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ABSTRACT

This study sheds light on the mission drift arguments for 149 MFIs working in continent Asia over the period 2003 to 2013. The mission drift is captured by average loan size, total number of borrowers and lending rate. The study finds positive and significant relationship of average loan size with average profit and cost. These results indicate that increase in loan size results in increase in cost and this reduces outreach. The result shows that high subsidy uncertainty increases the interest rate and reduces the outreach of MFIs suggesting that subsidy must be less uncertain to avoid mission drift. The study also finds that subsidy uncertainty increases the average loan size, therefore core poor are not served. The implications that emerged from findings are that cost efficiency is very important, as cost efficiency increases, loan size becomes small, which ultimately fulfil the promise of maximum outreach to the core poor clients. The findings suggest for subsidy donors and Government need to make more clear policies regarding the disbursement timing and amount of subsidy. This will reduce the ambiguity about subsidy in MFIs and let them work more confidently on their mission.

Keywords: Microfinance, Subsidy Uncertainty, Outreach, Mission Drift, Sustainability

1. INTRODUCTION

Since the start of microfinance in Bangladesh, it has been viewed as a source of poverty reduction. After successful progress of Grameen bank in Bangladesh, microfinance surprisingly made its way to other undeveloped and less developed economies. It is seen as to relegate poverty in those areas where other financial institutions are reluctant to go. The objective of microfinance is to provide financial services especially micro loans to the very poor, in order to help them in promoting their living standards and to make them able to earn enough through micro entrepreneurs and small business.

Recent studies are concerned with the extent to which the MFIs are not meeting their primary social objectives, this phenomena is known as "mission drift". In mission drift MFIs deviate from their responsibility of fulfilling their objectives and put focus on profitability, sustainability of their own; which results in deviation of financial facilities from very poor clients to less poor clients; thus reducing the "outreach". As microfinance industry is maturing, it has faced much criticism regarding its deviation from the "mission of serving the very poor". According to the founder of Grameen bank and microfinance Muhammad Younus, "clients who have better financial position push out poorer clients in any financing scheme".

Financial sustainability is also important for any institution or industry. According to *MicroBanking Bulletin* (2006) containing information from MIX website about 704 MFIs reveal that 41 percent of the total MFIs are not financially self-sufficient, such MFIs rely on other funding options such as donors aid and Government subsidies. In the last 36 years, the success and growth of microfinance industry is remained very positive. In past, the first microfinance institution has started working as an NGO, but currently as more and more banks are entering in this industry so now MFIs are more regulated then before. These new incumbents in the microfinance industry are attracted due to much profit opportunities; due to this trend of commercialisation emerged in the industry. During 1990's many donor oriented MFIs transformed in formally regulated microfinance banks.

In July 2008, *Financial Times* has reported the same thing, "the commercialisation of MFIs." In August 2009, *the Wall Street Journal* has published that microfinance industry is a profitable industry for institutional investors. Prodem was a non-government MFI which was commercialised and ownership was transformed in shareholder by Banco Sol in 1992. Recent initial public offerings have provided a good sum to people which have increased the

debate of MFIs operations drifting towards more profitability. The argument is that high profit leads toward mission drift and less outreach, as when MFIs go for profit by lending out to less poor clients then in real they are drifting from primary objective of "serving the very poor".

The main purpose of study is to analyse whether microfinance institutions working under the umbrella of serving the poor are actually fulfilling their mission or somehow drifting from it. The present study examines the mission drift in microfinance and what factors are actually responsible for this mission drift. Cull, *et al.* (2007) has used average loan size as the proxy for mission drift. This study also uses the same variable and also includes another variable number of active borrowers to capture mission drift and outreach as well. The factors responsible for mission drift are taken from the previous empirical literature are average profit, average cost, subsidy uncertainty, MFI age, MFI size [Paxton, *et al.* (2000); Cull, *et al.* (2007); Ammendariz, *et al*. (2011) and others].

The present study is different in sample size and specifically oriented towards mission drift. Although critics have shown their worry about the mission drift in microfinance institutes, but little work is done in this direction. In this study, Asia is selected as sample region because in this region MFIs is fastest growing industry. Some parts of the region like South Asia consist of developing countries where poverty is high and side by side availability of funds is very low. The problem of interdependence of interest rate, profit and outreach is dealt with simultaneous equation model. The issue of uncertainty regarding subsidy is also addressed. Both average loan size and outreach are used to measure proxy for mission drift. Therefore, the present study is definitely be a good source of understanding the phenomenon of mission drift and its relation with different other factors that causing it for Asian countries.

This study is aimed to highlight the factors that cause mission drift, which ultimately help the MFIs, donors, Government and other stake holders to evaluate and improve their performance. Adding subsidy uncertainty in model along with average profit and average cost will further provide a clarification that how subsidies can be used to improve the performance of MFIs and what is the role of subsidy uncertainty in the operations of MFIs.

Microfinance industry is a growing sector in mostly third world countries with the mission of reducing poverty. Currently MFIs are noticed as deviating from their primary goal of poverty reduction and maximum outreach; focusing more on profitability. This consideration towards profitability is pushing out the ultimate poor from obtaining the benefits of microfinance facilities. Therefore, mission drift phenomena are emerged as major problem of microfinance industry. The main objective of present study is to analyse that whether MFIs are drifting away from their mission of providing loans to the core poor by using number if credit clients and average loan size as proxy of outreach. The study

also examines role of subsidy uncertainty in deviating MFIs from their mission or other factors are responsible for all this.

After introduction, the remainder of the study is organised as follows. The overview of role of subsidy is presented in Section 2. Section 3 reviews the relevant empirical literature in this area. The theoretical framework and hypothesis development is provided in Section 4. Section 5 deals with methodological framework and data. The empirical results and interpretation is discussed in Section 6 and last section concludes the study and presents policy implications.

2. THE OVERVIEW OF SUBSIDY ROLE IN MICROFINANCE INDUSTRY

There are normally two types of microfinance institutions namely microfinance institutions which are working as not for profit entity and other which are working as for profit earning entity. These all institution depends highly on subsidies from donors and other aid agencies. Especially NGOs mostly run their schemes with the subsidies funded by donors. According to Morduch 1999s estimates, Grameen bank alone received USD 175 million during 1985-1996 in form of subsidies. This indicates the importance of subsidies in the operations of microfinance institutions. Excessive subsidisation is the issue of debate from 80s. The debate is mostly on transparency, time horizon and regulations regarding subsidies are started. To cover up this, a notion of small subsidies is adopted by MFIs. Subsidies are source of simultaneous pursuance of social and financial objectives. When we look at subsidies with an optimistic view, we say that subsidies are much important for MFIs in operating at fair basis. In the competitive market environment, if MFIs are compelled to reduce their cost or prices, subsidies, then, is a source for cost coverage thus helps in avoiding mission drift. On the other hand, MFIs which heavily depend upon subsidies may face another problem known as "subsidy uncertainty." Subsidy uncertainty is a scenario where the timing and volume of subsidy is uncertain. As most of the MFIs heavily depend on donors 'grants for smooth operations. Thus, subsidy uncertainty may push MFIs towards profitability and wealthier clients for their own self sustainability. The relationship between subsidy uncertainty and mission drift is first checked by Armendariz, *et al.* (2011). Subsidy uncertainty may be a reason of mission drift. MFIs relying on subsidies for their operations are subsidy sensitive. If subsidy is not delivered by donor in time, MFIs may face hurdles in fulfilling their promises. In such a situation a MFI may drift towards larger average loan size in order to earn profit for self-sustainability. This motivates to examine the impact of subsidy uncertainty on the mission drift in Asia where MFIs is most growing industry in the world.

