| Research Article |

Understanding the Impacts of Diversification on Financial Performance and Sustainability: A Case of South Asian Microfinance Institutions

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***Abstract**: The concept of microfinance has gained much importance as it can effectively eradicate poverty of deprived segments and achieve economic development especially in developing economies. Microfinance institutions (MFIs) are observed to have a hybrid objective of both social and financial nature. Existing literature has ignored some essential dimensions of diversification that can influence the financial performance of microfinance institutions. This study collected data from the World Bank for 152 South Asian microfinance institutions for the time period 2012-2019. This research has employed GMM approach with xtabond2 command and findings of the study reveal the significant impacts of various dimensions of diversification for sustainability of microfinance institutions. This study suggests that commercialization of MFIs and adoption of technological advancements has emerged as a result of enormous drop in subsides and donations that doubted goal of sustainability and profitability. Thus, all MFIs generate income through both financial and non-financial services. This has also led to their expansion of social outreach as well as decrease in their operational cost and hence, high financial performance and ultimately sustainability. These findings recommend that microfinance institutions have to pay attention to formulate various policies and offer more diversified services to attain their hybrid objective.*

Keywords: *Diversification, Sustainability, Microfinance Institutions (MFIs), South Asia*

List of Abbreviations:

MFIs- Microfinance Institutions
OSS: Operation self-sustainability
ROA- Return on assets
ROE- Return on equity
PAR30- Portfolio at risk for 30 days

I. Introduction

The earliest evidences of microfinance are found in Europe during 18th century. While the strands of modern microfinance institutions (MFIs) come from Grameen Bank of Dr. Muhammad Yunus, an economist and banker of Bangladesh, so South Asia can be considered as hub of MFIs There are almost 10,000 MFIs operating around the globe (Marconatto et

al., 2016). According to BNP Paribus (2019), targeting the poor has led to an increase in clients of MFIs to 139.9 million, with subsequent increase in gross loan portfolios to $124.1 billion that ultimately translates into an overall growth of 8.5%.

Unlike traditional financial institutions, MFIs have dual objective of both outreach and sustainability (Elsas, Hackethal & Holzhauser, 2010). To achieve this twin objective, also known as double bottom line, MFIs make their strategies and operate accordingly. There is always a tradeoff to achieve this dual objective. The first goal of outreach can only be attained by use of external donations and government subsidies as they have to serve large number of poor people. While the same loan disbursement strategies also followed by traditional financial system are adopted by MFIs in order to achieve the other goal of financially sustainability (Githaiga, 2021).

This situation has arisen some critical question like can microfinance industry serve the poor segment while attaining sustainability at a time? What are the various effective diversification strategies to improve profitability and how these diversified strategies have impacts on sustainability? (Chikalipah, 2017). Hence, ultimate survival and competitiveness can only be achieved on the behalf of financial sustainability. A single source of revenue can never boost a firm sustainability. So innovative and diversified methods other than lending can encourage profitability as well as sustainability (L. Remer & H. Kattilakoski, 2021; Churchill, 2020).

The concept of diversification is grounded on Markowitz's (1952) Modern Portfolio Theory. This theory's central proposition is that investors can maximize the expected return rate and minimize risk by choosing the right combinations of various assets in the portfolio. By diversifying income streams, firms avoid unexpected downturns of the primary revenue. Diversified strategies improve the performance of different kinds of firms: savings cooperative societies, credit unions, commercial banks and nonprofit making entities (Cull et al, 2007). In the banking sector, evidence of cross selling and cross-subsidization is determined (Stiroh, 2004). This implies that engaging in nonlending activities may also stimulate MFIs' lending business and ultimately improve performance and financial sustainability.

Though diversification is a probable adaptive response to MFIs' financial sustainability. There is support for the offering various financial and non-financial services to the ignored and unbanked segment but still debate exist among academicians, microfinance policy makers and practitioners to understand the impact of microfinance and their sustainability problem (Rahman, 2014). Various studies are conducted across the globe to determine the appropriate answer. Some evidenced positive impacts of diversifiation strategies (Morduch, 1999; Dunford, 2006) and other reported simply no impact or sometimes negative impacts (Montgomery, 2005).

