Religiosity and threshold effect in social and financial performance of microfinance institutions: System GMM and non-linear threshold approaches

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Abstract

The commercialization process and over-emphasis on sustainability apparently improve Micro finance institutions' financial performance and the scale in terms of total number of borrowers and average loan size. Whether focusing on financial sustainability is necessarily at the sacrifice of serving the less poor clients or social and financial performance of MFIs, depends on the social values and religion. The inconsistent results of previous studies implicate that linear regressions may be insufficient to explain the sustainability-outreach linkage because of potential non-linear relationship between financial sustainability and average loan size. To solve the puzzle, this study employs relatively advanced dynamic difference and system GMM as well as non-linear Hansen threshold techniques. To the best of our knowledge this is the first study to apply non-linear technique over a sample of conventional and Islamic MFIs at the same time. The results tend to indicate the existence of religiosity effect on the social and financial performance of microfinance institutions, while the study does not find any evidence of sustainability-outreach paradox. Our findings present important insights for Islamic and conventional microfinance managers and donors as well as policy makers of the country to formulate a better policy. Social performance will harmonize the financial performance of microfinance institutions, so the MFIs authorities should not be necessarily worried about the financial sustainability while focusing on outreaching the poor.

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Introduction

The microfinance industry is vibrant. Diversity of ownership in the industry is substantial. Member-based cooperatives, foundations, government banks, private persons, shareholder entities, listed commercial banks, and even multibillion dollar international banks constitute a colorful and rapidly growing industry. The objectives of such organizations range from female empowerment to high profit. Among these organizations, several religion-based actors are involved, including Hindu, Islamic, and especially Christian organizations (Harper et al., 2008). The relatively new practice of Islamic micro-finance institutions has an outreach of only 1 million Muslims compared to 650 million Muslims who are living below the average poverty line of developing countries. The very low outreach is due to Islamic micro-finance is a new phenomenon, and still is in the state of its infancy. The key is for the IMFIs to build capacity and capability to provide a diversified array of Shari`ah compliant Islamic micro-finance products to the Muslims in dire need of Islamic microfinancing.

Although many Western policy elites hold a secular world-view and equate modernization and secularization (Thomas, 2005), many aid and development organizations are based on religious principles and are managed by people who are inspired by religious beliefs. More important, in a purely conventional model, the basic values of large groups of poor people are ignored. Increasingly, several parties in the development arena seem to share this concern. A few years ago, the United Kingdom government initiated a project known as Faith in Development, a multimillion-pound research consortium. Similarly, the Dutch Ministry of Foreign affairs instituted the Knowledge Forum on Religion and Development Policy, and the Norwegian government recently launched a dialog initiative about religion and aid. The World Bank has delivered several reports on religion and development issues (e.g., Marshall & Keough, 2004). Clearly, there is no lack of policy interest concerning religion and development; however, empirical research regarding the influence of religion on development is fragmented and still in its infancy.

The microfinance field has become a place of confrontation between different theoretical and empirical approaches. Microfinance would enable a group of people with widely different

characteristics and / or unbanked out of the stranglehold of moneylenders, therefore including them financially and socially. The underlying assumption considers that the seniority in access to microfinance services can improve living conditions and reduce poverty among beneficiaries. (Koloma Y., 2010)

However, many studies recently arisen a very important question whether an MFI's poverty targeting measured by the percentage of the poorest clients affects financial sustainability of MFIS's financial sustainability and how the relationship between social and financial performance changes after controlling the poverty level.

Many existing studies have tried to explain the sustainability-outreach relationship by investigating different conditions under which it may be affected, such as regulation (Cull et al., 2009b; Cull et al., 2009b; Mersland and Strøm, 2009), regional distribution (Awaworyi and Marr, 2014), competition (Kai, 2009; McIntosh and Wydick, 2005; Cull et al., 2009), financing (Borgan, 2009; Kyereboah-Coleman, 2007), and so forth. Conclusions are inconsistent-some suggest a trade-off relationship, some show a complementary linkage, while others indicate a mixed or no significant association between the two. There are several reasons for the controversial results: 1) the vast diversity among MFIs operating under the definition of "microfinance". "Microfinance institutions" is an umbrella term that contains many different types (Philippe, 2013); 2) sample selection biases. Except for case studies on individual/selected MFIs, the most popular public database for constructing a sample is the one developed by the MIX Market but it is questioned to have some biases in the data (Bauchet and Morduch, 2010); and 3) the potential non-linear relationship between financial sustainability and average loan size. The inconsistent results implicate that linear regressions may be insufficient to explain the sustainability-outreach linkage. A better choice over sample data may enable us to further explore the changes in the size of tradeoff or the changes from trade-off to synthase or vice versa. (Li,Y., 2015)