Recently, it is observed that MFIs become more directed towards profits at the expense of services to the poor. Here the argument is that higher profit leads towards less outreach which brings a kind of simultaneity. Although some researchers [Rhyne (1998) and Christen and Drake (2002)] have found that more commercialised MFIs are more competent to serve the poorest clients, as more profit enhance their efficiency and willingness to serve poorest. Profit earning is not the objective of MFIs. For addressing the issue of mission drift it is better to consider profit and cost of MFIs. According to Paxton (2000) there is a tradeoff between profitability and outreach. These two are simultaneously affecting each other. Serving the poorest clients pushes back the self-sustainability and if self-sustainability is considered at first, it hinders the services to the poorest clients. The end point that creates the difference (in debate of profitability and outreach) is that smaller size loans have a higher transaction cost while large size loans have a low transaction cost, which urges MFIs to shift towards larger loan size to less poor clients.

Microfinance has been started in late mid-1970s; it emerges and become a valuable source for poverty alleviation. The microfinance is developed by the international donor agencies like international fund for agriculture development, Deutche Gesellshafi in Asia and United States agency for international development funds. Microfinance provides small size loans to a huge number of borrowers. Large numbers of transactions increase the operating cost of the MFIs. Microfinance mission is to reduce poverty. In fulfilling this mission, MFIs have to bear high costs. This is the reason that mostly MFIs rely on the subsidies from the donors and international agencies. The most prominent name in microfinance is Grameen Bank. According to the Morduch (1999)'s findings Grameen bank was receiving about USD 175 million for 1985 to1996 alone. There are similar stories about other MFIs as well.

Subsidies are helpful in the dual mission of MFIs. Dual mission includes social and financial results [Conning (1999) and Copestake (2007)]. Subsidies help in reaching a large number of poor, giving them small size loans with low interest rates. Reaching a large number of core poor people with small size loans justifies the subsidies [Zeller and Meyer (2002)]. Subsidies are helpful when there is much pressure on MFIs to reduce their cost or increase their profit by giving large size loans, in order to be stable in competitive environment. In such conditions subsidy is the most valuable source to avoid mission drift. There is always a risk of mismanagement of subsidies due to management inefficiencies which does not produce the desired results of maximum outreach [Bhutt and Tang (2001)]. Excessive subsidisation is also not good and donors and other researchers are stressing on small subsidies with specific time intervals and amounts.

Microfinance institutions heavily rely on the subsidies for their operations. In Latin America these cases are well documented. The design of subsidies matters a lot in the performance of MFIs. The timing and amount

of subsidy is very important. If there is uncertainty regarding the time and amount of subsidy, it may create hurdles in smooth operations of MFIs. Uncertainty may create a fear of financial problems in running the institution. To cover this problem MFIs may go towards larger loan size. Thus uncertainty may divert MFIs towards maintaining their financial sustainability regardless of their primary objective of reducing poverty. NGOs receive most of the subsidies, individual lending MFIs receive fewer subsidies and rural microfinance institutions receive large portion of subsidies, [Cull, *et al*. (2009)]. Previous studies show the impact of subsidies on the performance of MFIs. Hudon (2010) has reported that subsidies have little effect on the performance of management. Nawaz (2010) has found that subsidies increase the financial efficiency of MFIs. Hudon and Traca (2010) show that subsidies play an important role in the efficiency and performance of MFIs and very important in smoothly fulfilling mission, although this is true up to a threshold level above which it negatively affects the efficiency. However subsidies are an important source of cheap funds for MFIs and their role is vital in the efficiency and performance of MFIs. The present study on the role of subsidy uncertainty on mission drift provides a good understanding of factors that contributes to drifting the MFIs from their core mission though it is restricted by the data limitations. Notwithstanding with it, this study tries to provide a better image that how subsidies are related with the mission of microfinance.

3. LITERATURE REVIEW

There is large body of literature on how microfinance institutions alleviate poverty in the when this industry started and latter with commercialisation this industry is deviating from its mission. This section provides the review of most relevant literature in this area.

Christen and Drake (2002) made an analysis of MFIs working in Latin America with a sample of 200 institutions. The issue of commercialisation was firstly discussed in Latin America by comparing return on assets of which was 1.4 percent of one institution in 1996-1999 and other institution has negative 4.5 percent for the same period. They found commercialisation is the mixture of three properties; profitability, competition and regulations. Consequences of commercialisation reported by Christen and Drake was that regulated MFIs give large size loans, which shows focusing on profitability; evidence of mission drift. Another study by Olivares and Polance (2005) using sample of 28 Latin America MFIs tried to investigate some of Christen and Drake (2002) findings. They used depth of outreach and breadth of outreach, and found that older MFIs gave loan of small size; lower (large) competition leads towards small (large) loan size and finally there exist tradeoff between profitability and depth of outreach.

Mersland and Strom (2010) examined mission drift in microfinance for 374 rated microfinance institutes from 74 countries from 1998 to 2008. They used average loan size, lending methodology, main market and gender as proxy of mission drift. In their study a positive relationship is found between average profit and average loan size; average cost and average loan size. The average loan size increases with increasing cost and profit. The risk remains unpredictable in their work. They found no evidence of mission drift, as increased profit is offset by increased cost. Therefore, this apparently increase in loan size does not increase profitability in real.

Wagenaar (2012) 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 nonprofit to profit oriented institutions. He argued that financial sustainability may lead toward mission drift. Results showed that transformed MFIs have significantly higher loan size and have lower percentage of female borrowers. This showed that transformation effects outreach, thus his findings were transformation cause mission drift. He showed that commercialisation is not a positive sign in microfinance industry, when they transform they experience mission drift.

Cull, *et al*. (2011) showed that regulated MFI has high loan size than non-regulated NGO type microfinance institutions. According to his findings, supervision cost increases as loan size decreases. MFI has to bear supervision cost as a result of lending to poorer segment. To minimise this supervision cost MFI more tempted towards better off clients. Restrict outreach to poorer segment and increases loan size is reported. MFIs try to keep their profit at the same level, so regulated microfinance institutions are more likely to experience mission drift than non-regulated NGO type institutions.

Franco (2011) said that microfinance tried to bridge this gap by providing financial services to very poor people of economy who, otherwise have no access to financial opportunities. Franco (2011) tried to prove that microfinance still has an important effect on poverty reduction. In the same way there are for profit MFIs whose solitude purpose is to earn profit only, but this should not be generalised to whole industry. He found that in Latin America and Caribbean so MFIs increased and grew, they provide more opportunities to poor have to up lift their living standards.

In the success of every business, governance stands as the highly important ingredient. Such a relationship is explored by Argentina (2005) by checking the significance of governance and performance. He analysed the relationship between outreach and self-sustainability in MFI of Eastern and Central Europe and newly independent states. The result indicated the an independent board, separate from the management of company is very important for outreach of MFI and its sustainability with sacrificing outreach limited effect

of auditing, rating and supervision by central bank authorities was also reported by his study. Results showed that donor representatives on board increases out reach.

Subsidy is an important aspect of microfinance institutions. Nearly every MFI relies on aid from donor for meeting its cost in order to become an efficient poverty reducing MFI. Although, 23 percent MFIs in the world are unsubsidised, thus, they are not relaying on aid for meeting their expenses and costs. The social performance of subsidised and unsubsidised MFI was compared by Hudan, *et al*. (2013).This sample was divided into four zones regarding their geographical basis. They found the subsidies are important for better social performance. Further study found that unsubsidised MFI use different ways to be financially sustainable. There approaches vary from region to region. Asian and African MFI, which do not receive subsidies, charge high interest rates while Eastern Europe and central Asia MFIs in Latin America, which are not relaying on subsidies, tended to give less loans to female borrower. The results of their study showed that subsidy is an important element for efficiently fulfilling social mission without going for profit motives. Otherwise MFIs have to seek ways to be financially sustainable.

Schreiner (2002) did a valuable work and provided aspects of loan size that must be observed before making any loan as large or small. The study discussed seven aspects of a loan size, named as term to maturity, dollars disbursed, average balance, dollars per instalment, time between instalments, and number of instalments and dollar-years of borrowed resources. These all aspects did not only affect the depth of outreach but also the profitability of MFIs. According to study, when loan size was viewed from one dimension, all other dimensions or aspects were ignored. Thus a true measure for loan size was a multiple of these aspects. His study found that the best measure of loan size is dollar years of borrowed resources. This measured the purchasing power given by the loan and did consider all the other six aspects, which is the most valuable character of dollar years of borrowed resources. His study provided us with best insights in the loan size and explored with aspect is more important while marking loan size as large or small.

