

THE STIMULUS OF MICROFINANCE INSTITUTIONS FINANCIAL SELF RELIANCE IN BANGLADESH: A PANEL DATA ANALYSIS



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ARTICLE INFO

Article History:

Received: 30th June 2022

Accepted: 10th August 2022

Online Publication: 13th August 2022

Keywords:

Microfinance, Financial Self-Reliance
Stimulus

JEL Classification Codes:

G21, C23

ABSTRACT

Microfinance is the concession of providing comprehensive financial services to unbaked rural people. It has become an empirically proven tool to fight against rural poverty in developing countries like Bangladesh. The performance of MFIs in the improvement procedure of an economy is impressive. In this study, researchers purposively select sixty (60) microfinance institutions as a sample and incorporate five years of panel data from 2015 to 2019. Researchers use return on assets (ROA) as a proxy of financial self-reliance, whereas size, experience, managerial efficiency, the breath of outreach, and depth of outreach are explanatory variables. For analyzing data, researchers employ Stata 12 software, and ordinary least square and fixed effect models are also used for assessing the stimulus of MFIs' financial self-reliance. The study revealed that size, experience, managerial efficiency, the breath of outreach & depth of outreach are explained by 73.75% variation of the dependent variable, i.e., financial self-reliance of MFIs in Bangladesh, which is statistically significant at a 1% level. Researchers outlined that size, experience, managerial efficiency, breadth of outreach, and depth of outreach are this study's statistically substantial stimulus for sample MFIs.

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INTRODUCTION

After the covid-19 pandemic, poverty goes to an intense level in the developing & least developing countries on this earth. A lot of people lost their ongoing jobs, and most of the small & medium enterprises discontinued their operations, contributing to extending poverty worldwide. Microfinance is an empirically proven tool to fight against poverty, especially in the rural area. The prime issue behind microfinance is to afford desired financial services such as deposits, credit, fund transfer, payment, micro-insurance, etc., to economically active rural landless people who are excluded from formal financial channels. Microfinance is the concession of a wide range of monetary facilities such as microcredit, deposits, remittance of the fund, disbursement services & coverage to unprivileged small-income households, and micro ventures (Asian Development Bank, 2000). Microfinance refers to the endeavor to promote access to small-scale deposits and microloans for low-income families ignored by the formal banking system (Schreiner & Colombet, 2000). It affords energy to magnify the financial activities of the low-paid community and thereby contribute to getting rid of their impoverishment (Abdishakur, 2020). Yields driven by microfinance is remarkably crucial for millions of uncollateralized poor community who are excluded from formal financial channels. Thousands of deprived people get access to basic financial services due to microfinance.

Microfinance institutions are specialized financial institutions that offer small loans or micro-credit to bottom-line people and microenterprises needing financial instigation to commence their business venture. MFIs are specially designated financial entities integrated under the flag of microfinance, ensuring operation for financial inclusion (Morduch, 1999). The main intention of microfinance institutions is to minimize poverty beginning with economically active poor rural landless people. Still, they have to ensure a significant amount of proceeds for survival in the long run. As most MFIs are operated based on donations, grants, aid, and subsidies, the self-reliance of MFIs has raised anxiety. At this moment, financial self-reliance becomes an utmost challenge for MFIs due to increasing outreach. Because of some unavoidable situations, MFIs are in intense trouble to reduce their reliance on donations, aid, grants, subsidized funding, and other external financial

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<https://doi.org/10.46281/ijafr.v11i1.1781>

sources. In that circumstance, for providing long-term financial services to vulnerable people, MFIs should achieve self-reliance, deriving adequate earnings from meeting financing and operating expenses. Financial self-reliance refers to the capacity to make up all expenses from generated revenue and thereby contribute to financing growth. The financial self-reliance of an MFI is the capability to run out its operations without relying on subsidies through concessional credit or grants. The financial self-reliance of MFIs is the capacity to handle microfinance's mission without any donor's aid (Dunford, 2003). Self-reliance is the strength of an MFI to stay on its own feet economically following a span of operations. The success of microfinance relies upon the financial self-reliance of MFIs. For MFIs, financial self-reliance is the crucial status for organizational viability (Hollis & Sweetman, 1998). Thus, it is insisted that financially weak MFIs might assist poor people today instead of tomorrow due to their insolvency (Schreiner, 2000). Presently, the robust challenge of any MFI is becoming self-reliance while expanding its outreach.

