Microfinance Institutions and Poverty Reduction:
A Cross Regional Analysis

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1. INTRODUCTION

The alleviation of poverty is one of the most debated issues among the academicians and policy makers. From 1950s to 1980s the poverty reduction program has been based on increase the participation of poor into the economy by better macroeconomic performance. Though the poor part of population mostly engaged in informal sector[1] is identified by researchers but has not become the part of economic models and government policy [Robinson (2001)]. Poverty reduction has been institutionalised in 1944 when World Bank was set up. The World Bank worked through governments and institutions by giving loans to developing countries called structural-adjustment programmes. These programmes were highly unsuccessful, created dependence on aid with little help to poor part of societies [Murduch (1999) and Diop, *et al*. (2007)].

This failure due to distrust in formal institutions give the beginning of a shift in development thinking that leads to the emergence of microfinance. The focus is support of the informal sector by providing credit to help people to pull them above the poverty line. Microfinance helps these informal micro-enterprises through micro-credit. The micro-credit approach to poverty reduction is "the provision of small loans to individuals, usually within groups, as capital investment to enable income generation through self-employment" [Weber (2006)]. The informal businesses of poor are referred as a type of un-met demand for credit. Poverty is considered as the outcome of market failure,[2] microfinance would correct the market failure, providing access to credit to the poor. Credit would create economic power that would generate into social power, lifting the poor out of poverty [Yunus (1999)].

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Authors' Note: The errors and omissions are authors' sole responsibility.

[1]Until 1980s the presence of in-formal microenterprises- street vendors, home workshops, market stalls, providers of informal transportation services-are generally considered by policy-makers and economists to be a result of economic dysfunction [Robinson (2001)].

[2]Market imperfections, asymmetric information and the high fixed costs of small-scale lending, decrease to reach of the poor to formal finance, thus the poor will chose the informal financial sector or to the worst case of financially excluded [Green, Kirkpatrick, and Murinde (2006)].

Thereafter, microfinance is considered as an important tool for reducing poverty.[3] These developments have generated high expectations from the microfinance programs to alleviate poverty effects among donors and policy makers and aid organisations. However, latter it is recognised that microfinance programmes can play long term and significant role to reduce poverty, MFIs need to be successful in extending loans to poor borrowers, while at the same time being able to at least cover the costs of their lending activities, i.e., they may need to focus on being financial sustainable in the long run" [Armendariz and Labie (2011)].

MFIs are facing a double challenge in reducing poverty: they have to provide both financial services to the poor (outreach) and also cover their costs in order to avoid bankruptcy (sustainability). This is the main motivation to assess MFIs' both dimensions to deal poverty that are taken into account in the present paper.

The present study tries to answer this question by analysing whether microfinance institutions have played some role in reducing poverty in six regions and around the world. The main focus of this study is to find out the determinants of outreach in microfinance industry. The study explores the dimension of outreach depth or breath of outreach, cost of outreach and expected future outreach that are more meaningful in alleviating poverty. The impact of institutions specific factors like cost, profitability, and MFI age, MFI size, lending methodology, regulation and risk on the outreach of MFIs are investigated. The country specific factors such as economic conditions of the country and regional dummies are also included to examine their impact on outreach in six regions of the world.

The study contributes to the existing literature by investigating depth, breath and cost of outreach of MFIs in reducing poverty, increasing empowerment opportunities and maintains sustainability in microfinance institutions. It also highlights that the tradeoff is required by MFIs in outreach and sustainability in order to perform microfinance activities for a longer period of time. Since the cost of outreach is higher that demands an optimal level of profitability that can be generated through efficient management of MFIs through cost reducing on regular basis. This study also signifies that age, size, regulation, lending methodology, legal status and geographic location of MFIs, human development index and population density to capture country specific factors also affect their outreach.

After brief introduction the remainder of the study is organised as follows. Section two reviews the relevant literature on the role of microfinance on poverty alleviation. Methodology and data used in the analysis is discussed in section three. The empirical results and their interpretation are provided in section four and last section offers conclusion.

2. LITERATURE REVIEW

A large number of studies on the impact of microfinance in poverty reduction has been conducted especially in developing countries in past few years with the growth of microfinance institutions in these countries. There is wide range of evidence that suggests that microfinance increase income, increase business profits and lift the people out of poverty. In contrast there are studies which supports the contrast view that microfinance

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[3]UN has declared 2005 to be the international Year of Microcredit and Mohammad Yunus has received the Nobel Peace prize in 2006.

programs are successful in reducing poverty in few regions like Asia and Latin America but not in every region. This section provides the brief review of the most relevant studies done in this area.

Olivares and Polance (2005) have analysed average outstanding loans used as proxy for depth of outreach, as dependent variable with other explanatory variables like age of institution, lending methodology, sustainability, competition, and gender. Their results reported negative relationship between age and loan size which means that older MFIs give loan of small sizes. Another study conducted by Mersland and Strom (2009) document that average loan size is a main proxy of serving the poorest of the society. They find a positive relationship between average profit and average loan size indicating that the increase size of loan represent increase urge for profit by MFIs. Christen and Drake (2002) show a positive relationship between depth outreach measured by average loan size with profitability. Their study empirically support that MFIs in Latin America are most profitable, as their profitability is the mixture of three properties; large loan size, competition and regulations.

Wagenaar (2012) has worked on institutional transformation and mission drift in microfinance institutions. According to him, there is huge pressure from donors on microfinance institutions to be profitable. Due to this reason some MFIs have transformed from non-profit to profit oriented institutions. He argues that financial sustainability may lead toward less reaching to the poorest of the poor. Results show that transformed MFIs have significantly higher loan size and have lower percentage of female borrowers. This shows that transformation effects outreach that cause deviation from social mission towards profitability. Cull, *et al*. (2011) investigate regulated and non-regulated microfinance institutions. The results show that regulated MFI has high loan size than non-regulated NGO type microfinance institutions. The operating cost increases as loan size decreases by lending to poorer segment. To minimise or absorb this operating cost MFI are more tempted towards better off clients and restrict outreach to poorer segment and increases loan size is reported. Therefore, regulated microfinance institutions are more likely to experience deviation from social mission than non-regulated NGO type institutions.