Rosengard (2004) concluded that being commercialised or profit oriented did not mean that MFI has shifted from their social mission, instead both profit oriented and social services go in the same direction, thus enhancing each other as they are complementary for each other. His study overall supported commercialism or profit orientation for creating a sustainable microfinance industry. Rashid, *et al*. (2011) used agent based modelling for pre-policy implementations testing the effect of microfinance. The study found positive impact of microfinance on poverty alleviation. It showed that increased fund, lower interest rate and accessible financial services made microfinance important and effective for poverty reduction.

Zacharias (2008) showed that average cost and efficiency goes in opposite direction. He found strong evidence of scale efficiencies. The study reported that bigger firm is associated with smaller cost, thus efficiency increases when firm size is large. The study found 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 and ensure the benefit of economics of scale and efficiency.

Armendariz, *et al*. (2011) argued that subsidy uncertainty may leads towards mission drift. They said that MFI serves the poor borrowers at one hand, but they must be financially sustainable on the other hand. If the supply of subsidy is uncertain from donors, MFIs may drift towards average larger loan size and lower outreach. Impact of subsidies was analysed on poverty reduction, which was proxied by interest rate, average loan size and outreach with 230 MFIs operating in 60 different countries from 1999 to 2006. A significant positive relationship was found between subsidy uncertainty and high interest rate. More subsidies results in lower loan size. There was found a negative relationship between subsidy uncertainty and outreach. So this paper suggested that subsidy uncertainty is a reason of failure in attaining dual objectives of MFIs. If subsidy is designed better, under clear rules and time of deliverance, microfinance institution can be able to fulfil their mission more easily.

Robert, *et al*. (2011) tried to analyse the tradeoff between outreach and efficiency of MFIs as well as good financial development is more efficient for 435 MFIs from 1997 to 2007. They found that outreach is negatively related with efficiency that meant 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. Thus they revealed that commercialisation results in more efficiency, hence reducing focus on poorer segment.

Cull, *et al*. (2007) examined trade off relationship between profitability and depth of outreach for 124 MFIs from 49 different countries. The relationship between loan size and profitability was found insignificant. For individual based lender results higher profit leads towards mission drift; showed that these institutions can earn higher profits at the cost of crowding out the poorer clients (less outreach). 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, they concluded that recent commercialisation trend in detrimental for poor clients as it increases loan size and kicks out the very poor from financial schemes.

Armendariz and Szafarz (2011) for Latin America and South Asia showed that poverty oriented MFIs may deviate from their mission because of

transaction cost but also due to their own mission fulfilling strategy and other region specific characteristics. Their work revealed that there is very little difference between cross subsidisation and mission drift. A slight movement towards profitability may transform cross subsidisation into mission drift. 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 mission.

Ghosh and Tassel (2008) showed that MFIs may drift from their mission and start focusing on profitable less costly borrowers in order to attract more profit oriented investors. He used large loan size as proxy for mission drift and their result showed that funded by profit oriented donors charge higher interest rates. According to their findings poverty gap ratio is the reason for mission drift as poverty gap ratio depends upon poverty estimation line so it was somehow controversial. Moseley (1996) found that MFIs for their self-sustainability may drift towards wealthier clients at the expense of poor clients by offering larger loan size. Since that loan size is widely used as proxy for mission drift. Moseley explained the case of Bolivia Ban Cosol in which same situation occurred. Hudan and Traca (2010) come out with the result that subsidy has a minor effect on the quality of MFIs management. They concluded that subsidy affects the efficiency of MFIs majority in their sample; but this efficiency is increased till a threshold level. Nawaz (2010) also came up with a positive relation between subsidy and financial efficiency; even though marginally.

4. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

The latest school of thought of banking to the poor considers the complexities initiated by information asymmetries and the risk between the borrower and lender. It impacts the smooth stream of demand and supply of capital because of high transaction cost and other risk associated with lending to poor, which are reported in previous case studies on microfinance institutions [Zeller and Johansson (2006)].

Life cycle theory of microfinance framed by Bogan (2009) creates links between stage of development of MFI taking into consideration the following factors, operational sustainability, capital structure and overall out reach of MFI. In this framework, it is possible to measure sustainability in terms of financial and operational aspects. Here operational aspects are relating to revenue generated covering the cost of sanctioning loans demanded. Financial sustainability relates with the outer aid; the amount of subsidy required to run its operations.

Now, coming towards the main plight of mission drift, the common assumption is that "to continue smooth operations, MFI needs to be self-sustainable". It implies that if MFI has budget to finance its operations after meeting necessary costs, it is better able to meet its mission of poverty alleviation and maximum outreach. Otherwise it may have to stop its operations. Thus either serving the initial target demography or shifting towards a new demography depends upon the profit considerations. Focusing on profitability of MFIs enables us to analyse the mission drift argument.

Suppose an MFI which is risk averse in its operations with an exponential utility function following Keenedy and Raiffa (1976) given as:

$$u(\pi) = -e^{-\rho\pi} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

Here π shows the profitability of a microfinance institute and ρ represents the risk averse behaviour. The expected utility function of profit can be rewrite as following when the profit is normally distributed,

$$E\big(u(\pi)\big) = u\left(\pi - \tfrac{1}{2}\rho\sigma^2\right) = u(P) \quad \dots \quad \dots \quad \dots \quad (2)$$

Where *P = profit of MFI, σ = risk associated with profit*

The Equation (1) shows that in order to maximise utility, MFI should maximise its profit.

Now extending the model given in Equation (1) following the model of Monti-Klein:

$$\pi(D,L) = (r_L - r)L + (r(1-a) - r_D)D - C(D,L) \quad \dots \quad \dots \quad (3)$$

Where *r_L = lending rate, r_D = deposit rate, r = interbank market rate, D = deposits, a = percentage of reserves for compulsory reserves, $C(D,L)$ = management cost*

The profit of the bank is the difference of lending and borrowing rates after adjusting costs. The vulnerability of profit depends upon the intermediation margins of lending and borrowing rates, supply of cash (deposits), demand for loans, repayment ratio of loans and management cost risk.

For MFIs, which constitutes the semi-informal financial structure, different arguments can be out lined. Firstly MFIs may be able to maintain their lending and borrowing rate fix, still when the rate in interbank market is varying. This is possible when there is only a single MFI working in a demographic area. So it has some monopolistic power and able to adjust the lending and borrowing rate; de-effecting the changes in rates in interbank market. In this scenario, MFI is able to control its own risk [Freixas and Rochet (2008)]. One thing that can be added here is, "relationship banking is characteristic of microfinance industry; where customers are locked with microfinance institutions" [Sharpe (1990); Rajan (1992); Mersland (2009)].

Secondly management cost is related with the salary of employees working with institutes, but it is, to much extent, predictable, so it comprises of very small risk.

Thirdly, the main risk associated with microfinance industry and most important factor in smooth operations is repayment of loan amount. This is the main concern of MFI while sanctioning loans. Although poor mostly repay their loan amounts, but MFIs have adopted several lending techniques to reduce uncertainty regarding repayment of loan. MFIs mostly disburse loans of small sizes with short maturity periods, to individuals with good reputation and record. Other method involves disbursement of loan to a group, so the members of group control each other [Ghattak and Guinnane (1999)].