Owing to certain inescapable incidents, MFIs are in tremendous coercion to lessen their reliance on external financial resources like subsidized funding, grants, etc. There are, at best, two dimensions for analytically examining the progress of microfinance in Bangladesh. The first one is to evaluate the influence of microfinance on target customers, and the second is to measure microfinance institutions' financial performance (Janda & Turbat, 2013). This study enriches the current literature on the financial self-reliance of MFIs in Bangladesh in different ways. Firstly, it incorporates data from 2015 to 2020, which are not included in previous studies for measuring financial sufficiency and identifying its determinants in the context of Bangladesh. Secondly, return on assets (ROA) is employed as a proxy of financial self-reliance, covering both profit margin and efficiency of MFIs. ROA is the fundamental and approximate measure of the financial performance of MFIs (Gaul, 2011). Thirdly it includes strong balance panel data set to fulfill the objective of this study. Finally, it covers both firm-level and country-level determinants of the financial performance of the sample MFIs in Bangladesh.

Microfinance in Bangladesh

Bangladesh is the pioneer in addressing micro-credit in this world during the 1970s. Approximately Bangladesh's first microcredit issue can be detected from the Comilla BARD model of 1971, which Akter Hameed Khan launched during the 1950s. Later modern microcredit concept was addressed by Professor Mohammad Yonus through the Grameen Bank model in 1983. At present, microcredit is extendedly operated as microfinance in Bangladesh as well as all over the world. Over the phase of time, microfinance has become a popular mechanism for the upliftment of the economy not only in Bangladesh but also in developing countries in this world. At the very outset, NGOs provide microcredit facilities to unbanked communities in our country.

In contrast, per Bangladesh bank instructions, formal and semi-formal financial institutions are compelled to provide microcredit facilities to poor people. Four financial institutions facilitate micro-finance or small-scale financial services to marginal people in Bangladesh. These are – 1) Member based unique financial institution (Grameen Bank), 2) NGOs (Non-government organizations) like namely ASA, BRAC, BURO-Bangladesh, TMSS, Codec, SSS, etc. 3) Government-owned commercial & Specialized banks like Sonali Bank, Agrani Bank, Bangladesh Krishi Bank, Rajshahi Krishi Unnayan Bank together with 4) State financing microfinance projects such as BRDB, RD-12 and many more.

Through Bangladesh's long successful history of microfinance, there was no competent authority for structuring the microfinance industry before 2006. After three decades, in 2006 government of Bangladesh formed Microcredit Regulatory Authority under Microcredit Regulatory Authority Act -2006 for a suitable and vigorous environment in the microfinance sector. As a regulatory authority, MRA co-operates with NGOs to smoothly conduct microfinance activities to eliminate poverty and promote sustainable economic development. As per the microcredit regulatory authority (MRA), 746 registered microfinance institutions operate their activities among poor people in Bangladesh (MRA, 2021). According to the microcredit authority, with the help of 20,955 branches, these registered NGO MFIs served 3.52 core clients across the country, where the loan portfolio is Tk. 889 billion, and savings volume is Tk. 490 billion. Besides this, it is observed that approximately 200,000 people are engaged as staff over these NGO MIFs. Besides the commercial banks and other formal financial institutions, NGO MFIs effectively contribute to the sustainable economic growth of Bangladesh. As a part of financial inclusion, the microfinance sector plays a significant role in providing financial services among unbanked communities in developing economies like Bangladesh.