Current paper has identified some gaps and contributes in literature on many ways as first of all, the role of diversification on financial performance is examined mainly in traditional banking perspective. In case of MFIs, only a few studies have focused only on

revenue or geographical diversification and rest are still unclear about comprehensive review of other diversification strategies and their benefits for financial performance of MFIs (Githaiga, 2021; N. Ammar & A. Boughrara, 2019). Therefore, this study is going to determine overall diversification perspective from revenue, asset, product and geographical, etc. at once in microfinance sector and then point out their impacts for sustainability of South Asian MFIs. That's is another uniqueness of this study thus exclusively focus on examining South Asian region. In addition, dataset of current study is the recent available quantitative data till 2019. Lastly, advanced technique of GMM is employed to test the hypothesis for panel data.

In a precise way, current quantitative study has examined the effects of various diversification measures on operational self-sufficiency, return on assets and return on equity using balanced panel data model under GMM approach for 152 South Asian MFIs collected from MIX market for time period 2012-2019. The Stata package, xtabond2 is used. The empirical results show that revenue and asset diversification affect significantly performance of MFIs but product diversification does not. While geographical diversification affect profitability measures only.

So, these results infer specially microfinance institutions of south Asia should diversify their income sources.

Rest of the study is organized as the next section has explained microfinance industry in South Asia. Then, review of empirical and theoretical literature is provided and hypothesis are developed. Further section has described data, variables and methodology in detail, followed data analysis section, Lastly, final section has discussed the finding and conclusion of the study.

2. Overview of Microfinance Industry in South Asia

Asia being the largest continent of the world, consist of 48 countries. It covers one third of total land area of our world. This most complicated land is divided into many regions named as South Asia, East Asia, Central Asia, Middle East, Asia Pacific and Russia as well. It demonstrates South Asia as a prominent continent of this planet Earth. As far the growth of South Asian region is concerned, it showed tremendous rise of 21% in GDP with respect to purchasing power parity from year 2000 to 2018 (Asian Development Bank, 2019).

To cope with poverty, South Asian countries have also followed various strategies and one of those is Microfinance (Fernando, 2000). The early roots of appearance of microfinance are also found from Bangladesh during early 1970s. Behind the emergence of need of microfinance from the poor and unbanked segment of people of south Asia, was unequal distribution of wealth. So, this sector flourished rapidly and was accepted positively (Kuroda, 2013).

Generally, microcredit and micro-savings are prime services offered in microfinance institutions. along with these, South Asian MFIs also started to provide diversified services

like trainings for the efficient utilization of loans to the poor clients, fund transfer, leasing, micro-insurance, energy loans, remittance etc. (Bedson, 2009). Microfinance institutions in some Asian countries like Bangladesh, India, Pakistan offered diversified products of micro insurance and leasing but on opposite, in some countries like Sri Lanka there is focus only on microcredit products without any offer related to diversified products. Further, about 130 million poor population have no access to any traditional or non-traditional financial services or even micro finance services. Similarly in Nepal, about half populations is living without any access to financial services (Asian Development Bank, 2019).

Besides this, in South Asia, microfinance institutions are in their most developed form. Various government banks and other non-government institutions, credit unions and cooperative societies are providing microfinance services (Microfinance Institutions Network, 2017). Government owned MFIS mainly banks and Non- Bank MFIs, only focused on microcredit products without any emphasis on outreach, with their prime mission of financial sustainability. On the opposite, the objective of NGOs is access to a large number of poor people. NGOs play significant contribution in microfinance sector as some countries of Asia have large proportion of NGOs than others like Bangladesh, India, Nepal, Sri Lanka (Fernando, 2000).

South Asian microfinance sector is using two types of methodology to grant loans one is individual lending and other is group lending (Fernando, 2000). The more popular of these two is group lending inspired from Grameen Bank model. Bangladesh was actually the first country who introduce group lending strategy where groups consist of eight to ten persons were selected for tiny loans. On the other side, individual lending grant relatively large amount of loans for credit worthy and well reputable poor clients. In this regard, Pakistan is the founder of individual lending to provide credit services for the clients residing in urban areas.

Furthermore, MFIs in some South Asian countries like, Afghanistan, Bhutan lack satisfactory regulatory framework. Regulatory and legal framework is considered necessary in terms of volume of MFIs transactions which accounts for 95% of the total MFIs' transactions. In terms of performance and development of MFIs, Asian region has the largest and highest volume of savings and loans. There is higher number of staff working in microfinance institutions in South Asia as compare to other regions of Asia (Lapenu & Zeller, 2001).