So taking into consideration the repayment risk

$$P = (r_L - r)L + (r(1-a) - r_D)D - C(D,L) - \frac{1}{2}\rho\sigma^2(L) \quad \ldots \quad (4)$$

Now ρ is constant and is the risk adjusted profit of MFI. Assuming that management cost is a linear function and rearranging the equation and dividing by the total number of clients, the equation becomes

$$L(average\ loan) = \frac{1}{r_L - r}\frac{P}{CC} - \frac{(r(1-a)-r_D)}{r_L - r}\frac{D}{CC} + \frac{1}{r_L - r}\frac{C(D,L)}{CC} + \frac{1}{2}\rho\sigma^2(L) \quad (5)$$

The right hand side of Equation (5) is representation of risk adjusted profit, credit risk per borrower, management cost and deposits. Left hand side shows average loan size which is used as proxy for mission drift. If we look at the model, it anticipates that average loan size will inflate with higher management cost, risk per borrower, higher profits and with lower deposits. In this case intermediation margins (difference between lending and borrowing rate) remain unchanged for average cost and average profit. So it is clear that if signs are equal then the value of coefficient may make either average profit or average cost more important variable for consideration. Now take Equation (5) for further testing.

The thought about mission drift is that MFIs for their own financial sustainability moves towards larger loan size, thus shifting towards better off clients. This is hypothesis of mission drift.

Risk per client is important. All MFIs are concerned firstly with risk of client. Repayment mode is made satisfactory before signing any contract of loan. If MFIs feel advancing loan to a client is risky, one would expect that MFI will lower its loan size.

The Equation (5) includes risk per client, average cost, average profit and management cost as independent variables. There are additional variables affecting the average loan like time variable shows the age of MFI or period since it has started its operations.

To provide theoretical support for modelling of subsidies and mission drift, the following models are considered.

Let an MFI that is serving two types of unbanked clients or, equivalently, offering two types of loans, 1 and 2, respectively. Loan 1 is the loan that is given to the poor and its size at time *t*, $s_1(t) > 0$. Loan 2 is the loan given to wealthier *y* but unbanked clients whose minimum requirement for starting a business is (t: $s_2(t) > s$). This project can only be financed by the MFI. The interest rate charged is exogenously fixed to ρ.

In period $t > 0$, the MFI receives a stochastic subsidy $K_t \geq 0$, and provides $N_1(t)$loans of type 1 and $N_2(t)$loans of type 2. It faces transaction costs $f(N_1(t), N_2(t))$ depending on the number of both types of loans. This function is assumed linear. Relative to wealthier clients, it is assumed that the poor are more costly to serve:

$$f(N_1, N_2) = g_1 N_1 + g_2 N_2,\ g_1 \geq g_2 > 0 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

The MFI's main objective is to maximise outreach via microloans. That is, the MFI maximises expected utility, which is a function of the MFI's outreach objective, that is, to extend the largest number of loans to poor clients. The MFI controls the size of each type of loans $S_1(t)$ and $S_2(t)$, subject to the budget constraint. Regarding dynamics, future utility is discounted by factor $\beta \leq 1$. The utility function is assumed additive, and future utility is discounted with an exponential factor:

$$U[N_1(1),..., N_t(t),...] = \Sigma\, \beta^t U[N_t(t)] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

where $U[.]$ is an increasing concave function.

It is assumed that the subsidy received by the MFI, t *K*, is the only stochastic variable in the model. The dynamics of the decision-making process is:

At time 1, the MFI receives subsidy 1 *K*, and allocates this subsidy as follows: it extends loans partly to poor clients (N_1 (1) loans) and partly to wealthier clients (N_2 (1) loans). The MFI maximises expected utility, which delivers an optimal outreach level N_t (1). At the end of period 1, all loans are reimbursed delivering a return, $\rho > 0$.

At time 2 and beyond, resources available to the MFI are made of a new subsidy (e.g., K_2) and the net profit of its lending activity. These resources arise from lending activity between the MFI and poor clients (e.g., $N_1(2)$ loans) and partly from lending activity with wealthier clients (e.g., N_2 (2) loans) through expected utility maximisation. The resulting model is:

$$\underset{S1(t),S2(t),N1(t),N2(t)}{Max} \quad E \sum_{t=1}^{\infty} \beta^t \cup [N_1(t)]$$

$$s.t.\ K_1 = s_1 N_1(1) + s_2 N_2(1) + \gamma_1 N_1(1) + \gamma_2 N_2(1)$$
$$K_{t+1} + (1+\rho)[s_1 N_1(t) + s_2 N_2(t)] = s_1 N_1(t+1) + s_2 N_2(t+1) + \gamma_1 N_1(t+1)$$
$$+ \gamma_2 N_2(t+1),\ t > 0\ s_1(t) \geq 0;\ s_2(t) \geq \underline{s}, \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

It follows that, given that outreach is to be maximised, the MFI will always offer the smallest possible loans to the poor: ¥$_t$: S_1 (t) = 0. Let us denote by C_t the cost of serving N_1 *(t)* poorer clients at time *t*:

$$C = \text{ɤ}_1 N_t(t)$$

and let us define accordingly:

$$U[N_1(t)] = V[C_t]$$

The function V [.] benefits from the same properties than U [.]. Namely, V [.] is increasing and concave, with: $V[C_t] = \text{ɤ}_1.U[\text{ɤ}_1 N_t(t)]$.

Loans to wealthier clients appear as a profitable side-business that do not contribute to the MFI mission directly, but offers additional capital for reaching the poor. The rate of return of this business is constant. Indeed by lending one dollar at the cost of ɤ$_2$ to a wealthier client the MFI generates (1+ρ) dollars.

The positive rate of return of this activity is defined by:

$$(1+\rho)/\text{ɤ}_2 = 1+r \Rightarrow r = (1+\rho-\text{ɤ}_2)/\text{ɤ}_2 > 0$$

Importantly, rate r is used by the MFI for investing, not for borrowing.

With these conventions, model rewrites:

$$\text{Max } E \sum \beta^t V[C_t]$$
$$\text{s.t. } W_{t+1} = (w_t - C_t)(1+r) + K_{t+1},\ t > 1$$
$$C_t \geq 0,\ t > 0$$
$$W_t - C_t \geq 0,\ t > 0$$

Where, W_t represents the financial assets of the MFI at t after subsidy and before lending to any borrower.

Here model suggests that a typical MFI can finance its outreach maximisation objective in two ways: (1) it obtains external subsidies, and (2) it launches a profitable side business. The latter could in principle involve any kind of profitable activity. However, it is believed that it is natural to suppose that the MFI's side business is financial, because of economies of scale considerations, for example. Specifically, extending loans of a larger size to wealthier clients can be the profitable business to generate income by MFIs. Because lending to the unbanked wealthier clients involves a transaction cost, 2 *g*, the charged interest rate r is not a rate of return. The actual rate of return, which takes into account transaction costs, is:

$$r = 1 + \rho - \text{ɤ}_2/\text{ɤ}_2$$

This rate is positive for as long as lending to wealthier clients is profitable.

In most consumption models, the same interest rate is applicable to saving and borrowing. However, focus here is on the lending side, and therefore excludes borrowing as a side activity.

4.1. Hypotheses Development

The following hypotheses are formulated to achieve the objectives of the study based on previous empirical literature and theoretical framework

H1: Subsidy uncertainty is the source of mission drift.

This hypothesis is based on following hypothesised relationships:

- There is positive and significant relation between average loan size and subsidy uncertainty.
- There is positive and significant relationship between subsidy uncertainty and interest rate.
- Total number of active borrower is indirectly and significantly related with subsidy uncertainty.

H2: Average profit is the reason of mission drift.

This hypothesis is based on following hypothesised relationships:

- There is positive and significant relation between average loan size and average profit.
- Total number of active borrower is indirectly and significantly related with average profit.

H3: Average cost is the reason of mission drift.

This hypothesis is based on following hypothesised relationships:

- There is positive and significant relation between average loan size and average cost.
- Total number of active borrower is indirectly and significantly related with average cost.

5. DATA AND METHODOLOGY

In this section, data, variables and econometric methodology is discussed in detail. Data type, source, data span are described. Variables are defined and their measurement is discussed. Models and estimation techniques which are used for the analysis are explained.