This paper tries to investigate both religiosity and threshold effects on the relationship between social and financial performance of Microfinance Institutions. Poverty targeting puts threshold effects on an MFI's financial sustainability and based on it, both the positive and the negative links between financial sustainability and average loan size are observed. To achieve financial viability, high poverty targeting MFIs provide relatively smaller loans to a larger number of borrowers while low poverty targeting MFIs serve a smaller scale of clients by larger loans. Besides, different poverty targeting strategies also reflect the different

operating mechanisms in terms of interest rate, cost, risk, and capital structure. Moreover, there is even less in the area of Islamic microfinance and development. Thus far, the existence and effect of religious actors in modern microfinance has not been addressed by rigorous research. From our angle, it is specifically examining Islamic based approach to development through micro financing schemes and social and financial economic performance both in Islamic and conventional sectors.

The rest of the paper is structured as follows: Section two presents an overview of existing literature on the relationship between religion, development, financial sustainability, social outreach, and serving the poorest. Section three describes the data, variables and methodology used in the study. Section four presents the main empirical results and robustness checks. Conclusions are made in the final section.

Theoretical Underpinning

The term micro-finance can be described as the provision of financial service to low income clients, including self employed, low income entrepreneurs in both urban and rural areas. The micro-finance revolution which begun with independent initiatives in Latin America and South Asia starting in the 1970s, has so far allowed 65 million poor[4] people around the world to receive small loans without collateral, build up assets, and buy insurance. The idea of micro-finance programs has come from Muhammad Yunus who began a micro-finance program among women in Bangladesh in 1976 through the University of Chittagong; however the concept is relatively simple and enjoys a long tradition in many developing countries. The basic idea of micro-finance is to provide credit to working poor who otherwise would not have access to credit services. This service has been provided in variety in different countries by moneylenders in poor communities for a long time.

In the economic history literature, there is a long-standing debate regarding the role of religion in stimulating economic growth. This debate began with Max Weber's classic work The Protestant Ethic and the Spirit of Capitalism (1930/ 1958). Weber claimed that the Protestant ethic, which focuses on personal agency and diligence, spurred economic development. Although Weber's thesis has been disputed, the more general idea that certain

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[4] The broadly defined "poor people" by the World Bank are the population living under $1 or $2 per day per capita. The "poorest of the poor" in the microfinance industry, according to the latest Microcredit Summit Campaign Report (2013), refers to any of the 1.4 billion living on less than $1.25 per day adjusted for purchasing power parity, or families whose income is in the bottom 50 percent of all those living below their country's poverty line.

religious (Christian) attitudes may have positive economic implications continues to be discussed and supported (e.g., Iannaccone, 1998). The extensive debate regarding the historical role of religion in the development of modern capitalism sharply contrasts with the meager attention that has been devoted to religion in current development efforts and research.

Theories of religion and MFIs development factors

Different theories have discussed the role of religion on the development factor of microfinance institutions. The Neo-classical growth model emphasizes the importance of savings in order for a country's economy to grow. According to Todaro et al. (2003), one of the main constraints for poor households in developing countries is the lack of access to financial services. This is a consequence of poorly developed financial markets and commercial banks tending to offer its service almost exclusively to medium and large companies that are thought to be credit worthy. In view of neo-classical growth theories, it implies that the accumulation of capital is hampered and the growth of the country's economy is restrained. The Welfarist theory focuses on reducing poverty through credit, often provided together with complementary services such as skills training and teaching of literacy and numeracy, health, nutrition and family planning. Robinson (2001) points out that under this approach, credit is provided to poor borrowers, typically at below market interest rates. The goal is to reach the extremely poor with credit to help them overcome poverty and also gain empowerment. The performance of the MFI"s are measured through household studies with focus on the living standard of the individuals; number of saving accounts, number of loans, productivity improvement, incomes, capital accumulation, social services such as education and health as well as food expenditures(Congo,2002).