Despite having a prominent role in the microfinance field, South Asia is facing some issues which are crucial when performance of MFIs in this region is to be studied. These issues include; high level of poverty, unequal distribution of wealth, political instability, lack of regulatory framework, sustainability. Serious efforts have been made to remove vicious circle of poverty from this region. All the challenges faced by MFIs require studying the performance of microfinance sector in the context of the diversification.

3. Literature Review

Diversification is considered as the most fundamental concept in portfolio theory (Markowitz, 1952). The concept of diversification was further elaborated by Ansoff (1957). There are various motives behind adopting the strategy of diversification by a financial institution. Of these the most popular reasons are efficiency achieved by economies of scope and idiosyncratic risk minimization (Chiorazzo, 2008). Along with, the diversification efforts in various geographical lines are also facilitated due to enhanced managerial efficiency perspective (Zamore, 2019).

Due to technological advancements and policy variations, diversification can be classified into some broad categories namely; income diversification, geographical diversification and assets and product diversification (DeYoung, 2004). Income diversification is related to offering wide range of financial product or services by various financial institutions while geographical diversification is referred as expansion in number of branches in new areas or regions even different countries so that they can offer financial services in vast markets in order to provide operations in regions and countries. In addition, offering different types of loans in a single loan portfolio is referred as asset diversification (Meslier, 2014). While product development strategy is where financial institutions diversify in such a way that either they modify and improve their current products offered or they introduce or add new innovative products in current product line.

While studying empirical literature, research findings were mixed and two views were found for the relationship of diversification on the financial performance in the context of microfinance institutions. According to proponents of diversification, it is very helpful for banking microfinance institutions to diversify across their wide range of business products. For instance, financial performance of banking MFIs was positive correlated with geographical diversification and is also beneficial to allocate internal capital efficiently as evidenced by Zamore, 2019 and Deng & Elyasiani, 2008. Diversification can create value for the firm and it increase the financial performance with respect to both return on assets and return on equity and even during unstable markets and crisis these findings are robust (Milani & Salvini, 2008; Sanya & Wolfe, 2010; Sissy, Amidu & Abor, 2017)

In the context of microfinance institutions, a recent study of Githaiga, (2021) investigated the positive effects of revenue diversification on financial sustainability of MFIs. This panel data study from time period 2013-2018 for 108 countries measured revenue diversification with the help of Herfindahl index and financial sustainability with FSS. Churchill (2020), in another study determined an increase in financial sustainability of MFIs with the increase in outreach. This study comprised of 1595 MFIs from 109 countries. The findings of this study suggested a trade-off between outreach and financial sustainability.

The changes in the performance of microfinance institutions due to the involvement of competition were examined by Wondirad (2020). 184 MFIs of India were studied for time period 2005-2014. The findings revealed that the relationship of social and financial performance was positively moderated with competition. The role of diversification was also

checked by Zamore (2018) with the help of Herfindahl Index (HHI) and ROA, ROE, OSS and some control variables. The findings evidenced that revenue diversification improves financial performance as well as sustainability of MFIs.

As far as the measurement of financial sustainability is concerned, the most widely use proxy is operational self- sufficiency (OSS). This is considered as the most reliable and popular measure in microfinance literature that are collecting data from MIX market (Zamore, 2019). Another measure of financial performance is profitability. Literature has evidenced various measures to determine profitability level; return on assets (ROA), return on equity (ROE), earning per share (EPS), operating profit etc. Of all these indicators, the most popular and commonly use proxies for profitability are ROA and ROE (Kinde, 2012).

Keeping in view the operational inefficiency, managerial incapability and monitoring problems, current study also suspects about negative impacts of diversification in MFIs. Above empirical literature predicts conflicting mixed results between the relationship of diversification both revenue and geographic with financial performance and financial sustainability. As a whole, the findings inferred from traditional financial institution are not presenting a definite picture for microfinance institutions therefore, current study endeavors to understand whether sustainability and overall financial performance have positive relationship with the diversification or not in South Asian MFIs.