5.1. Data

The study is using panel data obtained from the financial reports of microfinance institutions, Microfinance Mix Information Exchange website from year 2003 to 2013. The data is collected for 149 MFIs working in 20 different countries in Asia for those MFIs which have five stars or four stars rating. The reason of using high rating data is that, the data is reliable and

available for multiple years. The sample under this study includes different types of MFIs. It includes NGOs, NBFIs, Rural Banks and Banks. Data contains data of firm size, firm age, interest rate, etc. The data is different in its nature, the natural logarithm to normalise the data.

5.2. Variables Construction

Following is the definition of variables and definitions used in this study. These variables are extracted from the previous empirical literature presented in section two.

Average Loan Size

The depth of outreach is captured by average loan size in most studies. Average loan size is also widely used in assessing the performance of microfinance industry. Average loan size is also linked with the profitability of MFI. This variable is also used by Cull, *et al*. (2007); Bhutt and Tang (2001); Schreiner (2002) in their study. Mersland and Strøm (2010) used average loan size as proxy for mission drift. Average loan size is used as the proxy variable for mission drift. In this study large average loan size represents that MFI is deviating from its mission.

Average Loan size = total value of loans/ total number of borrowers

Total Number of Active Borrowers

This variable is used as the indicator of outreach in the study of Armendariz, *et al*. (2011). In this study, this variable is also used as proxy for outreach. This variable is the total number of active borrowers during a year that have availed the loan facility from MFI. This variable represents the depth of outreach. Increase in total number of active borrower shows that MFI has increased its outreach and social mission is achieved.

Average Profit per Borrower

Average profit per borrower is used to assess the profitability of MFI. Net annual profit figure is obtained from the financial statements of MFIs and it is divided by the total number of borrowers. Here average profit per borrower shows that whether an MFI is going towards its profitability or it is more focused on its social mission. The average profit represents the profitability of institution and hence important to include in the study. This variable is calculated as:

Average profit per borrower = net annual profit / total number of borrowers

Average Cost per Borrower

Average cost shows the efficiency of institution. The lower cost increases the efficiency of MFI and also smoothens the way towards more outreach and

results in increased focused on social mission. Net annual operating cost is obtained from financial statements and it is divided by total number of borrowers to calculate the average cost per borrower. Financially self-sustainable of MFI means that MFI should cover its cost from its revenues. This is included in in the analysis because cost plays a very important is the operations of MFIs and also leads towards social or profit earning mission. Average cost is used in prior studies of financial institutions by Yuengert (1993) and Gutierrez-Nieto, *et al*. (2007). This variable is calculated as:

Average cost per borrower = net annual operating cost / total number of borrowers

Size of MFI

Total Assets and total equity in natural logrithm is also used for size of MFI. Size of MFI is associated with the operations of MFI. MFI grows in its size, it becomes more financially stable and thus it can easily fulfil its social mission of providing loans to the poor community. Size is an important determinant of microfinance mission, as size affects the loan size and profitability of MFIs.

Portfolio at Risk > 30 Days

Portfolio at risk constitutes that part of total loan portfolio that is overdue by 30 days. This is a type of bad debts that are not received by 30 days. Portfolio at risk is very important in performance efficiency and profitability of MFI. As this risk increases MFIs will be reluctant to sanction loan to the core poor clients because their profitability is affecting by non-repayments. Risk increases the cost of operations; it creates hinders in smooth performance of institution. Due to its effect on profitability and performance, it is included in analysis.

Real Interest Rate

Real interest rate determines the profitability of MFIs and the flow of funds in the economy [CGAP (2009b)]. Interest rate is related with the performance of MFI. Interest rate is the rate charged on loans by MFIs. As a determinant of revenue, the interest rate yield is included in the analysis [Ledgerwood (1999)]. This rate has an effect on the borrowers. Mostly interest rate is determined by the market forces of supply and demand. Sometime government intervenes and creates an upper ceiling for the interest rate. This affects the economy and creates a gap when government sets a concessionary interest rate. This makes MFIs to depend on government and other donors agencies. In this study real interest rate is used for analysis, which is equal to nominal interest rate minus the rate of inflation. Dlamini (2012) also use this variable in his study. Real interest rate is used because it is the benchmark rate for institutions and they make policies on the basis of real interest rate.

Subsidy Uncertainty

Subsidy uncertainty is the uncertainty about the timing and amount of subsidy which is given by donors to MFIs. Mostly microfinance institutions depend upon subsidies for their operations. Subsidies play very important role in fulfilling their social goals when cost of transactions is high. It covers that extra cost which is incurred due to small loans to the poor people. So its enables MFIs to stay stick with their core mission of poverty alleviation. Subsidy uncertainty is calculated as standard deviation of denoted equity divided by the total equity. Denoted equity is the equity with is given as subsidy to the MFIs. This variable is calculated in two steps. Firstly Denoted equity is divided by total equity. Then standard deviation is calculated on moving average basis.

$$\text{Subsidy uncertainty} = \text{S.D of} \quad \frac{\text{Denoted Equity}}{\text{Total Equity}}$$

5.3. Methodological Framework

The methodology of the analysis for explaining the mission drift consists of three models and each of them carries its own estimation technique with panel data.

5.3.1. *Mission Drift Model*

Mission drift in microfinance institutions is checked by using two main proxy variables. First average loan size is used as proxy variable for mission drift. Cull, *et al*. (2007) also used this variable in their study for checking mission drift phenomena. Second variable which is used as proxy for catering mission drift is total number of active borrowers, [Armendariz, *et al*. (2011)]. The first model takes average loan size as proxy of mission drift and examines the factors that affects loan size

$$lnavls_{it} = \beta_0 + \beta_1 lnavp_{it} + \beta_2 lnavc_{it} + \beta_3 lnsu_{it} * D1 + \beta_5 lnta_{it} + \beta_6 par30_{it\_} + u_{it} \text{-------(M1)}$$

Where

Lnavls = average loan size
lnavp = average profit
lnavc = average cost
lnsu = subsidy uncertainty
D1 = dummy variable to isolate the subsidy dependent and independent MFIs and takes value of 1 and 0 respectively.
Lntai = total assets of MFI
par30 = portfolio at risk > 30 days.

In first model of mission drift, the relation of average loan size with average profit, average cost, size of MFI, subsidy uncertainty and risk variable is

examined. A binary dummy variable is used to isolate the subsidy dependent and independent MFIs. Average profit and loan size are related, Schreiner(seven aspects of loan size). The expectations are that as loan size increases profit of MFI also increases which leads MFI away from its social mission [Mersland and Storm (2010)]. Average cost is also related with the loan size of MFI. Increasing cost increase sustainability risk for MFI [Dlamini (2012)]. Cost represents the efficiency of operations. MFI has to bear its operational cost incurred from running its operations. Each additional transaction increases cost of MFI and MFI has to made very small transactions (micro loans). Thus cost has a very significant role in the operations and performance of MFI. This is because that cost is added in the model specification. Subsidy uncertainty may increase the risk of sustainability. Subsidies provide financial support to the operations of MFIs. Increasing uncertainty may urge MFIs to increase their loan size in order to earn profit for their sustainability and operations. Thus subsidy uncertainty may be the reason of mission drift [Hudon (2010)]. The size of the institutions matters a lot in its profitability and performance. The size is catered by total asset value. As MFIs increases it operations, its assets increases in the form of account receivables. Assets are important in efficiencies that are why asset is added in the model.

The number of active borrowers is used as proxy of mission drift in second model and examines the factors affecting number of active borrowers.

$$lntacbi=\gamma_0 + \gamma_1 lnavpi + \gamma_2 lnavci + \gamma_3 lnstdev*D1 + \gamma_5 lntai + \gamma_6 par30i + u_{it} \quad (M\text{-}2)$$

Where all other variables remain the same. lntacbi = total active borrowers

In second model of mission drift, total number of active borrowers is used as main mission drift variable. The explanatory variables include average profit, average cost, subsidy uncertainty, size of the MFI and portfolio at risk more than 30 days. Total number of active borrowers is used by other studies for assessing mission drift [Armandariz, *et al.* (2011)].