Rashid, *et al*. (2011) find positive impact of microfinance on poverty alleviation. They show that increased fund, lower interest rate and accessible financial services made microfinance important and effective for poverty reduction. Another study of Zacharias (2008) shows that average cost and efficiency goes in opposite direction. He has addressed the issue of economics of scale in microfinance institutions and finds evidence of scale efficiencies. His study focuses on the operational cost and size relationship finds that bigger firm is associated with smaller cost. The study finds that average loan size and average cost are negatively co-related thus suggesting that increase in average loan and firm size reduces the operational cost.

Robert, *et al*. (2011) examine the tradeoff between outreach and efficiency of MFIs. They find that MFIs operating in countries with good financial development are more efficient. They find that outreach is negatively related with efficiency suggesting that MFIs with small loan size are less efficient. Their findings showed that efficiency can only be obtained when MFI will focus less on poor segment.

Cull, *et al.* (2007) find not a significant relationship between loan size and profitability. For individual lender results reveal that higher profit leads towards lower outreach resulting in crowding out the poorer clients. Village micro banks put more focus on advancing small loans to the very poor and bear high average cost and receive more subsidies. Few individual lending institutions strive best for both profitability and higher outreach to the poor; fulfilling their ultimate promises, but these are exceptional cases. Finally their results showed that MFIs with higher profits lead toward weak level of outreach and kicks out the very poor from financial schemes.

Armendariz and Szafarz (2009) empirical work on Latin America and south Asia show that poverty oriented MFIs may not serving poor neither because of progressive lending nor because of cross subsidisation. It is not only the result of transaction cost but also due to their own mission fulfilling strategy and other region specific characteristics. According to their findings if all loans are identical then transaction cost only affects the number of loans not the size of loan. Secondly if there are two types of clients, poor and unbanked wealthier clients, having different transaction cost then mission drift on the loyalty of MFIs with outreach maximisation objective. Finally MFIs may use unbanked wealthier clients for purpose of cross subsidisation for poor showing strong commitment with outreach.

Ghosh and Tassel (2008) observe that MFIs may drift from their mission and start focusing on profitable less costly borrowers in order to attract more profit oriented investors. Their results show that funded by profit oriented donors charge higher interest rates. According to their findings poverty gap ratio is the reason for not reaching the poor. Higher interest rates are mainly due to very heavy transaction cost that arises when lending small amounts to poor people is observed by Gonzalez (2010). He further states that Microfinance interest rates normally range between 20 to 70 percent per year, depending on the nature of the activity, however they can touch very high level, as high as 90 percent per year. Strom and Mersland (2007) find no significance difference between nonprofit organisation and shareholder owned MFIs in terms of financial performance and outreach. They do not find any evidence that shareholder owned firm produces more better results in terms of outreach or profitability than nonprofit organisations. So their study clearly indicates that it is MFIs own vision and mission that make MFI good or bad at becoming profit orienting or setting maximum outreach as basic objective. They find that group lending is expensive but results in maximum outreach; on the other hand individual lending is better for financial sustainability. In defining the sustainability of MFIs the role of interest rates cannot be under-valued.

Fernando (2006) shows that the Human Development Index (HDI) is a measure that ranks countries on the basis of human development. It has four levels ranging from "very high, "high, "medium", and "low, human development countries. This Index relatively measures of education, literacy, standards of living and life expectancy for countries worldwide. According to Kai (2009) for measuring the impact of economies of scale, another explanatory variable population density has been introduced, the higher value of the index shows, more population concentration. The value can range from 0 (the population would be equally scattered all over county or region) to 100 (all population would be concentrated in one area of the country or region) considering the effect of economies of scale, a higher value of index may lead to reduce the operational costs, thus increasing productivity. Add a line about the findings of HDI and PDP in two studies.

3. METHODOLOGY AND DATA

The poverty is reduced by reaching the poor and long term serving the poor that is possible when MFIs' are financially sustainable, therefore both outreach and financial suitability is investigated in this study.

3.1. Methodological Framework

The main focus of this study is to examine that microfinance institutions are playing their role to reduce poverty. The microfinance institutions objectives include; outreach to the poor and institutional financial sustainability that is long run expected outreach to cut poverty [Zeller, *et al.* (2002) Schreiner (2002)]. The different dimensions of outreach are discussed in the literature Schreiner (2002) and followed by several studies investigating outreach and financial sustainability Mersland and Strom (2008); Woller (2006); Woller and Schreiner (2002) and many recent studies and used by performance evaluation and impact assessment studies by donors like USAID [Mersland and Strom (2008)].

The breadth of outreach indicates the number of poor participate in microfinance program.[4] It is expected that the larger the number of borrowers the better the outreach and more the poorest population is served. The number of active borrowers is used to capture breadth of outreach in the present study. The depth of outreach captures the value of net gain of a borrower as a client of MFI programme and it is based on the argument that outreach must be measured not just by total number of borrowers but on the number of poor borrowers,[5] as their relative level of poverty is also considered. The average loan size has been used as a proxy measure of breadth of outreach and smaller loans indicate poorer borrowers are served, all other things being equal.[6] The average loan size captures the depth of outreach in the present study following Schreiner (2001) and others.

The cost of outreach to an MFI client refers to interest rate paid and other related costs as a result of receiving financial services from MFIs. The cost of outreach is the highest amount the borrower would agree to bear to get the loan [Navajas, *et al.* (2000)]. Therefore, all things being equal, the less the cost of outreach the more clients are willing to borrow. Interest charges are used as a measure of cost to clients [Mersland and Strom (2008) and others].