3.1 Conceptual Framework

Under the conceptual framework in figure 1, current study has developed following hypothesis to test the proposed relationship among the variables of the study.

Hypothesis 1: Revenue Diversification has significant relationship with sustainability of microfinance institutions

Hypothesis 2: Asset Diversification has significant relationship with sustainability of microfinance institutions

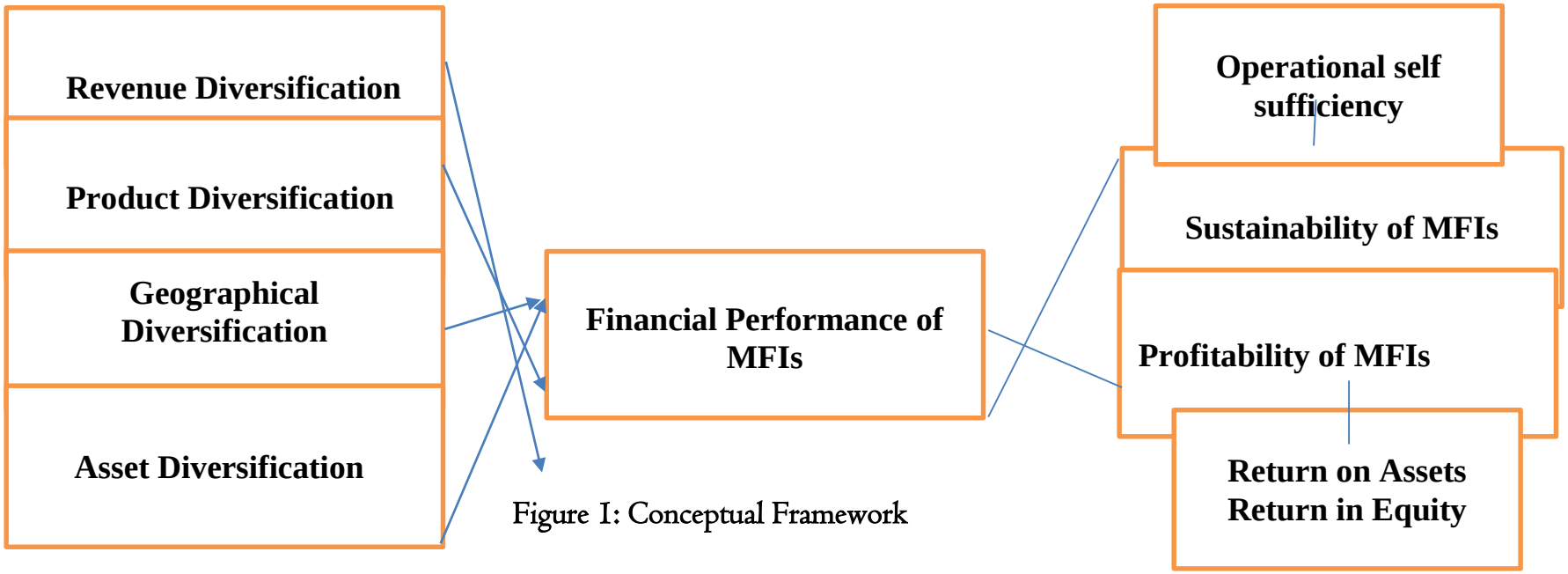

Figure 1: Conceptual Framework

Hypothesis 3: Product Diversification has significant relationship with sustainability of microfinance institutions

Hypothesis 4: Geographical Diversification has significant relationship with sustainability of microfinance institutions

4. Methods and Research Design

4.I Research Approach and Data Collection

Current study is quantitative and descriptive study in nature to explain the relationship among variables. All the secondary data is collected from Microfinance Institutions Exchange (MIX market), maintained and supported by World Bank.

The population of current study comprise of data set of MFIs from South Asia. Total 500 MFIs from South Asia are registered on MIX market. The sample of current study consists of total 152 microfinance institutions from 07 South Asia countries (1216 observations) for the time period 2012-2019. Sample selection is based upon following criteria. i) registered MFIs on MIX market. ii) MFIs having data available from 2012 to 2019 iii) those MFIs are selected with at least five years data

Table 1: Country wise Sample segregation of MFI

Region	Countries	MFIs Registered	Sample
South Asia	Afghanistan	06	04
	Bangladesh	83	31
	Bhutan	07	01
	India	266	79
	Pakistan	84	26
	Nepal	28	09
	Sri Lanka	16	02
	Total	500	152

4..2 Variables Measurement

In the empirical model of current study, diversification is independent variable while sustainability and profitability are dependent variables as measures of financial performance. Some control variables are also included in current study.