Total number of borrowers shows the operating activity of MFI. In subsidy uncertain world, profit is very important for sustainability. Profitable loans and non-profitable loans are important when subsidy uncertainty increases; MFI has a pressure to maintain its operations and remains sustainable. So in the fear of dry up of subsidy, the prediction is that as subsidy uncertainty increases total number of active borrowers decline. Cost is also linked with the number of borrowers. Number of transactions is associated with the number of borrowers. Each transaction adds up in the cost of business. In microfinance sector small loans are given to a large number of borrowers. Thus the cost is associated with the number of borrower. The size of MFI is added in the specific to check whether they have any effect on the outreach of microfinance institution. Portfolio at risk determines that part of loan portfolio that is overdue by 30 days. It represents the possible risk of loss. As this risk increases, MFIs

has to bear cost and its profit declines. So in a tough competitive environment, portfolio at risk outlines MFIs strategies for further borrowers.

Estimation Technique

Both of these two models include average loan size, average cost, average profit and portfolio at risk. These variables are determined simultaneously with each other. The relation between these variables may create an endogeniety bias, which may affect the results. To check whether the relationship suffers from endogeniety, Hausman test of endogeniety is applied and test confirms the endogenous relationship between average loan size and average profit and secondly between average loan size and average cost as the p-value is less than 0.05. Therefore instrumental variable technique of Generalised Method of Moments (GMM) is used to perform estimation by panel data. This technique is good when there is problem of endogeniety. The GMM estimators are known to be consistent, asymptotically normal, and efficient in the class of all estimators that do not use any extra information aside from that contained in the moment conditions. GMM estimation allows for arbitrary heteroskedasticity and serial dependence when the time period is small and numbers of MFIs are large [Woolridge (2002)]. In this study, there are 149 MFIs and time period is 11 years. To tackle endogeniety, GMM provides an option of using instrumental variables. Instrumental variables are used to remove endogeniety bias. Lagged dependent and independent variables are used as instrument variables. In addition to the total assets, total equity is an alternative variable for size of the MFI.

In this study, two types of effects of panel data estimation are used to check the relationship between dependent and independent variables. Fixed effect panel data and random effect panel data estimation methods are used here. In this study, firstly, mission drift regressions are estimated by using GMM estimation technique. To check whether random effect method or fixed effect method is appropriate, Hausman (1978) test is applied. Here null hypothesis states that the random effect is consistent and efficient while alternative states that the fixed effect is consistent and efficient. Hausman test of random effect is used. On the basis of the results of the Hausman test, this study finally reports its results using fixed effect method.

5.3.2. *Real Interest Rate Model*

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. The interest rate variable is determined by the operating cost, size and subsidy uncertainty. 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 [Dlamini (2012)]. Subsidy and interest rate are also related with each other. As available funds always has an effect on interest rate. As uncertainty about subsidy increases, it creates a pressure on MFI management for performing its operations and remains financially sustainable, [Hudon, *et al*. (2010)]. As uncertainty about the timing and amount of subsidy increases, it increases the fear of maintaining currently running programs and sustainability as well. This is because it is expected that increasing Subsidy uncertainty also push the interest rate upwards, [Armendariz (2011)]. Size is also related with the interest rate. Operational efficiencies and size are positively related, [Zacharias (2008)]. This variable is introduced in the regression equation as control variable in model 3.

$$R_{it} = \alpha_0 + \alpha_1 \ln Stdev_{it} * D1 + \alpha_2 \ln tei_{it} + \alpha_3 \ln avci_{it} + \varepsilon_{it} \qquad \text{(M-3)}$$

Where all other variables are same as in Model-1 and

R_{it} = Real interest rate
$lntei_{it}$ = size
$lnavci_{it}$ = operational cost

Real interest rate is the dependent variable and independent variables include subsidy uncertainty, size of the MFI and operating cost. Here subsidy uncertainty, size of MFI and operational cost are used in their natural log form. A binary dummy variable is used to isolate the subsidy dependent and independent MFIs.

Estimation Technique

Simple ordinary least square technique is applied to check the relations between dependent and independent variables.

5.3.3. *System of Simultaneous Equation*

A system of simultaneous equations is to check the robustness of the estimates The reason of using simultaneous equations is that in this study, average loan size is determined with average profit, average cost and risk. Average loan size affects average profit, average cost and risk. In the same way average profit, cost and risk affects the average loan size. This creates a simultaneous relation between dependent and independent variables [Mersland and Storm (2010)]. Two systems of equations are estimated simultaneously average loan size and average profit is one and average loan size and average profit in second.

The benefit of this approach is to take into account the endogeneity of average loan size, average profit and average cost by allowing the errors of different equations to be correlated. In both of these systems instrumental variables are used. In this analysis, there are as many instruments introduced as

there are right hand side variables in each equation. For valid instruments these need to be uncorrelated with the error term and must be correlated with the explanatory variables. For this reason lagged independent variables appearing in both structural equations are used as instrumental variables.

Estimation Technique

The parameters are estimated by employing the seemingly unrelated regression (SUR) procedure developed in Zellner (1962), Zellner and Huang (1963) and Zellner (1963). This is available in most statistical software.

6. EMPIRICAL RESULTS

This study is aimed to examine the mission drift in microfinance industry of Asia. The analysis begins with summary statistics of the data. Then panel data regression results are discussed.

6.1. Summary Statistics

The Table 6.1 shows summary statistics of variables used in this study. World means are obtained from the *MicroBanking Bulletin* (2008) and Nawaz (2010). These variables are defined in chapter 3 and are in line with the definitions used by MIX and CGAP Hashemi, *et al*. (2005). World mean shows that average loan offered in Asia is lower than the other world. Cost incurred in Asian MFIs is high than the rest of the world. This may be because average loan size is small in Asia than other countries as shown by world mean. The interest rate charged in Asia is less than it is charged in the rest of the world.

Table 6.1

Summary Statistics of Data

	Mean	World Mean	Median	Std. Dev.	Observations
Average Loan Size	5.720601	8.08	5.307719	1.251762	1637
Average Profit	2.629151		2.363868	1.854521	1407
Average Cost	3.586555	1.3109	3.530363	1.37355	1636
MFI Size	16.2246		16.27163	1.860408	1638
Portfolio Risk > 30	0.054592		0.01785	0.186773	1638
Real Interest Rate	0.200396	0.24	0.178933	0.134423	1637
Subsidy Uncertainty	1.620843		1.324423	1.425463	739

Correlation in different variables is presented in Appendix Table A1. Average cost is correlated with average profit. It is also correlated with firm size. However, the correlation coefficients between explanatory variables are rather low. Kennedy (2008) has reported that correlation coefficient should between areas of 0.8 to 0.9 in order to detect collinearity. None of correlation coefficients in the table fall in that area.

Hausman Test of Endogeneity Results

Hausman test of endogeneity is used to check that whether there exists endogeneity in the independent and dependent variables. The result of the test confirms that endogeneity is present between average loan size, average profit and average cost. The results are reported in Appendix Table A2 and A3.

The variable RES01 is the series of residuals obtained by running a simple regression where average profit is dependent variable. Then this series is placed in the model where average loan size is the dependent variable. The series of residuals is significantly associated with average loan size. This confirms the presence of endogeneity between average loan size and average profit. The variable RES02 is the series of residual obtained by regressing average cost on different independent variables. Then this series is placed in the average loan size regression to check the endogeneity. The variable RES02 is significant at 1 percent level. This shows a strong endogenous relation between average cost and average loan size. Thus from results, it is clear that endogeneity is present in the dependent and independent variables. So, ordinary least square estimation technique is inappropriate. For this reason, this study has applied generalized method of moments (GMM) estimation technique to tackle endogeneity by using different instrumental variables.

6.2. Panel Data Regression Results

In analysing the results three different estimation techniques are used on five different regression models. Firstly, mission drift regressions are done, where GMM estimation technique is used. Secondly, on the real interest rate regression model, OLS technique is applied. In this regression model, effect of subsidy uncertainty is checked on interest rate. Thirdly, mission drift regression is run in system of equation using SUR technique verify the robustness of results.