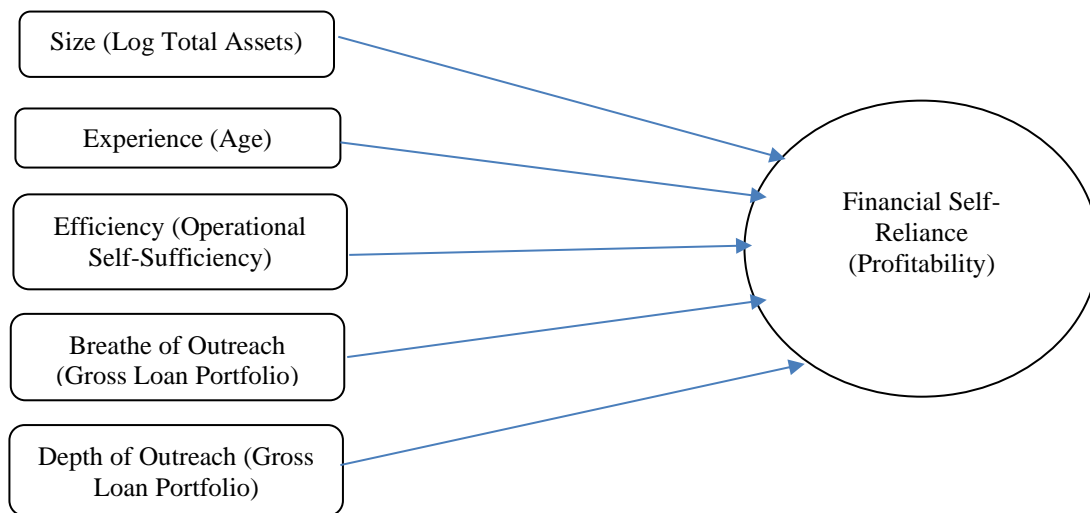
LITERATURE REVIEW

This part describes the literature on the financial self-reliance or financial sustainability of MFIs in Bangladesh and other foreign countries. The literature review facilitates tracing the research gap and thereby contributes to an unfolding framework for the study.

Kyereboah-Coleman and Osei (2008) examined 52 Ghanaian MFIs to assess their performance characteristics. The study incorporates 10 years of data from 1995 to 2004. Researchers found that board size, board independence, board competence, size, age, and asset structure are statistically significant determinants of studied MIFs in Ghana. Ayayi and Sene (2010) studied 217 MFIs in 101 countries to identify the relevant indicators of financial self-sufficiency. The study included 9 years of panel data from 1998 to 2006. Researchers found that portfolios at risk adversely and financial revenue ratios, management, productivity age & outreach had a favorable impact on the financial self-sufficiency of chosen MFIs in 101 countries. Al Atoom and Abu Zerr (2012) investigate the factors affecting the financial sustainability of Jordanian MFIs. The study includes cross-sectional data from 2011. Researchers revealed that financial revenue and financial expenses, operating expenses & provision for loan impairment negatively regressed on financial sustainability sample MFIs that were statistically significant. Dissanayake (2012) studied the determinants of microfinance profitability in Sri Lankan Microfinance Institutions. This study incorporates 11 MFIs as the six-year sample (2005 to 2010) panel data. The researcher applied multivariate regression for analyzing data. From this study, the researcher finds out that operating expenses ratio,