The Financial sustainability is the ability of MFI to cover all its operating and financing costs from revenue mostly from the return of loans portfolio [Tellis and Seymour (2002) and Thapa, *et al.* (1992)]. The amount of return will depend on the interest rates charged and the volume of loan outstanding which in turn depend on average loan and the number of loans remaining outstanding. This would mean that, all things being equal, the more clients MFIs have that take loans, at the same or higher interest rates the higher the revenue. On the other side the higher the cost incurred to serving its clients would mean a reduced profitability to an MFI. This implies that in order to achieve sustainability, the MFIs that target poorer borrowers must charge higher

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[4]Studies have used the number of borrowers as measures of microfinance breadth of outreach [Mersland and Strom (2008, 2009); Hermes, *et al.* (2008) and others].

[5]Navajas, *et al,* (2000); Hulme and Mosley (1996) and many recent work.

[6]Mersland and Strom (2009); Cull, *et al.* (2007), Adongo and Stork (2006); Hartarska (2005); Woller and Schreiner (2002) and Schreiner (2001).

interest rates [Conning (1999)]. Charging higher interest rates, which could lead to profitability, may however, price the poorest out of the microfinance services and thereby adversely affecting the attainment of the social objective of the MFIs [Morduch (2000)].

Most participants in the informal sector are believed to be women [Liedholm and Mead, (1995)]. Although female are about 50 percent of the world's work force, and contribute about 67 percent of the world's work, but only 10 percent of the world's wages are earned by them and belong 1 percent of its wealth. Most female are doing same work as male do, but females face more poverty within the household than male, but their work is mostly not visible nor paid [Fernando (2006b)]. It is believed that providing credit to the women by MFIs will reduce the poverty of the household.

The following models are estimated to examine the effect of MFI specific factors and country specific factors on the number of active borrows and average loan size. The number of active borrowers indicator of breadth of outreach is adopted by Armendariz, *et al*. (2011) and other studies. Average loan size is also widely.

In Equation (1) AB is the number of active borrowers which measures the breadth if outreach[7] and it is related with the capital structure, average profit, average cost, size of MFI, age of MFI, portfolio at risk. A set of dummy variables include: group lending will take 1 and zero for individual lending, NGO is 1 and zero if MFI has other legal status, operates in rural market take 1 and zero for urban market, regulated take 1 and unregulated zero. To measure country specific difference Human Development Index (HDI) and Population Density per square meter (PDP) are used. HDI is a measure that ranks countries on the basis of human development. It has four levels ranging from "very high, "high, "medium", and "low, human development countries. This Index relatively measures of education, literacy, standards of living and life expectancy for countries worldwide. For measuring the impact of economies of scale, another explanatory variable population density has been introduced, the higher value of the index shows, more population concentration. The value can range from 0 (the population would be equally scattered all over county or region) to 100 (all population would be concentrated in one area of the country or region) considering the effect of economies of scale, a higher value of index may lead to reduce the operational cost.

Due to interdependence of number of active borrowers, average loan size, interest rate and financial sustainability, these four models are estimated simultaneously given below:

$$AB_{it} = \alpha_0 + \alpha_t \operatorname{Pr}ofit_{it} + \alpha_2 Cost_{it} + \alpha_3 Size_{it} + \alpha_4 Risk_{it} + \alpha_5 Cap_{it} + \alpha_6 FSS_{it} + \alpha_7 Age_{it}$$
$$+ \alpha_8 Rural_{it} + \alpha_9 Group_{it} + \alpha_{10} Ngo_{it} + \alpha_{11} \operatorname{Re}g_{it} + \alpha_{12} HDI_{it} + \alpha_{13} PD_{it} + \varepsilon_{it} \quad (4.1)$$

$$ALS_{it} = \beta_0 + \beta_t \operatorname{Pr}ofit_{it} + \beta_2 Int_{it} + \beta_3 Size_{it} + \beta_4 Risk_{it} + \beta_5 Cap_{it} + \beta_6 FSS_{it} + \beta_7 Age_{it}$$
$$+ \beta_8 Rural_{it} + \beta_9 Group_{it} + \beta_{10} Ngo_{it} + \beta_{11} \operatorname{Re}g_{it} + \beta_{12} HDI_{it} + \beta_{13} PD_{it} + \varepsilon_{it} \quad (4.2)$$

$$Int_{it} = \gamma_0 + \gamma_t \operatorname{Pr}ofit_{it} + \gamma_2 ALS_{it} + \gamma_3 Size_{it} + \gamma_4 Risk_{it} + \gamma_5 Cap_{it} + \gamma_6 FSS_{it} + \gamma_7 Age_{it}$$
$$+ \gamma_8 Rural_{it} + \gamma_9 Group_{it} + \gamma_{10} Ngo_{it} + \gamma_{11} \operatorname{Re}g_{it} + \gamma_{12} HDI_{it} + \gamma_{13} PD_{it} + \varepsilon_{it} \quad (4.3)$$

$$FSS_{it} = \delta_0 + \delta_t \operatorname{Pr}ofit_{it} + \delta_2 Cost_{it} + \delta_3 Size_{it} + \delta_4 Risk_{it} + \delta_5 Cap_{it} + \delta_6 ALS_{it} + \delta_7 Age_{it}$$
$$+ \delta_8 Rural_{it} + \delta_9 Group_{it} + \delta_{10} Ngo_{it} + \delta_{11} \operatorname{Re}g_{it} + \delta_{12} HDI_{it} + \delta_{13} PD_{it} + \varepsilon_{it} \quad (4.4)$$

[7]As indicator of breadth of outreach is adopted by Armendariz, *et al*. (2011) and other studies.

The six regions are expected to be different in depth of outreach, its breadth, women outreach, cost of outreach and financial sustainability as indicator of future outreach. Therefore all four models reported above are estimated by including regional dummies. Among the six regions: Eastern Europe and central Asia. South Africa, South Asia, East Asia and Pacific, Latin America and the Caribbean, and Middle East and north Africa, the Eastern Europe and central Asia is taken as base category.