6.2.1. *Mission Drift Regression Results*

The main objective of this study is to check the mission drift in the operations of the microfinance institutions. Two proxy variables average loan size and total number of active borrowers are used for mission drift. For this purpose two different models are run. GMM estimation technique is used in both models. Both fixed effect and random effect models are estimated. On the random effect model Hausman test is run to check whether fixed effect is better or random effect is better in explaining the mission drift relationship. The null hypothesis of Hausman test is that the random effect is consistent. The results of Hausman test shown in the Appendix Tables A4, A5 both two models reject the null hypothesis. So random effect is inconsistent and the study runs the estimation using fixed effect method. Both models are estimated using fixed effect method. The estimations results are following:

Table 6.2

Result of Mission Drift Using GMM with Fixed Effect Method

	Average Loan Size	Number of Active Borrowers
Intercept	1.859 **	–1.368 **
	(2.49)	(–1.98)
Average Profit	0.137 **	–0.219 ***
	(1.98)	(–3.45)
Average Cost	0.325 ***	–0.293 ***
	(2.90)	(–2.84)
Subsidy Uncertainty	0.020	–0.0411*
	(0.70)	(–1.87)
MFI SIZE	0.146 ***	0.813***
	(2.61)	(15.73)
Portfolo Risk > 30 DAYS	–0.988	0.275
	(–1.62)	(0.50)
Adjusted R-Squared	0.590	0.592

Note: *** Significant at 1 percent, ** Significant at 5 percent, and * Significant at 10 percent.

The results show that average profit 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. Thus the hypothesised relationship that there is positive and significant relation between average loan size and average profit is accepted at 5 percent confidence level. The result is consistent with the findings of Mersland and Strom (2010) and Freixas and Rochet (2008). This result shows that an MFI is able to earn higher profit when loan size is larger. This is actually the Yunus's worry that big loan size creates more profit and this thing crowds out the poorer clients from credit scheme [Christen and Drake (2002)].

Average cost has also positive and significant effect on average loan size. This explains that as average cost increases average loan size also increases and vice versa. Thus the hypothesised relationship that there is positive and significant relation between average cost and average loan size is accepted at 1 percent confidence level. This result is also confirmed by the finding of Mersland and Strom (2010) and Freixas and Rochet (2008) model. This is because loan size increases with increase in cost, MFI should increase its efficiency to minimise 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 Littlefield, *et al*. (2003) and Hishigsuren (2007). Subsidy uncertainty has positive but insignificant effect on average loan size. Thus loan size is not affected by the uncertainty in subsidy's time and amount. The insignificance of subsidy uncertainty seems striking at first site. It may because average profit is

rather weak indicator of mission drift [Dunford (2002)]. The result is also in line with the finding of Armendariz, *et al*. (2011).

Total assets of the MFI, used as proxy for size of the company, have positive and significant effect on average loan size. Thus, indicating that average loan size increases as size of the MFI increases. Thus the hypothesis that there is positive and significant relation between average loan size and size of MFI is accepted at 1 percent confidence level. This result is in line with the findings of Mersland and Strom (2010). Portfolio risk is negative and insignificant indicating that repayment risk has no effect on average loan size. Portfolio risk has no effect on the size of the loan in the study of Mersland and Strom (2010). The adjusted R^2 shows that 59 percent variations in the average loan size are explained by the variables included in the model.

In this model 2, number of active borrowers is proxy for mission drift and is used as dependent variable. Independent variables include average profit, average cost, subsidy uncertainty, size and portfolio risk. The results showed that average profit is negatively and significantly related with the total number of active borrowers. This means as profit increases the total number of active borrowers will decline. When the number of active borrowers is large, MFI has to bear larger transaction cost and when large size loans are given to fewer borrowers, transaction cost will be small, thus increasing the profit of the MFI. The result also confirms the argument of mission drift that increasing loan size reduces total number of active borrowers, less poor are served. The result is also in line with the results of above model where mission drift is captured by average loan size.

Average cost has negative and significant effect on total number of active borrowers. Thus as cost increases it reduces number of active borrowers. It indicates as cost of MFI increases, MFI tends to decrease total number of borrowers by giving larger loans to fewer clients. This is also in line with the Yunus's concern that increasing cost may reduce micro loans to the core poor clients. The results also confirm mission drift in the analysis saying that increasing cost puts a bad impact on the social mission of the MFIs. This result is also consistent with the result of model 1 where mission drift is captured by average loan size. Subsidy uncertainty has weak negative and significant effect on active number of borrowers. This result is also consistent with the findings of Armendariz, *et al*. (2011). This shows that when subsidy uncertainty increases MFIs go for larger loans to small number of borrowers to increase their profitability. The results of control variables MFI size and repayment risk is same as in model 1. The adjusted R-squared shows that 59 percent variations in the average loan size are explained by the variables included in the model.

6.2.2. *Real Interest Rate Regression Results*

The interest rate charged on the loans is the main source of revenue generation for microfinance institutions especially for those who do not offer

saving or deposit facility. There are many factors that affect interest rate charged on loans. Some factors are not in the institution's control such as levels of inflation, wealth of the country and political crises.

In interest rate regression, real interest rate is used as dependent variable and independent variables include subsidy uncertainty and operating cost. Total equity is used as proxy for size. Here study analyses that how subsidy uncertainty affects the real interest rate in an MFI. This model is estimated using simple OLS.

Table 6.3

Results of Interest Rate (Cost of Outreach) Model

Independent Variable	Real Interest Rate
Intercept	0.332 ***
	(7.8)
Subsidy Uncertainty	0.006 *
	(1.95)
Total Equity	–0.009***
	(–3.24)
Adjusted R- Squared	0.768

Note: *** Significant at 1 percent, ** Significant at 5 percent, and * Significant at 10 percent.

The results show that subsidy uncertainty has a positive and significant effect on interest rate of the MFI. This means that higher subsidy uncertainty is related with higher interest rate. This result confirms the hypothesised relationship that subsidy uncertainty is positively and significantly related with interest rate charged on loans. Further it is also consistent with the findings of Armendariz, *et al*. (2011).

The results show that the size of the MFI is negatively related with the interest rate. This confirms that as size of MFI increases, it reduces the interest rate charged on the loans. As the size of the MFIs increases it becomes more sustainable. That is why interest rate is inversely related with the size of MFI. This result is also consistent with the findings of Armendariz, *et al*. (2011). Zacharias (2008) finds in his study that operational efficiencies and size are positively correlated. Larger MFI appears to be more efficient that small size MFI and this study finding is also in line with this. As size of MFI increases, it becomes more efficient; which means it operates on reduced cost and ultimately offers loan on low interest rate. When cost increases, MFI increases interest rate charged on loan to remain sustainable. When transaction costs increase due to large number of small loans, MFI will charge high interest rate for financial services [Hudon and Traca (2008); Crabb (2007)].

6.2.3. *Result of Simultaneous Regression Model*

Simultaneous equation models are also employed to further validate these results. The result of first system for robustness check is following:

Table 6.4

Results of System of Equations of Average Loan Size and Average Profit

Independent Variable	Average Loan Size	Average Profit
Intercept	1.66 ***	–1.55 ***
	(6.08)	(–3.21)
Average Profit	0.486 ***	
	(27.19)	
Average Cost	0.301 ***	
	(12.09)	
Average Loan Size		1.25 ***
		(33.38)
MFI AGE	–0.003	–0.288 ***
	(–0.049)	(–2.47)
MFI SIZE	0.097 ***	–0.119 ***
	(6.05)	(–4.24)
Portfolio Risk > 30 Days	0.135	–0.47 *
	(0.808)	(–1.66)
Subsidy Uncertainty	0.040 **	–0.07 **
	(2.14)	(–2.29)
Adjusted R-Squared	0.661	0.545

Note: Estimation Method used is Seemingly Unrelated Regression. *** Significant at 1 percent, **at 5 percent and * at 10 percent.