Another theory connected to microfinance is the uniting theory of microfinance. This theory advocates for joint liability in the repayment of microfinance loans. The argument fronted by this theory is that joint liability could improve repayment rates and the welfare of credit-constrained borrowers. In joint liability, when one borrower cannot repay a loan, group members are contractually require to pay instead. Second, the perception of joint liability can be implicit. Borrowers believe that if a group member defaults, the whole group will become ineligible for future loans even if the lending contract does not specify this punishment.5

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[5]Ghatak and Gunnane (1999)

The empowerment theory shows how microfinance loans can empower people to improve their standard of livings by enabling them to start businesses. The theory points out that women account for nearly74 percent of the 19.3 million of the world's poorest people now being served by microfinance institutions. Most of these women have access to credit to invest in businesses that they own and operate themselves. The vast majority of them have excellent repayment records, in spite of the daily hardships they face. Contrary to conventional wisdom, they have shown that it is a very good idea to lend to the poor and to women.6

Religiosity effect on Islamic MFIS

In sum, the forces that typically cause organizations in a field to become similar are still not very strong in the international microfinance industry. In addition, Islamic and conventional MFIs are partly influenced by different isomorphic factors because they normally have different owners, often have different donors or funders, and depend on public funding to different degrees (secular MFIs typically are more dependent on public funding). Therefore, we expect substantial differences in the practices and potentially in the performances of Islamic and conventional MFIs.

There are reasons to expect Islamic development organizations to differ from their conventional counterparts. According to institutional theory, three major forces cause organizations in a field to be more isomorphic, or similar (DiMaggio & Pow-ell, 1983). First, important actors, on whom organizations depend, such as governments or other parties with resources, may impose regulations or policies that lead to isomorphism. However, the microfinance industry is weakly regulated or unregulated in most countries. Second, organizations may mimic popular practices in other organizations, particularly in uncertain conditions. However, for now, we still believe that there is considerable freedom for each MFI to define its policies and practices according to its own ideology and objectives.

In an interest free model of micro-finance in Islamic finance, it is suggested that four key principles must strictly be followed, such as 1) belief in divine guidance, 2) no dealings with riba or interest based transactions, 3) no dealings with other Shari`ah non-compliant transactions, 3) preferably dealings with risk sharing financial products and instruments, and

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6Cheston and Kuhn (2002)

4) financing based on involving in real assets (Abdullah & Chee, 2012). It is also suggested that the act of lending is to be treated more of as a moral phenomenon than a purely economic activity (Zaman, 1991). Borrowing is not prohibited in Islam though the Prophet (pbuh) discouraged taking loans unnecessarily. In this respect, the confluence of Islamic finance and micro-finance will solve the problem of income disparity, because the elements of riba or interest must be avoided in Islamic financial instruments and will refocus the MFI to its social course.

The relatively new practice of Islamic micro-finance institutions has an outreach of only 1 million Muslims compared to 650 million Muslims who are living below the average poverty line of developing countries. The very low outreach is due to Islamic micro-finance is a new phenomenon, and still is in the state of its infancy. The key is for the IMFIs to build capacity and capability to provide a diversified array of Shari`ah compliant Islamic micro-finance products to the Muslims in dire need of Islamic microfinancing.

The IMFIs provide intermediary financial services by accepting funds from investors and other stakeholders on one hand, and disburse the funds with or without profits to poor micro-entrepreneurs and households on the other hand, via an Islamic financial instrument The basic model consists of five essential components which are needed to complete a full cycle of Islamic microfinancing process, namely funding, an Islamic micro-finance institution, an Islamic financial instrument for disbursement of fund, the borrower, and the repayment.

Social-financial performance Paradox

It is argued that despite the phenomenal success of many both conventional and Islamic MFIs to alleviate poverty around the globe, the high interest rate on the microloan has increased the disparity between the rich and the poor sectors of the economy (Tahir, 2012). With more and more MFIs operating like commercial entities with the aim of maximizing profit and creating values for their shareholders, their social goal of alleviating poverty and fair distribution of income has suddenly become unattainable.