As this study uses the information for 382 microfinance institutions belonging to six regions over the period for the period 2006 to 2012, the panel data estimation technique is suitable for this purpose. Empirical researches on possibly encounter two sources of discrepancies, missing variables and endogeneity biases and these models have simultaneity as well. The generalised method of moment GMM estimator is more suitable as it deals with the problems. The generalised method of the moment model suggested by Arellano and Bond (1991) and modified by Blunder and Bond (1998) is used as the estimation technique. The lag explanatory variables are used as instruments and the Sargen test is used to test the validity of the instrumental variables.

3.2. Data

The data has been collected for 382 Micro finance institutions, located in 70 countries throughout the six regions of the world including: The six regions Eastern Europe and Central Asia, South Africa, South Asia, East Asia and Pacific, Latin America and the Caribbean, and Middle East and North Africa. The data is on annual basis covering the period 2006 to 2013. The data is from Microfinance Information Exchange (Mix) which is an authentic source providing uniform data all over the world.

4. EMPIRICAL RESULTS

The effect of microfinance institution specific and country specific factors that influence outreach to the poor and being financial sustainability that is expected outreach of these instructions in the long run to cut poverty. The panel data is used and generalised method of Moments of Blunder and Bond (1998) is applied as estimation technique. The analysis begins with the distribution of MFIs among different regions, type, regulated or unregulated and on the country level are presented in Table A1, A2, A3 and A4 in Appendix respectively.

The results of factors determining the breadth of outreach are reported in Table 4. 1. The cost per borrower has negative and significant effect on total number of active borrowers in almost all regions and worldwide. Therefore, as cost increases MFIs serve less borrowers by giving larger loans to fewer clients. This is also consist with the Yunus (1999) observation that increasing cost may reduce micro loans to the core poor clients. The results also confirm by other studies including Mersland and Strom (2009). The age of an MFI has positive impact on number of active borrowers which is significant for almost all regions and also collectively indicating mature firm have more active clients. The large sized of MFI serve more active borrowers in all regions and collectively. The risk of repayment is inversely related to breadth of outreach but significant in Eastern Europe, Latin America and in world. Regulated firm have less clients but negative relationship is significant in South Asia, Latin America and in all regions together. Group

lending relative to individual has positive effect in Africa, Latin America and worldwide showing that group lending increase the breadth of outreach When MFIs operate in rural markets the number of client increases and this increase is significant in Eastern Europe, Africa, Latin America and overall in six regions. Capital structure has no impact on the breadth of outreach. Increase in human development, population density also increases client served but this relationship is significant in South Asia and worldwide. The results show that financial sustainability is positively and significantly related with the total number of active borrowers in South Asia, Latin America and Eastern Europe and overall regions. This means as increase in the number of borrows increase sustainability. The result is also in line with the results of Logotri (2006) but in contrast with Marsland and Storm (2008).

The results reported in Table 4.2 are the factors that affect depth of outreach measured by average loan size. The result shows that an MFI is able to earn higher profit when loan size is larger. This is in conformity with Yunus (1999) argument that big loan size creates more profit and this thing crowd out the poorer clients from credit scheme [Christen and Drake (2002)]. The loan size increases with increase in cost significantly in Latin America and worldwide, MFIs are needed to increase efficiency to minimize cost and to avoid mission drift. When an MFI is efficient, its cost is low and loan size is also small. This result is also in line with the cost findings of Mersland and Strom (2011), Freixas and Rochet (2008). The results indicate that average loan size increases as size of the MFI increases in all regions. This result is supported by Mersland and Strom (2011). MFI maturity has positive impact on loan size and significant for South Asia, Middle East, Latin America and worldwide. The results show that financial sustainability has positive and significant effect on average loan size. As average profit increases loan size also increases and as average profit decreases average loan size also decreases. The result is consistent with the findings of Mersland and Strom (2011) and Freixas and Rochet (2008) model.

Table 4.1

Results of Determinants of Breadth of Outreach Measured by
Number of Active Borrowers

	East Asia & Pacific		Eastern Europe & central Asia		Middle East & North Africa		South Africa		South Asia		Latin America & Caribbean		All world	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	3.40	1.37	-3.62*	-9.14	7.49	8.73	7.30*	8.46	-2.14*	-1.81	-3.75*	-9.59	1.38*	6.27
AGE	0.06*	2.45	0.01	0.40	0.05*	2.02	0.06*	2.35	0.02**	1.74	0.01	0.47	0.02*	4.95
CAP	0.14	0.24	0.19	1.33	0.51	1.03	0.73	1.50	0.34*	3.31	0.19	1.35	0.55*	7.49
GROUP	-1.42*	-3.16	0.12*	2.26	-0.19*	-2.96	-0.23*	-3.02	-0.30	-1.48	0.12*	2.29	0.40*	7.41
REG	-0.01*	-1.87	-0.18*	-2.94	-0.09	-0.27	0.17	0.56	0.30***	1.77	-0.19*	-3.03	-0.03***	-1.76
NGO	0.03	1.35	0.14***	1.76	0.03**	1.77	0.17**	1.71	0.21*	2.11	0.09*	3.11	0.18*	3.14
RISK	-0.51	-1.37	-0.67*	-5.28	-0.69	-1.21	-0.40	-1.03	-0.16	-0.61	-0.64*	-5.24	-0.18*	-4.21
FSS	-0.21	-0.90	0.81*	4.58	-0.97	-0.82	-0.50	-0.62	0.50*	1.84	0.18*	4.59	0.61*	2.55
SIZE	0.22*	5.45	0.77*	4.86	0.22*	5.41	0.21*	5.16	0.60*	17.34	0.77*	5.02	0.55*	8.26
Cost	0.96*	3.14	0.51*	3.85	0.32*	3.41	0.19*	2.77	0.08*	2.94	0.51*	3.92	0.73*	5.00
Rural	0.29	0.93	0.37*	6.65	0.06	0.17	0.05	0.13	0.39	0.70	0.37*	6.67	0.42*	6.81
Profit	-0.69*	-2.21	0.35*	8.14	-0.42*	-1.97	-0.79*	-1.98	-0.23	-1.25	0.32*	7.88	-0.05	-0.44
HDI	6.65***	1.71	0.04	0.12	0.67	0.69	0.47	0.48	0.64*	2.87	0.22	0.62	2.02*	11.41
PDP	0.01	1.29	0.02	-0.19	0.01	1.28	0.01	1.40	0.01*	3.27	0.01	0.26	0.02*	7.21
R^2	0.48		0.46		0-50		0.49		0.45		0.40		0.49	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

