIER. and it is significant, with a *p*-value of 0.000 under both models. The NIER is decreased by 18.91% and 20.07% when Risk is increased by 10% under the Random effect model and the Fixed effect model, respectively.

Debt to Loan Ratio (DTL) has a negative significant impact on NIER under both models, which is contrary to the expectation. When DTL is increased by 10%, NIER is decreased by 0.40% under Random effect model. Among all these variables, EAR and Risk are most important because they have more impact on NIER.

ROA indicates profitability as well as the efficiency of MFIs. The regression results using Return on Asset (ROA) as the dependent variable to measure the performance of MFIs and EAR, DTL, and DAR as a measure of capital structure are presented in Table 6 using the Random effect model and Fixed effect model. Results show EAR and Risk have a strong impact on ROA compared to DTL, DAR, and Size.

Table 6. Regression results of ROA as dependent variable.

Independent Variable	Random Effect Model			Fixed Effect Model		
	Coefficient	Std Error	p-Value	Coefficient	Std Error	p-Value
EAR	0.1108284	0.0136441	0.000	0.067849	0.0242801	0.005
DTL	0.0039397	0.0017446	0.024	0.0031973	0.001969	0.105
DAR	0.0152798	0.0185971	0.411	0.0229454	0.0355431	0.519
Risk	−0.6457785	0.0406714	0.000	−0.6403198	0.0442438	0.000
Size	0.0021729	0.0011617	0.273	−0.0034844	0.0045779	0.447
F		47.89			44.13	
Prob > F		0.00			0.00	

Estimation identifies EAR as having a significantly positive effect with a *p*-value of 0.000 on ROA, which supports that the more the assets are financed through equity, there is more profitability. When EAR is increased by 10%, ROA also is increased by 1.11% under the Random effect model. The same positive and significant result is also observed under the Fixed effect model.

It is also identified that Risk has a significant negative impact on the ROA, which supports the hypothesis that an increased risk leads to a decrease in profitability. When Risk is increased by 10% under the Random effect, ROA is decreased by 6.5%.

DTL has a positive significant relation with ROA, but its effect is relatively small. When DTL is increased by 100%, ROA is increased by 0.4% under the Random effect model. DAR has a positive impact on return on asset, but it is not significant under both Random Effect Model and Fixed effect Model. Like DAR, size also has a positive effect on ROA, but is not significant under Random effect model. Under the Fixed Effect Model, EAR, DTL, DAR have positive relations on ROA and Size, and Risk has a negative relation. All results are significant except for DAR and Size.

The whole dataset is divided into two sub-samples based on means of assets to observe if results vary. Sub-sample results do not show very different results from the whole sample results.

Hausman test between Random effects and Fixed Effects

$$\text{Chi2 (5)} = (b-B)' [(v_b - v_B)^{-1}] (b-B)$$

$$= 1113.16$$

$$\text{Prob} > \text{chi2} = 0.0000$$

($v_b - v_B$ is not positive definite)

It describes that Random effect model is better than Fixed effect model.

5.3. Discussion

Findings show that Equity to Asset Ratio (EAR) has positive and significant effects on both NIER and ROA. It is one of the important findings, which suggests a preference for equity-based financing at the time of making the decision about capital structure.

Risk of the MFIs, measured as the proportion of the provision amount against default loans to total outstanding loans, has a negative and significant effect on both operational efficiency and profitability. This is consistent with the hypothesis H4. This finding suggests that reducing risk can decline costs and improve the financial performance significantly as MFIs with higher nonperforming loans require more resources to manage the higher risk [62].

Size has a positive and significant influence on operating performance of MFIs under Random effect model that relates to Bogan [56]. However, Size has a positive, but nonsignificant, impact on profitability. This finding is reasonable, as there are fixed and variable expenditures of MFIs that can be influenced by the Size of the organization.

Deposit to Asset Ratio (DAR), which is used to measure the proportion of the assets financed by savings positively impacts on ROA under Random effect model, but it is not significant. Again, Deposit to Loan (DETL) also has a positive relation with NIER, but not significant. Though, many MFIs use internal savings during the financial crises to solve the liquidity problems as savings has a relatively low cost of funds [55,65].

This study also found that Debt to Loan Ratio (DTL) has a positive and significant impact on ROA under the Random effect model, which is consistent with several authors [55,57–59]. However, DTL has a negative and significant effect on NIER. This finding is consistent with the previous studies such as Abor [52]; Cassar and Holmes [53]; and Gleason, Mathur, and Mathur [54]. Reasons for being negative are: First, investors do not have confidence in getting the return of their invested amount, which is why they charge high interest to MFIs, which increases the operating cost of MFIs. Second, institutions depend on more leverage to avoid agency conflicts, thus, this overleveraging negatively affects institution performance [54,66]. Finally, MFIs could be employing debt excessively, which is likely to result in high bankruptcy cost, which could negatively affect performance [52]. Both findings of DTL indicate that debt has a negative impact on an institution's operation, but a positive impact on profitability. So, top managers of MFIs need to understand how they can compose their capital structure with both equity and debt so that the MFI might have a positive outcome or performance.