personal productivity, cost per borrower, and debt-equity ratios are the significant profitability determinants of Sri Lankan Microfinance Institutions. Muriu (2012) assessed the determinants of profitability of 210 MFIs in 32 different African countries. In this study, the researcher includes 12 years of unbalanced panel data from 1997 to 2008. The researcher expressed that efficiency, size, level of equity, and credit risk negatively impact sample MFIs which are statistically significant. Rahman and Mazlan (2014) investigate the determinants of financial self-sufficiency of 5 MFIs in Bangladesh. This study incorporates only 7 years of data from 2005 to 2011. The researchers exposed that size, age, and operating expense ratios are significant determinants of sample MFIs in Bangladesh. Loan and Nguyễn (2015) studied on financial performance and outreach of 97 MFIs in India. Testing cross-sectional data of 2010, researchers assess the determinants of financial performance and outreach of sampled MFIs. Researchers found that yield, operating & financial cost & loan to asset ratios are statically significant determinants of financial performance as well, as yield, operating & labor cost are statically important ingredients of the outreach of studied MFIs in India. The study also revealed that there is no arbitration between financial performance & outreach of MFIs in India, which means it may be attainable to greater outreach financially feasible. Hossain and Khan (2016) examine the financial sustainability of MFIs in Bangladesh. This study incorporates unbalanced panel data set of 29MFIs for five years from 2008 to 2009. Here researchers find that the capital assets ratio, operating expenses, and write-off ratio are statistically sizeable on the financial sustainability of chosen MFIs in Bangladesh during the studied period. Adhikary and Papachristou (2017) studied 114 MFIs in six south Asian countries (Afghanistan, Bangladesh, India, Nepal, Pakistan, and Sri Lanka) to assess profitability determinants. This study incorporates nine years unbalance panel data from 2003 to 2011. Researchers revealed that efficiency, credit risk, liquidity, percentage of women borrowers, and equity to total assets ratios are statistically significant determinants of sample MFIs in the study period. Khan, Butt, and Khan (2017) investigate the factors affecting the financial self-sufficiency of 32 MFIs in three countries (Bangladesh, Pakistan, & India) to pick out the factors that are infecting the financial self-sufficiency of MFIs in Pakistan, India, and Bangladesh. Five years of longitudinal data are incorporated in this study from 2011 to 2015. The researchers found that size & loan portfolio to assets ratios have a significant positive impact, as well as operating cost, managerial inefficiency, portfolio at risk & breath of outreach, which has a statistically significant adverse impact on the financial self-sufficiency of sample MFIs in three countries (Bangladesh, Pakistan, & India). Abdishakur (2020) explored the determinants of 4MFIs profitability in Addis Ababa, Ethiopia. The researcher considers 14 years of panel data from 2005 to 2018. This study revealed that the number of borrowers, portfolio quality, capital to assets ratio, age, and operational efficiency are firm-level significant determinants. The inflation rate is the country-level determinant of sample MFIs in Addis Ababa, Ethiopia. Parvin et al. (2020) studied 187 MFIs in Bangladesh to determine the impact of financial structure on financial performance. Researchers encompass 10 years unbalance panel data from 2005 to 2014. The study revealed that risk, size equity to asset ratio, and debt to loan ratio significantly dominate the financial performance of chosen MFIs in Bangladesh.

Following the theoretical model, the researcher developed a rigorous survey of existing literature on the study topic.



Source: Developed by the researcher from existing literature

MATERIALS AND METHODS

Methodology of the Study

Research methodology is a systematic process of solving a research problem scientifically. It involves defining the strategy and rationale of a research problem. It also applies the methods and principles of studying the research gap and developing an approach consistent with the research objective.

Nature & Sources of Data

The researcher incorporates five years (2015-2019) of secondary data in this study that are balance panel in character. Secondary data are utilized due to being less expensive in terms of time & money at the time of its collection. Here required data are accumulated from the published reports of different MFIs in the micro-credit regulatory authority (MRA). MRA is

the regulatory authority of the microfinance industry of Bangladesh for that collected & utilized data are more reliable than any other sources regarding microfinance.

In this study, the target population is 746 enlisted microfinance institutions in the microcredit regulatory authority of Bangladesh. From the registered MFIs, purposively, 60 MFIs were selected as a sample in this study based on the availability of data on identified variables.