Table 4.2

Results of Determinants of Depth of Outreach Measured by Average loan size

	East Asia & Pacific		Eastern Europe & central Asia		Middle East & North Africa		South Africa		South Asia		Latin America & Caribbean		All world	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	-1.77	-1.60	1.18	2.29	0.52	3.87*	0.11	0.30	-0.18	-0.32	2.56*	10.95	0.41*	4.65
AGE	0.02	1.15	0.01	-0.03	-0.01	-2.91*	0.04	3.17*	0.01	0.86	0.01*	2.26	0.01*	3.26
CAP	-0.76*	-2.54	0.23	0.98	-0.15	-1.56	0.11	0.46	-0.07	-0.33	-0.39*	-3.25	0.09*	1.90
GROUP	0.06	0.21	0.15*	1.90	0.23	2.96*	-0.14	-0.67	-0.25*	-2.56	-0.11*	-2.46	-0.11*	-3.33
REG	-0.38**	-1.73	0.03	0.37	0.08	1.39	0.24	1.59	0.09	1.15	0.15*	3.04	0.22*	6.60
NGO	-0.03***	-1.75	-0.02**	-1.84	-0.33	-0.831	-0.19*	2.46	-0.02**	-1.79	-0.05*	2.75	0.16*	2.44
RISK	-0.28	-0.13	-0.39	-0.50	0.05	0.07	-1.40	-0.68	0.53	0.50	0.77*	3.74	0.42*	2.37
FSS	-0.02	-0.01	1.34**	1.83	0.17	0.36	-1.45	-1.14	-0.07	-0.16	-0.99*	-2.68	-0.07	-0.45
SIZE	0.09*	5.02	0.01	1.07	0.02	2.82*	0.01	0.94	0.01	1.58	0.05*	12.15	0.05*	16.70
INT	-0.82*	-5.25	0.07	0.39	-0.03	-0.18	-0.06	-0.13	-0.41	-1.20	-0.12	-1.10	-0.17*	-1.98
Rural	-0.34*	-1.93	-0.06	-0.66	-0.26	-3.61*	-0.20	-1.06	-0.16	-0.90	-0.10*	-2.05	-0.14*	-3.65
Profit	0.88	1.30	-0.44	-1.52	-0.17	-0.73	-0.39	-0.63	-0.01	-0.09	-0.59*	-3.86	-0.29*	-3.71
HDI	1.92	1.01	-0.81	-1.12	-0.17	-0.96	0.38	0.80	0.88	0.79	-3.82*	-11.84	-0.72*	-6.80
PDP	0.01*	3.71	0.02*	-2.59	0.00	-5.15*	0.00	-1.22	0.01	-1.11	0.02*	-6.40	0.01*	-5.12
R^2	0.43		0.44		0.38		0.35		0.35		0.32		0.39	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

The cost of outreach to an MFI borrowers is captured by real interest rate paid and other related costs as a result of receiving financial services from an MFI. The real interest has two sided affects; interest rate provides financial support and income to the MFI and on the other hand it increases cost of a loan facility to the poor. It inhibits the poor from accessing financial services. There is a relation between cost and interest rate. It is expected that increasing cost will increase the interest rate in order to cover the cost and be financially sustainable on the one hand [Dlamini (2012)]. On the other hand, the less the cost of outreach the more borrowers are willing to get loan from the microfinance and smaller are loan size other things being equal. [Mersland and Strom (2008)]. The results of determinants of interest rate that is measure of cost of outreach are displayed in Table 4.3. The results show that in all six regions and worldwide average loan size is inversely related with interest rate. Higher cost leads to less reaching the poor. Sustainability is positively related to interest rate. Size of MFI does not affect the interest rate in all regions but in all regions together it has small but positive and significant effect on interest rate. Risk of repayments negatively impact interest rate except Eastern Europe. Capital structure, group lending compared to individual, rural market compared to urban and regulation are not significant contributors of cost of outreach. PDP and HDI have no role on the interest rate charged from borrowers.

In Table 4.4 presents the results of factors contributing to financial sustainability. The results indicate that the cost per borrower reduces the financial sustainability of the MFIs as suggested by the accounting theory that costs reduce profitability. This result is also supported by Conning (1999) that MFIs with higher costs per dollar loaned are less profitable and therefore, less financially sustainable. As the case of type of lending group lending has positive effect on sustainability and this is supported by the theory that MFI prefers group lending that ensures repayment and increase financial sustainability. This finding is in line with Hartarska (2005); Mersland and Strom (2009); Armendariz and Morduch (2007); Cull, *et al.* (2007). It is expected that mature MFIs to be more sustainable than younger ones, but results indicate that the age of an MFI is not related to its financial sustainability. The results show positive relationship between MFI size and