5.4. Study Contributions

The study contributes to financial governance of MFIs in several ways. First, capital structure theory is principally used in the corporate finance area of classic firms. Despite the differences in terms of objectives and operating modes of micro-finance institutions (MFIs), this study has used the similar theoretical principles to analyze the capital structure and performance and found plausible results. Second, the impact of market-based financing on performance, which is a commonly used financing mode of MFIs now-a-days, is different from the usual belief that MFIs can only survive if they are financed by donor funds. Market-based financing and obligations to pay back the borrowed money encourage the MFIs' managers to find innovative ways to deliver their service, keeping in mind that the invested capital needs to be recovered and paid back to borrowers with interest. This pressure improves the productivity of MFIs which are currently dependent on market-based financing. Third, this study introduced the impact of size and risk of bad loans on the sustainability of MFIs. It found that size has a positive correlation with ROA, whereas risk has a negative correlation with ROA. It indicates that MFIs with less risk in terms of default loan enjoy more profitability and remain more sustainable, as well as the size of the MFIs, in terms of their assets, also lead to higher profitability and sustainability. Our results corroborate with Abrar and Javaid [55] despite the difference of using different types of datasets. Fourth, this study analyzed the operating self-sufficiency in terms of net income to expenditure. This is an indicator that is developed here and describes the extent to which the cost of operations of MFIs can be covered by their own income.

Finally, the study contributes to a better understanding of how the capital structure affects the performances of financial sustainability. Policy makers may be able to adequately decide the capital structure based on the objective of their micro-finance services, proving that commercial micro-finance services can be viable. They may be able to raise funds from internal savings, equity, and commercial sources such as banks, capital markets, etc., and create the economy of scale. They will also be able to serve more poor clients and contribute both to financial sustainability, and to societal development. As micro-finance continues to evolve both in depth and breadth, an adequate financial structure of the MFIs is needed to provide relevant and useful services to the poor. Overall results lead to the implication that MFIs should properly use capital funds like debt and equity to attain sustainability and profitability. In brief, our study demonstrates the use of capital structure theory in a different context of MFIs. It also shows how MFIs can develop their capital structure from different sources of fund including from the commercial sources.

5.5. Limitations and Future Research

This study used secondary unbalanced panel data of 187 MFIs from Bangladesh. This dataset contains most of the important MFIs including BRAC, ASA, PKSF, and BURO Bangladesh, but excludes one of the most important MFI: Grameen Bank. Consequently, the data has a certain sample selection bias. There were also some missing data in the dataset.

The dependent variable of the regression model may influence some of the independent variables. As a result, they may have an endogeneity problem. To address the endogeneity problem, usually an instrumental variable technique is used. Unfortunately, this dataset does not have variables which can be used an instrument variable technique.

Performance of MFIs can be measured in several ways using different variables. This study only considered four independent variables, two control variables, and two dependent variables: Return on Asset (ROA) and Net Income to Expenditure Ratio (NIER) as performance measures of MFIs. Further studies could include more or different dependent, independent, and control variables. This study only considered the financial performance of MFIs of Bangladesh and did not consider social performance. Further studies can be recommended to analyze the effect of capital structure on both financial and social performance of MFIs in Bangladesh.

6. Conclusions

This study attempts to examine how capital structure affects the financial performance of MFIs. The study used the fixed-effect and random effect model to analyze panel data of 187 MFIs of Bangladesh collected from a secondary source. Results show that there is a positive and significant effect of EAR and negative, but significant, effect of DTL on operating performance of MFIs from Bangladesh. It implies a preference for equity-based financing over debt-focused financing. It is also found that Size does have a positive significant impact on NIER. This finding is plausible as there are many fixed and variable expenditures related to the Size of the organization which may influence their operational performance. Risk as the proportion of the provision amount against default loans to total outstanding loans has a negative and significant influence on both operational efficiency and profitability. Overall, all these findings contribute to improving the understanding of the capital structure of MFIs in Bangladesh and how it relates to performance and sustainability. This improved understanding could enable policymakers to develop a balanced capital structure for MFIs following the extent of individual capital source's contribution to performance and sustainability. A well configured capital structure will help to achieve both MFIs performance and outreach, and can contribute to achieving the SDG goals such as poverty alleviation, human sustainable development, and corporate social responsibility.

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