4.2.1 Dimensions of Diversification

There are some broad categories for measurement of diversification in financial institutions like revenue, product, asset, geographical etc.

Revenue Diversification (RDIV): comprised of Herfindahl Index as explained in formula given below. Increase in the value of this measure would suggest more diversified an MFI is while a value close to zero would imply that almost all income is generated from single source of interest income only (Stiroh & Rumble, 2006; Meslier et al. 2014; Jouida, 2017).

$$HHI = [(Interest\ Income/Netop) + (Non - Interest\ Income/Netop)]$$

$$RDIV = 1 - HHI$$

where HHI is Herfindahl Index HHI Net op is net operating revenue and RDIV is level of revenue diversification. A higher value of RDIV reveals more income sources.

Geographical Diversification (GDIV): The most common measures of geographic diversification in previous studies include number of branches and number of regions or states (Zamore, 2019; Deng and Elyasiani 2008). In this study, geographic diversification is measured as the number of branches a MFI has.

Product Diversification (PDIV): MFIs can generally be categorized into two group to determine product diversification by use of dummy variable. MFIs that provide only loans, value of 1 otherwise 0 (Chen at al. 2013).

Asset Diversification (ADIV): This is very effective measure to determine diversification level from the lending to non-lending activities (Laeven & Levine, 2007). The asset diversification will be measured as under where, other earning assets may be underwriting, insurance etc.

$$ADIV = 1 - [\frac{Net\ loans - other\ earning\ assets}{Total\ earning\ assets}]$$

4.2.2 Financial Performance

As per Figure 1, dependent variable of current research is financial performance that is measured with the help of sustainability and profitability.

First measure is Operational Self-sufficiency (OSS) that will measure how MFI is sustainable in the long run with covering all their operating cost and maintaining their share value. OSS is calculated with the help of given formula (Kinde, 2012; Mersland & Strom, 2014). The value of OSS greater than 100 indicates self-sustainability of MFIs. It reveals that MFI is generating sufficient revenue to meet its operational cost. Higher the value of OSS, better it is for a MFIs to be more sustainable.

$$OSS = \frac{Total\ Operating\ Revenue}{Financial\ expenses + Operational\ Costs + Loss\ on\ Loan\ Expenes}$$

The driver behind sustainability is profitability of MFIs. Both these determine overall financial performance that is measured by various proxies. There are five different methods to evaluate the financial performance of MFI as breath of financial access, depth of financial access, frequency of loan repayment, sustainability and profitability (Hermes, Lensink & Meesters, 2011). Current study determines profitability with the help of Return on Assets (ROA) and Return on Equity (ROE).

Current study also employs some control variables also used in previous studies (Githaiga, 2021; Zamore, 2018). Age of MFIs is total number of years when MFI establish. Older MFIs perform better as compare to newly established MFIs (Pascal, Mersland & Mori, 2017). Firm size also affects sustainability as large firms get the advantage of economies of scale. Size of MFIs is measured as log of total assets (Mersland & Strom, 2014). There is tradeoff between outreach and sustainability of MFIs (Churchill, 2020). Outreach measures total number of active borrowers

Political stability is also included as control variable in current study. Political stability index by World Bank, World Governance Indicators (WGI) will explain the level of political instability. MFIs are found more established in political unstable economies (Kaufmann, Kraay, & Mastruzzi, 2011). In addition, following Sanya & Wolfe (2010) approach some country level control variables are also included as

GDP growth that is the annual growth rate of GDP and inflation, consumer price index.