Variables

The study sort out the potential stimulus of financial self-reliance of sample MFIs in Bangladesh. To assess the stimulation of financial self-reliance, profitability is considered as explained variable and size, outreach, experience, management efficiency, staff productivity, debt-equity ratio as well as liquidity position (Kyereboah-Coleman & Osei, 2008; Ayayi & Sene, 2010; Dissanayake, 2012; Muriu, 2012; Rahman & Mazlan, 2014; Loan & Nguyễn, 2015; Adhikary & Papachristou 2017; Khan, Butt, & Khan, 2017; Abdishakur, 2020; Parvin, 2020) are explanatory variables. Out of that, the Inflation rate, real interest rate, and GDP growth rate are also considered country-level independent variables in this study. Here variables are incorporated from reviewing previous studies in developed and developing countries. Return on assets (ROA) is fundamental & parallel to the profitability of MFIs which reflects managerial efficiency in utilizing available assets for generating benefits for the MFIs (Gaul, 2011). ROA is the most suitable measure of MFIs in Bangladesh due to the invariably low equity of MFIs.

To examine the stimulus impelling the financial self-reliance of sample MFIs in this study researcher deployed pooled OLS, Random, and Fixed effect regression model. These models are applied to verify the coherence of the results. Subsequently, the Hausman test is operated to assess whether the fixed or random effect model is suitable for collecting data in this study.

Following are the models of analyzing data to fulfill the objective of this study. In model-1, only firm-level factors are included as explanatory of the dependent variable financial self-reliance of sample MFIs in Bangladesh. In contrast, in model-2, both firm level & country level factors are incorporated as independent variables of an explained variable.

$$Model\ 1.\ FSR\ (ROA) = a + \beta_1 (size) + \beta_2 (experience) + \beta_3 (efficiency) + \beta_4 (breathe\ of\ outreach) + \beta_5 (depth\ of\ outreach) + e$$

Alternative Hypothesis (H₁): All identified explanatory variables significantly impact the dependent variable (financial self-reliance) of the sample MFIs in Bangladesh.

Table 1. Dependent and independent variables

Variables	Name	Particulars
Dependent Variables	Financial self-reliance	Profitability (return on assets)
Firm-Level Independent Variables	Size	Log of total Assets
	Experience	Age
	Management efficiency	OSS
	Breathe of Outreach	Number of active borrowers
	Depth of Outreach	Gross loan portfolio

Source: From Literature Review

RESULTS AND DISCUSSION

Table 2. Descriptive Statistics

Variables	Observation	Mean	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis
ROA	300	0.0430773	.0229397	.0019	.1154	.5726	3.1138
Size	300	9.332967	.5853486	8.38	11.39	1.1780	4.7832
Age	300	1.492767	.1016553	1.11	1.68	-.2417	3.2700
OSS	300	1.181367	.1989079	.55	1.9	.3316	4.5488
NAB	300	327303.7	10349559	17328	6794853	5.0495	27.5103
GLP	300	824000000	2770000000	1300000	23000000000	5.4366	33.6848

Table 2 shows the descriptive statistics that are explained the nature and characteristics of data in a scientific research study. The mean value of return on asset (ROA) is 4.30 percent, indicating sample NGO MFIs' average return on assets is 4.30% for the study period. The above descriptive statistics table values of the mean and standard deviation of identified variables reflect the consistency among collected data. Discounts of both skewness and Kurtosis have also reflected normality in data. Collected data are normally distributed, which is essential before employing ordinary least squares for regression analysis.

Table 3. Correlation Matrix

Variables	ROA	Size	Age	OSS	NAB	GLP
ROA	1					
Size	0.4679**	1				
	0.0000					
Age	0.1965 **	0.3997**	1			

	0.0006	0.0000				
OSS	0.8474 **	0.4606 **	0.2146**	1		
	0.0000	0.0000	0.0002			
NAB	0.4392**	0.3976 **	0.2819**	0.4177 **	1	
	0.0000	0.0000	0.0000	0.0000		
GLP	0.4145 **	0.3990**	0.2778 **	0.4183 **	0.4692 **	1
	0.0000	0.0000	0.0000	0.0000	0.0000	