In this system, average profit, average cost and size of MFI are positive and significantly affecting the average loan size. As they increase, the size of loan also increases. Thus it verifies our results in the above models where GMM estimation technique is used. It is proved that they play an important role in defining the size of the loan used as proxy for mission drift. They are important determinants of mission of MFIs. Portfolio at risk (more than 30 days) variable is insignificant as it is insignificant in the above model results. Thus it further verifies our result. It has no effect on the mission of MFI. The subsidy uncertainty has a positive and significant effect on the average loan size. This implies that if subsidy uncertainty increases, the size of loan also increases. Uncertainty creates risk of sustainability and financial distress. To cover these risks in the environment where the timing and amount of subsidy is uncertain, MFIs increase loan size in order to earn more profit. The increased loan size kicks out the core poor clients from the network of basic financial services, although providing financial services to the very poor clients is the main

objective of any microfinance institute. Thus subsidy uncertainty leads towards drifts from the social mission.

The average loan size is used as independent variable in second structural equation, having positive and significant coefficient. This confirms the positive relationship between average loan and profit. This result shows that when loan size increases, the profit also increases confirming that increasing loan size leads towards higher profit which ultimately accounts for mission drift. Average profit is simultaneously affected by the loan size and loan size is simultaneously affected by the average profit. This is proved in our results.

Table 6.5

Results of System of Equations of Average Loan Size and Average Cost

Independent Variable	Average Loan Size	Average Cost
Intercept	1.542 ***	–0.597*
	(5.77)	(–1.81)
Average Profit	0.179 ***	0.875 ***
	(9.57)	(32.40)
Average Cost	0.719 ***	
	(27.66)	
MFI AGE	–0.063	–0.133 *
	(–0.932)	(–1.66)
MFI SIZE	0.075***	–0.023
	(4.77)	(0.232)
Portfolio Risk > 30 Days	–0.120	–0.041 *
	(–0.726)	(–1.77)
Subsidy Uncertainty	0.340 *	0.258
	(1.82)	(1.22)
Adjusted R-Squared	0.687	0.52

Note: Estimation Method used is Seemingly Unrelated Regression. ***Significant at 1 percent, ** at 5 percent and * at 10 percent.

In this system, average profit, average cost and MFI size have positive and significant effect on average loan size. These all are significant at 1 percent confidence level. This also confirms our finding in the previous models that profit, cost and size matters in mission fulfilment. Average loan size increases with increase in any of this one. In this model, average loan size is run simultaneously with average cost. Both coefficients of average cost first structural equation and average loan size in second structural equation are significant and positive. This proves that these variables are affecting each other simultaneously. Thus it is proved that in checking mission drift these variables play an important role and an increase in these variables leads towards increased average loan size. Portfolio at risk has no effect on the mission of the

microfinance institutions. This variable is also insignificant in all previous models. Thus it is confirmed that it has no effect on the average loan size of MFI.

The results indicate that subsidy uncertainty has also significant as in the above system. It directly affects the average loan size. This variable is significant at 10 percent confidence level. Subsidy uncertainty is coming significant in simultaneous models. It shows that this variable is important and affecting the average loan size. It is proved one more time that subsidy uncertainty is affecting the mission of MFIs.

7. CONCLUSIONS AND IMPLICATIONS

Microfinance is seen as poverty alleviation tool since from its start. Microfinance has dual mission of providing cheapest financial services to the core poor people, which are neglected by the formal financial sector and secondly to remain financial sustainable. Recently, a debate is started that most of the MFIs are only fulfilling their secondary objective.

The study is conducted with the objective of finding reasons and evidence of mission drift in microfinance industry in Asia and also to check which variable is more closely linked with mission drift. To check the argument of mission drift the study use average loan size and total number of active borrowers as proxy variables for mission drift. Other main variables include subsidy uncertainty, average profit, average cost, interest rate and portfolio risk. The present study examines the relationship of average loan size with average profit, average cost, risk, MFIs' size and subsidy uncertainty using panel data estimation techniques.

The study finds that profit and cost of MFIs are directly related with the loan size. The increased loan size increases the profit as well as operating cost of the MFIs. In this way the increased profit is offset by the increased cost. Therefore, increase in profit leads to increase in costs. This finding is consistent with the findings of Mersland and Strom (2010), Frhyne (1998) and Christen and Drake (2002). Portfolio risk is insignificant in all models indicating that it has no effect on the mission of MFI.

This study finds that subsidy uncertainty is directly related with the interest rate. As subsidy uncertainty increases, interest rate on lending also goes upward. This result is consistent with the findings of Armendariz, *et al*. (2011). This confirms that when MFIs face subsidy uncertainty, they tend to give loans on higher interest rate in order to remain sustainable, in the conditions where subsidies may dry up. The relationship between the average loan size and subsidy uncertainty is positive and significant. The study also finds that subsidy uncertainty is associated with lower number of active borrowers. This result is consistent with the findings of Armendariz and Szafarz (2011). These results show that subsidy uncertainty is the important factor that is reason of mission drift.

On the basis of these findings, all three hypotheses are accepted. It is therefore, concluded that the study finds evidence of mission drift. Subsidy uncertainty is the main factor that causes mission drift as evidenced by average loan and interest rate results both goes upward. Although the effect of increasing profit is offset by the increasing cost but increasing profit is signal of mission drift, because loan size is increased with it. Increasing cost increases operational sustainability risk which ultimately leads towards less concentration on the core mission of poverty alleviation.

The implications that emerged from findings that management of microfinance institutions should focus on the cost of operations. Cost efficiency is very important in giving small loans to maximum number of poorer borrowers. As cost efficiency increases, loan size becomes small, which ultimately fulfil the promise of maximum outreach to the core poor clients. Therefore, all stake holders of microfinance should focus on the cost efficiencies; how to reduce cost per borrower. MFIs need to start deposit facility, in order to cover their costs and less dependence on donor's subsidy. For subsidy donors and Government the findings suggest that they need to make more clear policies regarding the disbursement timing and amount of subsidy. This will reduce the ambiguity about subsidy in MFIs and let them work more confidently on their missions.

APPENDIX

Correlation in Variables

Table A1

Correlation between Variables

	Average Profit	Average Cost	MFI SIZE	Risk > 30 Days	Real Interest Rate
Average Profit	1.000				
Average Cost	0.703	1.000			
MFI SIZE	0.098	0.157	1.000		
Risk > 30 Days	-0.053	0.007	0.029	1.000	
Real Interest Rate	0.165	0.249	-0.221	-0.022	1.000

Table A2

Panel Least Squares

Independent Variables	Dependent Variable Average Loan SIZE
C	2.28 ***
	(11.24)
Average Profit	0.65 ***
	(13.92)
MFI Size	0.107 ***
	(8.613)
Portfolio Risk >30 DAYS	0.135
	(1.17)
RES01	**-0.137 *** **
	(-2.82)
Adjusted R- Squared	0.618

Note: *** significant at 1 percent, ** significant at 5 percent, and * significant at 10 percent.

Table A3

Panel Least Squares

Independent Variables	Dependent Variable Average Loan Size
C	1.35 ***
	(6.38)
Average Cost	0.990***
	(13.09)
MFI SIZE	0.049***
	(3.58)
Portfolio Risk >30 Days	-0.241**
	(-2.4)
RES02	**-0.277*** **
	(-3.60)
Adjusted R- Squared	0.648

Note: *** significant at 1 percent, ** significant at 5 percent and * significant at 10 percent.

Table A4

Result of Hausman Test for Model 1

Correlated Random Effect- Hausman Test	Test Cross Section Random Effect (R1)		
Test Summary	Chi- Sq. statistics	Chi- Sq. d.f.	Prob.
Cross Section Random	154.877497	5	0.0000

Table A5

Result of Hausman Test for Model 2

Correlated Random Effect- Hausman Test	Test Cross Section Random Effect (R2)		
Test Summary	Chi- Sq. statistics	Chi- Sq. d.f.	Prob.
Cross Section Random	122.703786	5	0.0000

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