Table 2: Variable Description and Sources

Variables	Measured by	Source	Used by Authors
Independent variable			
Revenue Diversification	Herfindahl Index	MIX	Githaiga,2021; Stiroh,
Product Diversification	Only Loans or other than loan	Market	2004
Asset Diversification	service	MIX	Chen at al. 2013
Geographical	lending to non-lending	Market	Levine, 2007
Diversification	activities	MIX	Zamore,2017
Dependent variables	Total number of branches	Market	
Operational Self-		MIX	Chikalipah, 2017
sufficiency	Operational sustainability	Market	Churchill, 2020;
Return on assets	Ratio of net income to total		Chiorazzo,2008
Return on equity	assets	MIX	Chikalipah, 2017, Chen at
Control Variables	Ratio of net income to total	Market	al. 2013
size	equity	MIX	
		Market	
	Log of total assets	MIX	
		Market	
		MIX	
		Market	
Outreach	Number of Active Borrowers	MIX	Githaiga,2021; Chikalipah,
Political Stability	Political stability Index	Market	2017
GDP growth	Annual growth rate of GDP	World Bank	Kaufmann & Mastruzzi,
Inflation	Consumer price index	World Bank	2011
		World Bank	Zamore, 2019
			Sanya & Wolfe; 2010

4.3 Regression Models

The basic regression model will estimate the relationship among variables. Diversification (DIV) as independent variable and measures of sustainability (OSS) and profitability (ROA, ROE) as dependent variables with the presence of control variable (size,, outreach, political stability along with GDP growth and Inflation) are employed to test the hypothesis.

Researcher has developed following separate equation models based on two variables

Model 1 sustainability model $OSS_{it} = \beta_{\circ} + \sum_{i=1}^{i} \beta_i DIV_{it} + \sum_{j=1}^{j} \beta_j CV_{it} + \mu_{it}$

Model 2 Profitability Model $ROA_{it} = \beta_{\circ} + \sum_{i=1}^{i} \beta_i DIV_{it} + \sum_{j=1}^{j} \beta_j CV_{it} + \mu_{it}$

$ROE_{it} = \beta_{\circ} + \sum_{i=1}^{i} \beta_i DIV_{it} + \sum_{j=1}^{j} \beta_j CV_{it} + \mu_{it}$

In the above equations: DIV- Diversification measures ROA-Return on assets
OSS- operational Self-sufficiency ROE- Return on Equity CV- Control variables

5. Results and Discussions

This research has analyzed the data by using latest version of Stata. Results are given below.

5.1 Descriptive Statistics

To estimate the appropriation of the model, this study has applied various descriptive statistics to check the behavior of the data. Descriptive statistics are the numeric measures that provide information with respect to minimum and maximum values of data, variance, centra tendency (Jackson, 2009).

As per results of descriptive statistics in table 3, firstly dependent variables are described. Mean score of OSS is 117.538 that describes that operational sustainability of MFIs in South Asia is satisfactory and they are generating sufficient revenue to fulfil their operational cost because higher the value, better it is to be more sustainable. Mean value of ROE is 4.767 that describes that South Asian MFIs are earning adequate revenue out of their equity. It reveals satisfactory financial performance

Table 3: Descriptive Summary

Variables	Mean	Standard Deviation	Minimum	Maximum
OSS	117.538	27.759	1.44	285.01
ROE	4.767	2.545	-2.17	36.91
ROA	2.563	2.171	-.52	6.47
RDIV	0.137	0.097	0.055	0.56
ADIV	.116	.338	-.07	9.9
PDIV	.728	.445	0	1
GDIV	183.955	420.898	1	3045
Size	7.325	.831	4.72	9.91
Outreach	399224.62	1078577.6	10	8934874
Political Stability	-1.313	.644	-2.8	1.12
Inflation	148.65	17.959	114.77	188.73
GDP Growth	6.082	1.692	-.22	12.75

Note: total observations N=1216

Minimum value for ROE of -2.17 shows some low profitable institutions while maximum value is 36.91. Average value of ROA is 2.563 that is slightly below than international MIX market benchmark of 3% (ACCION, 2004). Overall, it describes that most of the MFIs are generating sufficient income out of their assets. Current study has examined the diversification impacts with the help of various dimension. Average score of first measure, revenue diversification is 0.137 that is lower

than RDIV value of 0.3 observed in banking sector. It describes that on average this 13% revenue is generated from non- interest revenue sources of MFIs in South Asia.