Table 4.3

Results of Determination of Interest Rate as Measure of Cost of Outreach

	East Asia & Pacific		Eastern Europe & central Asia		Middle East & North Africa		South Africa		South Asia		Latin America & Caribbean		All world	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	-0.39*	-2.38	0.33*	2.73	-0.02	-0.31	0.01	0.03	0.03	0.32	0.32*	4.77	0.13*	6.46
AGE	0.01*	3.67	0.01	-1.23	0.01*	2.63	0.01*	2.56	0.01	-0.79	0.01*	-2.28	0.01	-1.12
CAP	-0.07	-1.59	0.07	1.29	-0.08**	-1.87	-0.08**	-1.86	-0.12*	-3.37	0.03	0.76	-0.01	-0.45
GROUP	-0.05	-1.26	-0.02	-1.25	0.01	0.24	-0.01	-0.37	-0.02	-1.15	-0.01	-0.68	-0.01	-1.13
REG	-0.01	-0.24	0.01	0.31	0.08*	2.88	0.08*	2.72	0.02	1.34	-0.01	-0.69	-0.01**	-1.77
NGO	0.02**	1.77	0.13*	2.73	0.04**	1.85	0.01***	!.75	0.04*	1.92	0.20*	1.97	0.13*	2.56
RISK	0.74*	2.30	-0.28	-1.49	0.99*	2.70	0.93*	2.55	-0.10	-0.56	-0.24**	-1.82	-0.05	-1.28
FSS	0.18	0.88	0.33**	1.89	0.34	1.46	0.03*	2.00	0.10	1.40	0.21*	2.03	0.14*	3.98
SIZE	0.01*	1.35	0.02	-0.81	0.01	0.02	0.01	0.51	0.02	1.43	0.01	0.95	0.01*	3.93
ALS	-0.06*	-5.25	-0.01*	-2.39	-0.01	-1.78***	-0.01	-0.28	-0.01	-2.20	-0.01	-1.80**	-0.01*	-1.98
Rural	-0.01	-0.48	0.02	0.73	0.01	0.28	0.01	0.29	-0.01	-0.38	0.01	0.68	0.03*	3.38
Cost	0.71*	8.87	0.26*	3.85	0.83*	9.71	0.84	9.77	0.02	1.17	0.07	1.66	0.01*	5.24
HDI	0.49**	1.82	-0.20	-1.18	-0.10	-1.14	-0.10	-1.11	0.11	0.63	-0.19	-1.97	0.03	1.13
PDPSM	0.02*	4.37	0.01	-1.60	0.01	-0.98	0.01	-1.08	0.02**	1.88	0.02	-1.31	0.02*	-3.47
R^2	0.68		0.54		0.59		0.59		0.55		0.54		0.55	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

Table 4.4

Results of Determination of Financial Sustainability as Measure of Future Expectation of Outreach

	East Asia & Pacific		Eastern Europe & central Asia		Middle East & North Africa		South Africa		South Asia		Latin America & Caribbean		All world	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	-4.25	-1.50	-0.12	-0.62	-0.31	-0.49	-0.41	-0.66	0.87*	3.00	0.28*	2.49	0.30	3.48
AGE	0.02	0.72	0.01	0.79	0.02	-0.18	0.01	0.30	0.02	-0.96	0.01	-0.96	0.01*	-2.83
CAP	0.20*	3.58	0.10	1.13	1.23	2.89	0.32*	3.09	0.31*	2.71	0.12*	2.20	0.25*	8.76
GROUP	-0.20*	2.47	0.04*	2.15	0.06***	1.77	0.01	1.83**	0.04*	2.78	0.05*	2.48	0.02*	2.16
ALS	0.30*	1.90	0.05*	2.28	0.10***	1.73	-0.09	-0.59	-0.02	-0.53	-0.04*	-3.16	-0.08*	-2.32
REG	0.29	0.64	-0.10*	-0.32	0.08	2.11	0.21	0.81	-0.06	-1.54	-0.07*	-3.02	-0.04*	-2.04
NGO	0.06	0.28	0.09	0.55	0.03	0.32	0.19*	2.49	0.01**	1.85	0.04	0.38	0.10**	1.87
RISK	-3.29	-0.94	-0.18	-0.66	-1.55	-0.44	-1.49	-0.42	-1.05	-1.54	0.13	0.59	-0.36*	-3.36
SIZE	0.09*	1.99	0.06*	2.11	0.04	1.44	0.03	1.27	0.06*	11.92	0.01*	7.09	0.05*	7.91
AB	-0.29*	-3.16	0.27*	4.09	0.80*	2.15	0.77*	2.16	0.20*	2.93	0.31*	7.05	0.01	0.83
INT	-0.19	-1.21	-0.07	-0.95	-1.16**	-1.84	-0.90	-1.05	-0.14	-0.85	-0.08	-1.53	0.01	0.22
Rural	-0.54*	-1.91	0.03	0.86	-0.24	-0.75	-0.34	-1.03	0.06	0.68	-0.03	-1.22	-0.04	-1.53
Cost	-0.17	-1.50	0.28*	2.39	-0.15	-2.10	-0.57	-0.54	-0.22*	-5.23	0.10	1.34	0.16	1.98
HDI	11.81*	2.58	0.18	0.69	0.22	0.27	0.36	0.44	-1.58*	-2.84	-0.29**	-1.88	0.05	0.04
PD	0.01*	2.51	0.01	-0.11	0.03	0.71	0.01	0.51	0.02	-0.39	0.01*	-1.99	0.02***	1.72
R^2	0.42		0.45		0.49		0.40		0.42		0.47		0.47	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

their financial sustainability that is contradiction with findings by Hartarska (2005), but in confirmation with Mersland and Strom (2009); Kyereboah-Coleman and Osei (2008); Cull, *et al.* (2007). The number of active borrowers which measures the breadth of outreach improves the financial sustainability of microfinance institutions that is consistent with the results of Logotri (2006). The repayment risk decreases the financially sustainable as expected. The rural market participation has no role of financial sustainability. The financial sustainability is positively related to interest rate and negatively to average loan size. The MFI size and experience makes MFI more financially sustainable. The capital structure, rural market, group lending are positive contributors indicating that in most of the regions and around the world financial sustainability and outreach has trade off.