0.01***, 0.05**, 0.1*

The table 3 correlation matrix shows the positive correlation between the dependent variable (ROA) and independent variables (size, age, OSS, NAB, and GLP) that are statistically significant at a 5% level due to increasing explanatory variables and vice versa. Compared to other independent variables, the relationship ($r = 0.8474$) between operational self-sufficiency (OSS) and profitability (ROA) is highly positive. Through explanatory variables are positively correlated with each other, but these are less than $r = 0.5$, which means there is no multicollinearity among determined independent variables. From the set model, no independent variables need not be excluded due to the absence of multicollinearity.

Table 4. Ordinary Least Square model: Regression Analysis

Source	SS	df	MS	Number of Obs	=	300
Model	.116043753	5	.0233208751	F (5, 294)	=	165.22
Residual	.04129964	294	.000526232	Prob> F	=	0.0000
Total	.157343393	299	.000526232	R- Squared	=	0.7375
				Adj R- squared	=	0.7331
				Root MSE	=	.01185

roa	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]
size	.0030196	0.0017745	1.70	0.090	-.004727 .0065118
age	-.0044831	.0073626	-.61	0.543	-.0189731 .0100069
oss	.0919375	.003932	23.38	0.000	.084199 .099676
nab	.0000966	.000000271	3.57	0.000	.000000433 .00000150
glp	.000000322	.000000000101	-3.18	0.002	.000000000522 .000000000123
_cons	-.0875297	.016419	-5.33	0.000	-.1198434 -.055216

The study's main objective is to assess the stimulus of financial self-reliance of NGO MFIs in Bangladesh. For regression analysis, the ordinary least square model is applied by the researcher to fulfill the objective of this study. In this model, financial self-reliance, which Returns surrogates on Assets (ROA), is a dependent variable, and size, experience (age), managerial efficiency (OSS), breathe of outreach (NAB) as well as the depth of outreach (GLP) are explanatory variables. The developed model is statistically fit because the value of the F test is 165.22, which is significant at the 1% level. Beside this there is consistency between values of R-square ($R^2 = 0.7375$) and adjusted R-square ($Adj R^2 = 0.7331$). The value of R-square ($R^2 = 0.7375$) indicates that explanatory variables are liable to 73.75 percent (%) variation of the dependent variable. That is, the financial self-reliance of sample NGO MFIs is highly reliant on explanatory variables. The regression analysis also found that size, managerial efficiency, breadth of outreach, and depth of outreach are statistically significant determinants of financial self-reliance of NGO MFIs in Bangladesh at a 1% level. This finding of this study is consistent with Kyereboah-Coleman and Osei (2008), Ayayi and Sene (2010), Muriu (2012), Rahman and Mazlan (2014), Loan and Nguyễn (2015), Adhikary and Papachristou (2017), Khan, Butt, & Khan (2017), Abdishakur (2020) and Parvin (2020). It is also observed that all the explanatory variables positively impact the financial self-reliance of NGO MFIs in Bangladesh. Suppose NGO MFIs extended assets volume, enhanced managerial efficiency, increased the borrower's active number, and escalated gross loan portfolio. In that case, they become capable of generating adequate profit for financial self-reliance. Without ensuring financial self-reliance, NGO MFIs cannot meet their dual goals. For long-run survival, NGO MFIs must generate a significant profit through which they can cover up their relevant expenses and thereby serve the poor community in the eternal future.

The ordinary approaches for dealing with the panel data are the fixed effect model and the random effect model. To select the appropriate technique Hausman test is applied. Hausman test suggests a fixed effect model due to rejection of the null hypothesis as the p-value is less than 0.05 ($P < 0.05$). The fixed effect model indicates that some discarded variables that are not changed with time have an effect on independent variables.