With a strong social mission of outreaching to the poor and the poorest, MFIs have been receiving tremendous support from donor agencies, private investors and government authorities. On the one hand, the proven ability to be profitable of non-profit MFIs has brought for-profit institutions to the microfinance market, leading to increased competition in the sector (McIntosh and Wydick, 2005). On the other hand, donors and policy makers

questioned the role of continuous subsidies and encourage the independence of MFIs from subsidies and become self-sustainability. From the first transformed NGO MFI (PRODEM, later BancoSol) in Bolivia to the IPO of Banco Compatamos in Mexico and SKS in India, growth and sustainability seem to be the main rhythm. The commercialization process and over-emphasis on sustainability apparently improve MFIs'financial performance and the scale in terms of total number of borrowers, yet concerns about mission drift also come along with this trend (Christen 2001;Drake and Rhyne, 2002; Copestake, 2007; Armendaritz and Szafarz, 2009; Mersland, 2010).That is, some MFIs in pursuit of better financial performance might have shifted away to serve the marginal poor or non-poor clients with larger loans instead of the original poor and the poorest who require smaller loans.

From the theoretical perspective we do not get any unified solution of the puzzle of social-financial performance paradox. Theoretically there's a immense need to reexamine the Religiosity effect on religion development relationship through Islamic microfinance institutions.

Empirical Literature

Despite repeated claims that religions and religious beliefs represent an important yet neglected factor in development (e.g., Marshall & Keough, 2004; Ter Haar & Ellis, 2006; Thomas, 2005), empirical studies on the effects of religion on development efforts are scarce. Religion may influence the perceptions and behaviors of several parties in the develop-ment arena. Regarding the recipients of development efforts, Ter Haar and Ellis (2006) claim that religious beliefs provide moral guidance and encourage people to improve their lives. Religion may also influence providers of development efforts. For example, many international development organizations, such as Muslim Aid and Islamic Development Bank, are Islamic organizations. The microfinance industry is no exception. Several Islamic organizations are actively involved in advancing the microfinance industry. In this paper, we use microfinance institutions (MFIs) as examples of providers of development efforts and determine the differences between Christian and secular MFIs in various dimensions of organizational performance.

Thus far, the existence and effect of religious actors in modern microfinance has not been addressed by rigorous research. Bussau and Mask (2003) outline the theological reasons why Christian actors should care about microfinance and entrepreneurship, and Harper et al.

(2008) relate the stories of three religious MFIs: one Muslim, one Christian, and one Hindu. To the best of our knowledge, other, more academic sources are not available.

The relationship between religion and development has been covered extensively through the years. Poverty prevalence dates back to the existence of human beings. It has occupied foremost place on human development agendas of virtually all countries of the world including during the time of Islamic civilization where the implementation of Islamic-based economic principles was expected to lead to poverty alleviation.[7]

Although many Western policy elites hold a secular world-view and equate modernization and secularization [8] many aid and development organizations are based on religious principles and are managed by people who are inspired by religious beliefs. More important, in a purely secular model, the basic values of large groups of poor people are ignored. Increasingly, several parties in the development arena seem to share this concern. A few years ago, the United Kingdom government initiated a project known as Faith in Development, a multimillion-pound research consortium. Similarly, the Dutch Ministry of Foreign Affairs instituted the Knowledge Forum on Religion and Development Policy, and the Norwegian government recently launched a dialog initiative about religion and aid. The World Bank has delivered several reports on religion and development issues (e.g., Marshall &Keough, 2004). Clearly, there is no lack of policy interest concerning religion and development; however, empirical research regarding the influence of religion on development is fragmented and still in its infancy.

The microfinance revolution, begun with independent initiatives in Latin America and South Asia starting in the 1970s, has so far allowed 65 million poor people around the world to receive small loans without collateral, build up assets, and buy insurance. Idea of microfinance programs has come from Dr. Yunus who began a microfinance program among women in Bangladesh in 1976 through the University of Chittagong; however the concept is relatively simple and enjoys a long tradition in many developing countries. The basic idea of micro-finance is to provide credit to working poor who otherwise would not have access to credit services. This service has been provided in variety in different countries by moneylenders in poor communities for a long time.[9]

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[7]Abdelhaq(2011)
[8]Thomas(2005)
[9] Zeller & Meyer(2002)