5.2 Multiple Regression Analysis

Traditional ordinary least square (OLS) model shows inconsistent results due to omitted variable biasness for macro institutional factors, reverse causality and endogeneity. Further, this traditional technique of OLS like pooled OLS, fixed effect, random effect may cause errors due to omission of endogenous variables (Wang, 2021). To address all these deficiencies of OLS technique, Arellano and Bond (1991) introduced Generalized Method of Moment (GMM) approach They proposed that difference GMM is a method to resolve the endogeneity problem and it also controls individual effects. Later on, Blundell and Bond (1998) suggested that system GMM as more efficient technique than difference GMM with the help of using Monte Carlo simulations. According to Blundell and Bond (1998), for small sample with weak instruments, biased results are obtained with difference GMM.

The preference of system GMM over difference approach is also based upon its moment condition requirement and endogenous lagged dependent variable (Wang, 2021). Moreover, GMM approach has also capability to overcome inherent issues of panel data like heterogeneity and endogeneity problems. Furthermore, Roodman (2009) extended the system GMM approach with the help of command, xtabond2 in Stata. But before applying this command of xtbond2, certain conditions need to be fulfilled. They are firstly short panel (where Large N and small T), correlation of explanatory variables with error, dynamic dependent variable, individual fixed effect, heteroscedasticity and autocorrelation and linear functional relation. Another unique feature is that Xtbond2 also estimate outcomes of Sargan test and Hansen test. Existence of first and second order autocorrelation are checked also with the help of Arellano-Bond test of AR(1) and AR(2). Xtbond2 can also collapse instruments to limit instrument proliferation (Roodman, 2009).

Therefore, current study has also applied technique of system GMM with xtbond2 command as in line with existing literature. With xtbond2 command, post estimation test of system GMM are also justified.

Table 4: Multiple Regression Analysis-System GMM with xtbond2

	Model I		Model II
Dependent Variable	OSS	ROA	ROE
Variable	Coefficient	Coefficient	Coefficient
Lag_ OSS			
Lag_ ROA	.443***		
Lag_ ROE		.413***	
			.599***
RDIV	.337***		.314***

		.116***	
ADIV	-2.894**	.13*	-3.195*
PDIV	-2.429	-.179	.452
GDIV	-1.064	.183*	2.154***
Size	3.625**	.12	-1.269
Outreach	0	0	0
Political Stability	-1.415	-.312**	-.093
Inflation	.083	.006	.019
GDP Growth	.574**	.121*	-.175*
Constant			
Wald Chi square	15.717	17.45	19.545
Hansen Test			
Arellano-Bond Test for AR(1)	207.52***	405.89***	207.52***
Arellano-Bond Test for AR(2)	7.49	3.53	7.08
	5.80***	-7.48***	-6.93***
	0.58	-1.25	.58

Source: researcher own calculations based on data collected from MIX market

Note: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level

Table 4 reveals significant and positive impacts of revenue diversification on OSS, ROA and ROE. The beta coefficient value reveals that one unit change in revenue diversification will change 0.33, .116 and .314 units change in OSS, ROA and ROE Thus, we accept H1. These findings are consistent with results reported by Zamore, 2017, Githagia, 2021 in case of MFIs. The reasons behind positive impacts of RDIV on financial performance reveals that MFIs can utilize their excess financial as well as human resources by engagements in non-lending services and gain competitive advantage. Secondly, this helps in attaining economies of scope between interest and non-interest income activities that makes MFIs more sustainable. Moreover, findings present that involvement in non-lending activities improve the profitability of MFIs as assets are efficiently utilized. In addition, the probable reason behind positive impacts of RDIV on profitability might be the adoption of cross selling techniques as MFIs are utilizing existing information of their clients by offering various non-financial services. The graphical behavior with respect to each country of South Asia of OSS, ROE and ROA of are depicted in Figure 2. They show that almost all south Asian countries are sustainable as OSS value is in range of 100 and above. Along with ROA and ROE of Afghanistan is negative while rest countries are exhibiting appropriate positive trends.

Figure 2: Graphical Behavior of dependent variables

The impact of asset diversification (ADIV) is also found to be significant at 5% level and the beta coefficient value is -2.894, .13, -3.195. which reveals that one unit rise in ADIV is likely to cause a negative change of almost 3 times in OSS, ROA respectively. Thus, we also accept H2. While product and geographical diversification are also showing insignificant results with coefficient value of -2.429 and -1.064 respectively in case of OSS, -.179 and 0.183 with ROA and coefficient value of -.452. Therefore, H3 is not accepted but GDIV shows significant impact at 1% and 2.1 times increase in ROE. Thus, we partially accept H4.