Table 5. Fixed effect model

Fixed-effects (within) regression	Number of Obs	=	300
Group variables: dmus	Number of groups	=	60
R-sq: within = 0.4175	Obs per group : min	=	5
between = 0.4319	avg	=	5.0
overall = 0.4244	max	=	5
corr (u_i, xb) = -0.2488	F (59, 235)	=	33.68
	Prob> F	=	0.000

roa	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]
size	.0134104	0.0017745	1.76	0.080	-.0284552 .0016344

age	.1243436	.0489175	2.54	0.012	.0279707	.2207165
oss	.0742163	.0060841	12.20	0.000	.06223	.0862026
nab	.000000896	.000000881	1.02	0.310	.000000840	.00000263
glp	.000000000268	.000000000116	-2.30	0.022	.000000000497	.000000000385
_cons	-.1057847	.0394594	-2.68	0.008	-.1835242	-.0280453
Sigma_u .01604291						
Sigma_e .00907313						
Rho .75766112 (fraction of variance due to u_i)						
F test that all u_i = 0:			F (59, 235) = 4.52	Prob> F = 0.000		

The fixed effect model shows that size, experience (age), managerial efficiency (OSS), and depth of outreach (GLP) are statistically significant determinants of financial self-reliance of sample NGO MFIs in Bangladesh at a 1% level. Here all explanatory variables positively impact the financial self-reliance of NGO MFIs which is like the ordinary least square model.

The comparison of OLS and fixed effects models outlines that all the signs of all explanatory are the same for both fixed effects and OLS. Out of this, in OLS, experience (age) is not a statistically significant determinant, whereas, in fixed effect, it becomes a significant stimulus as well as in the fixed effect model, breathe of outreach (NAB) is not significant, but in OLS it becomes significant.

From the above analysis of both OLS and fixed effect models, it is found that all the identified explanatory variables are the statistically significant stimulus of financial self-reliance of studied NGO MFIs in Bangladesh.

CONCLUSION

Microfinance is a proven empirical tool to fight against poverty in third-world countries like Bangladesh. Initially, microfinance facilitates financial services to the rural unbanked community for their self-dependency. After 1990 besides the formal & semi-formal financial sectors, microfinance institutions play a crucial role in the economic development of Bangladesh. Microfinance institutions also contribute to financial inclusion. NGO MFIs could serve poor people in the long run only when they generate adequate profit.

For this reason, the main purpose of this study is to determine the stimulus of the financial self-reliance of NGO MFIs in Bangladesh. As a sample, sixty (60) MRA registered NGO MFIs are chosen along with the latest five years of panel data from 2015 to 2019. Return of Assets (ROA) is a proxy of financial self-reliance, which is the dependent variable in this study where size, experience (age), managerial efficiency (OSS), breathe of outreach (nab) & depth of outreach (GLP) are explanatory variables. For analyzing the data, stata-12 is used by which ordinary least square model & fixed effect model are operated for determining the stimulus of financial self-reliance of sample NGO MFIs. Results of both models suggested that size, experience (age), managerial efficiency, the reach of outreach, and depth of outreach are the statistically significant stimulus of financial self-reliance of NGO MFIs in Bangladesh at a 1% significant level. OLS also found that independent variables are explained by a 73.75% variation of dependent variables, i.e., financial self-reliance (ROA). In this study, the researcher recommended that Bangladeshi NGO MFIs increase their profitability for long-run survival by making good quality assets, achieving experience, improving managerial efficiency, selecting the right number of active borrowers, and enlarging the magnitude of loans. The current study may be extended by incorporating more firm-level and country-level variables.

Author Contributions: Conceptualization, A.A.; Data Curation, A.A.; Methodology, A.A.; Validation, A.A.; Visualization, A.A.; Formal Analysis, A.A.; Investigation, A.A.; Resources, A.A.; Writing – Original Draft, A.A.; Writing – Review & Editing, A.A.; Supervision, A.A.; Software, A.A.; Project Administration, A.A.; Funding Acquisition, A.A. Authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement: Ethical review and approval were obtained for this study.

Funding: The authors received no direct funding for this research.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

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