This goal of microfinance to reach and empower women as majority of the world's poor is women and work in informal sector. It is believed that providing credit to women would reduce the poverty level of the household. The results show that group lending, rural market, capital structure, risk and financial sustainability, MFI size, population density have positive impact on women outreach. Age has no effect on reaching the women and has effect on all regions together. Regulated MFI target not to the poorest section as collateral is required, therefore these MFIs have less women client and HDI has positive effect. The results lead to conclusion that in case of women financial sustainability and outreach are met simultaneously to some extent.

The results of different measures of outreach are estimated by using regional dummies along with other determinants. The results show the fact that the smaller is the size of loan, the higher is the interest charged on these loans. According to Cull, *et al.* (2007) a simple indicator is average loan size showing that the small size of loans symbolise that MFI is targeting poor customers and help in declining poverty [Cutler (2010) and Rosenberg, *et al.* (2009)].The variable for breadth outreach by number of active borrowers and women borrowers has also shown significant positive impact on poverty reduction [Hermes, *et al.* (2009)]. As regard result of lending type shows that those MFIs who mostly lend to group compared to individual generally charge significantly low rates of interest so the cost of outreach is higher [Cull, *et al.* (2008)] showing that group lending increase outreach and reduce poverty. The results of control variables are almost same as obtained in above tables. The MFIs who are operating in South Africa, South Asia, East Asia and Pacific, Latin America and the Caribbean, and Middle East and North Africa have less financial suitability but more active borrowers, women borrowers, average loan size, charging relatively high interest rates as compared to Eastern Europe and Central Asia MFIs with exception of South Asia that is charging lower rate.

Table 4.5

Results of Determination of Women Outreach

	East Asia & Pacific		Eastern Europe & central Asia		Middle East & North Africa		South Africa		South Asia		Latin America & Caribbean		All world	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	0.32	1.14	0.17*	2.40	0.53*	3.42	0.53*	3.45	0.39	1.62	0.14*	1.92	0.10*	3.13
AGE	0.01	0.67	0.01*	3.66	0.02	0.12	0.02	0.18	-0.01*	-5.52	0.03*	3.68	0.01	0.06
CAP	0.04	0.34	0.18*	4.77	0.02	0.22	0.01	0.11	0.52*	5.91	0.17*	4.73	0.04*	2.02
GROUP	0.03*	2.32	0.04*	3.29	0.13**	1.81	0.13	2.41	0.01*	2.22	0.05*	3.33	0.13*	10.63
REG	0.06	0.76	0.10	0.65	0.04	0.76	0.05	0.86	0.07	0.25	0.10	0.66	0.16*8	1.80
NGO	0.07*	2.35	0.01*	1.99	0.04**	1.86	0.48*	2.35	0.02*	1.78	0.12***	1.73	0.21*	2.37
RISK	-0.35**	-0.81	-0.20**	-1.85	-0.56	-1.62	-0.79***	-1.66	-0.39***	-1.69	-0.20*	-1.84	-0.35*	-5.17
FSS	0.88***	1.61	0.69*	6.05	0.82***	1.69	0.81***	1.67	0.14**	1.77	0.69*	6.02	0.74*	12.51
SIZE	0.02*	2.50	0.02*	13.43	0.02*	3.01	0.02*	3.26	0.06	4.74	0.02*	13.55	0.02*	20.70
Profit	0.56*	2.66	0.02	0.69	0.45*	2.13	0.52*	3.27	0.07	1.28	0.02	0.71	0.02	0.04
Rural	-0.21	3.01	0.11*	7.68	0.16**	1.88	0.16*	1.90	0.01	0.13	0.11*	7.67	0.09*	6.55
Cost	-0.04	-0.15	0.72*	5.24	0.13	0.49	0.32*	1.98	0.07**	1.83	0.72*	15.08	0.36*	12.14
HDI	0.80	3.91	0.27*	2.78	0.13	0.64	0.13**	1.72	0.54*	1.79	0.23*	2.30	0.22*	5.33
PDP	0.01	-1.11	0.02	-0.40	0.01	-0.62	0.01	-0.57	0.01*	3.28	0.01	0.08	0.01*	6.05
R^2	0.34		0.35		0.36		0.35		0.32		0.37		0.38	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

Table 4.6

Results of Regional Differences in outreach

	Interest Rate		Average Loan Size		Active Borrowers		Women Borrower		Financial Sustainability	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
C	0.15	10.20	0.09	1.34	-0.39**	-1.82	-0.06	-1.66	0.41*	4.41
AGE	0.01***	-1.73	0.01*	2.96	0.01*	3.46	0.01*	-1.94	0.02**	1.80
CAP	-0.02	-1.40	0.02	0.40	0.30*	4.44	0.12*	6.41	0.22*	7.47
GROUP	0.01***	1.63	-0.12*	-3.76	0.15*	3.00	0.11*	8.90	0.01	0.69
REG	-0.01	-1.04	0.21*	6.08	-0.18*	-2.70	-0.03*	-2.50	0.01**	1.78
NGO	0.07*	2.32	-0.02**	-1.75	0.03**	1.79	0.02*	11.72	0.05**	1.76
RISK	-0.07**	-1.88	-0.28***	-1.63	-1.16*	-4.70	-0.37*	-5.50	-0.09	-3.79
SIZE	0.01*	4.28	0.04*	14.36	0.54*	5.46	0.03*	5.50	0.29*	2.69
Avgls	-0.01*	-2.78							0.05*	7.47
INT			-0.24*	-2.78	0.36*	6.38	0.12*	8.26	0.01*	1.34
Rural	0.03*	2.86	-0.18*	-4.70	0.03*	2.86	0.12*	8.26	-0.04	-0.69
Profit	0.07*	4.00	0.40*	5.58	0.83*	4.09	0.58*	10.23	0.01*	2.26
HDI	0.03***	1.73	0.72*	6.80	0.01	2.05	0.06**	1.81	0.08**	1.85
PD	0.02*	3.47	0.01*	5.12	0.01*	2.93	0.01*	2.50	0.01	0.33
DAF	0.02	0.23	0.17*	3.13	1.33*	13.90	0.09*	3.59	-0.17	-3.99
DEAP	0.04*	2.46	-0.05	-0.72	1.71*	15.67	0.24*	8.18	0.10	1.98
DLAC	0.02***	1.78	-0.11*	-2.37	0.55*	7.84	0.05*	2.67	-0.18	-5.50
DMENA	0.04*	2.67	-0.33*	-4.48	1.29*	12.51	0.13*	4.72	-0.13	-2.71
DSA	-0.08*	-6.14	-0.46*	-8.20	2.15*	23.26	0.34*	14.31	-0.17	-3.82
	0.52		0.50		0.51		0.53		0.54	