Among the control variables of this study, only size is observed to be highly significant positive relation with OSS of MFIs at 1% level of significance. Rest control variables are found with an insignificant relationship with OSS. Due to heteroscedastic robust estimates, Wald Chi square test has checked the goodness of fit and significance of the regression model of current study. This shows that both models are good fit with 1% level of significance. Results also shows that Hansen test is not significant that reveals no evidence of over identifying restrictions and adequate instruments in model specifications. Further, the presence of AR(1) and non-existence of AR(2) is confirmed with the help of Arellano-Bond test. Moreover, lagged value of OSS as dependent variables is also significant which also validates the endogeneity issues in this model of panel data study.

6. Conclusion of the study

In microfinance industry, always a tradeoff between outreach and sustainability is recognized. A successful MFI has to manage a balance between expenses and income sources in order to be sustainable. With time, sustainability of MFIs has gained much importance along with profitability due to which new players are entering in microfinance market. Hence, ultimate survival and competitiveness can only be achieved on the behalf of financial sustainability. A single source of revenue can never boost a firm sustainability. So innovative and diversified methods other than lending can encourage profitability as well as sustainability (Churchill, 2020).

It is inferred that achievement of long term and short-term goals leads towards diversification. Moreover, rise in the competition due to the entry of commercial banks is another motive. In addition, MFIs are diversifying to manage the effects of interest rate fluctuations also (Bandelj, 2016; Hayden et al., 2007). Enormous drop in subsides and donations is noticed in recent past and the internal funds of MFIs are not adequate to attain appropriate levels of sustainability and profitability. Consequently, the commercialization of MFIs came into introduction. Many technological advancements like use of mobile based financial services are also adapted by these MFIs (Wondirad, 2020).. Thus, these technological advancements have enabled MFIs to offer a wide range of financial services to the unbanked sector. This has led to their expansion of social outreach as well as decrease in their operational cost and hence, high financial performance. To gain and retain customer base is one other important reason behind diversification (Jha, S.K.*et al*, 2021)

Some research directions are also suggested here after current research. Firstly, in about the role of diversification in MFIs, only a few studies are noticed and the picture is still unclear about exact

diversification strategies and their benefits for MFIs. Thus, future researcher can construct a composite diversification measure to understand broad impacts. Secondly, most of the studies have used different measures of financial performance to check sustainability and profitability. Such as, some checked it with the help OSS, ROA, ROE, or FSS. In addition, measures of OSS and FSS also vary from study to study (Githaiga, 2021; Chikalipah, 2017). Therefore, current study suggests future researchers to fill the gap by constructing a composite measure for sustainability of MFIs. This would infer further that whether microfinance institutions should diversify their income sources or not. In addition, the role of diversification could also be estimated on profitability of MFIs separately.

Another perspective observed from previous literature is that none of the study has examined this relationship of sustainability with the Islamic Microfinance especially with respect to diversification. So, new researcher can conduct research having sample from both conventional and Islamic MFIs. Lastly, current study has noticed that statistics from other MFIs like non-bank financial intermediary, cooperative bank, non-profit organization can also be analyzed if availability of data to understand the impact of diversification for both profited oriented MFIs and non- profit MFIs.

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Figure I Legend: Conceptual framework has explained the proposed relationship among the independent and dependent variables of the study.

Figure 2 Legend: Graphical Behavior of dependent variables has explanied trends of MFIs of various south asia countries.

Declarations

1. **Competing Interest**

The authors declare that there is no competing interest among themselves

2. **Availability of data material**

This research has used secondary data that is retrieved from World Bank database, MIX market. https://databank.worldbank.org/. It is also declared that all the supporting data and materials are available to authors and it will be provided to journal if needed.

3. **Ethics approval and consent to participate**

This article does not contain any study with human participants performed by any of the authors.

4. **Consent for Publication**

All the authors have given their consent to publish this research article in this journal. It is also declared that this manuscript is original and has not submitted in any other journal for publication.

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6. **Authors contribution**

NA: Conceptualization, Methodology, data collection, data analysis, writing the original draft. SM: supervision, review

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