Note: The * indicates significance at 1 percent, ** significance at 5 percent and *** significance at 10 percent.

5. CONCLUSIONS

The main objective of this study is to examine that microfinance institutions are playing their role to reduce poverty. The poverty is reduced by reaching the poor and long term serving the poor that is possible when MFIs' are financially sustainable, therefore both outreach and financial suitability is investigated in this study by conducting a cross region analysis of 382 MFIs covering six regions of the world. In this study two approaches are used for estimations, conducting estimations for four measures of outreach (breadth, depth, cost, and expected future outreach) for each of the region separately and for the world as a whole, first. Second for robustness check the results of different measures of outreach are estimated by using regional dummies along with other determinants.

The results show the fact that the smaller is the size of loan, the higher is the interest charged on these loans. According to Cull, *et al.* (2007) a simple indicator is average loan size showing that the small size of loans symbolize that MFI is targeting poor customers and help in declining poverty. The reason is that well off customers are not attracted in small loans and in line with the results of Cutler (2010) and Rosenberg, *et al.* (2009). The variable for breadth outreach by number of active borrowers and women borrowers has also shown significant positive impact on poverty reduction [Hermes, *et al.* (2009)]. As regard result of lending type shows that those MFIs who mostly lend to group compared to individual generally charge significantly low rates of interest so the cost of outreach is higher Cull, *et al.* (2008) showing that group lending increase outreach and reduce poverty. MFIs lending type group lending have low rate and no collateral compare to individual, who on average charge lower cost of outreach (interest rates). Nonprofit institutes are more actively meeting the objective of reaching poor and taking participants

out of poverty The results of other factors like MFI size, capital structure, MFI size, profit are positive and risk, regulation, are negative and significant contributor of outreach generally in all regions. The results support that providing credit to large number of active borrowers and women would reduce the poverty level of the household. The overall results of the study indicate that as depth of outreach is inversely related with the cost of outreach and positively with sustainability. However, breadth of outreach has significant positive relation with cost of outreach and sustainability. These results indicate that in most of the regions and around the world financial sustainability and outreach has trade off. The implications of these results is that it is required both outreach and sustainability, as in order to survive in future, microfinance industry should be sustainable by reducing its transaction, operational and administrative cost against its lending interest rate and average profit.

APPENDIX

Table A1

MFIs on Regional Basis

S.No.	Region	Frequency	%
1	East Asia and the pacific	20	5.235
2	Eastern Europe and central Asia	74	19.372
3	Middle east and north Africa	22	5.759
4	South Africa	56	14.660
5	South Asia	49	12.827
6	Latin America and the Caribbean	161	42.147
	Total	382	100

Table A2

MFIs on the Basis of Legal Status

S.No.	Legal Status	Frequency	%
1	Bank	36	9.424084
2	Credit union/cooperatives	41	10.73298
3	NBFI	140	36.64921
4	NGO	165	43.19372
	Total	382	100

Table A3

MFIs on the Basis of Lending Type

S.No.	Lending Types
1	Group lending
2	Individual lending
3	Village banking

Table A4

MFI on the Basis of Countries

S.No.	Country	No.of MFIs	S.No.	Country	No. of MFIs
1	Albania	3	36	Kyrgyzstan	5
2	Angola	1	37	Lebanon	1
3	Argentina	2	38	Mali	3
4	Armenia	4	39	Magnolia	1
5	Azerbaijan	10	40	Morocco	7
6	Bangladesh	4	41	Mexico	13
7	Benin	4	42	Moldova	1
8	Bolivia	24	43	Mongolia	2
9	Bosnia and Herzegovina	9	44	Montenegro	1
10	Brazil	6	45	Mozambique	1
11	Bulgaria	2	46	Nepal	6
12	Burkina Faso	1	47	Nicaragua	14
13	Cameroon	2	48	Nigeria	3
14	Chile	2	49	West Bank and Gaza	1
15	Colombia	11	50	Pakistan	4
16	Cambodia	11	51	Palestine	2
17	Costa Rica	1	52	Paraguay	4
18	East Timor	2	53	Peru	38
19	Ecuador	28	54	Philippines	4
20	Egypt	6	55	Rwanda	2
21	El Salvador	3	56	Republican Dominica	2
22	Ethiopia	6	57	Russia	7
23	Gambia	1	58	S Africa	3
24	Georgia	6	59	Senegal	5
25	Ghana	3	60	Serbia	2
26	Guatemala	6	61	Sudan	1
27	Guinea	1	62	Tajikistan	6
28	Haiti	2	63	Tanzania	5
29	Honduras	2	64	Togo	2
30	India	35	65	Trinidad & Tobago	1
31	Indonesia	1	66	Tunisia	1
32	Jordan	3	67	Uganda	4
33	Kazakhstan	6	68	Uzbekistan	3
34	Kenya	9	69	Vietnam	2
35	Kosovo	6	70	Venezuela	1

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