The application of Islamic finance to microfinance was discussed in depth by Rahul and Sapcanin (1998). They demonstrate that Islamic banking, with its emphasis on risk sharing and, for certain products and collateral-free loans, is compatible with the needs of some micro-entrepreneurs. Viable projects that are rejected by conventional lending institutions because of insufficient collateral might prove to be acceptable to Islamic banks on a profit-sharing basis However, they concluded that from a microfinance standpoint the mudaraba model (profit-sharing) has more drawbacks than the murabaha model (cost plus markup). The murabaha model is overall more cost effective, has a lower margin of error, and provides immediate collateral for a MFI because the MFI owns the goods until the last installment is paid. Dusuki (2006) has presented the idea of Islamic microfinance initiative in the perspective of Ibn Khaldun's concept of 'Asabiyah or social Solidarity that emphasizes group efforts and loyalty over self-interests of individuals. He argues that Islamic microfinance can be promoted through group lending to the poor who are normally denied access to mainstream banking services.

Literature on sustainability-Outreach Paradox

Explaining the sustainability-outreach relationship by investigating different conditions under which it may be affected, such as regulation (Cull et al., 2009b; Cull et al., 2009b; Mersland and Strøm, 2009), regional distribution (Awaworyi and Marr, 2014), competition (Kai, 2009; McIntosh and Wydick, 2005; Cull et al., 2009), financing (Borgan, 2009; Kyereboah-Coleman, 2007), and so forth. Conclusions are inconsistent-some suggest a trade-off relationship, some show a complementary linkage, while others indicate a mixed or no significant association between the two.

Armendariz and Morduch (2010: 5-8) argued that poorer enterprises should be able to pay banks higher interest rates than richer enterprises. They also have the perception that money should flow from rich depositors to poor entrepreneurs. The money did not flow easily to the poor countries as predicted due to high credit risk resulting from lack of collaterals, high transaction costs, and weak legal enforcement mechanisms. One thing is right about the principle though is that the borrowers are forced to pay higher interest rate charged by the banks. In the case of Banco Compartamos, the largest Latin America micro-finance institution based in Mexico had charged its customers an average interest rate of roughly 100% per annum while the yearly inflation rate in Mexico was around 4%. The extraordinary high returns had attracted more profit oriented capital when some MFIs like Bank Rakyat

Indonesia, Kenya's Equity Bank and Banco Comparators went public in 2003, 2006 and 2007 respectively for the shareholders to realised the value of their investment, although at the same time, the funding from the listing had allowed the banks to expand their outreach dramatically to more customers (Armendariz & Morduch, 2010: 239-241).

Since giving and taking interest is categorically prohibited in IslamIMFIs cannot adopt the above mentioned profit-oriented model using interest.. Instead, it should emerge as a donor funded institution with clear mission of eradicating poverty and fulfilling just and equitable socio-economic development. The funding for IMFIs will be derived mainly from donations in the form of cash waqf, sadaqah, zakah, hibah and tabarru`, equity capital and the government's subsidies to partially finance the high transaction costs. In deciding on the type of funding, the IMFIs have to consider the costs, benefits, and nature of each fund.

Due to the opposite nature of an MFI's financial and social goals, it is difficult to find the best balance point at which trade-offs can be greatly minimized and financial performance can be maximized by providing small loans to poor and the poorest clients. Due to this reason, many early studies support the trade-off theory. For example, Conning (1999), who studies the linkage between outreach, sustainability and financial leverage for a dataset of 72 MFIs, points out that sustainable MFIs targeting poorer borrowers should charge higher interest rates, undertake higher costs per loan and be less leveraged. Navajas et al. (2000) analyzes five Bolivian MFIs with high financial sustainability among peers and find that they are not targeting the poorest but rather those near the poverty line as the poorest are less likely to be creditworthy and to demand loans. Olivares-Polanco (2005) investigates the determinants of outreach in terms of loan size using data for 28 MFIs in Latin America for the years 1999-2001. Using Ordinary Least Square, he also confirms the trade-off between sustainability and outreach though he doesn't specify the client poverty level.

However, if affordability is a major issue concerning serving the poor and the poorest and being financially viable, then these two goals are compatible if MFIs can meet clients' specific needs through innovative methods to develop suitable products and services. Gibbons and Meehan (1999) demonstrates three MFIs from Asia, Latin America and Africa respectively and argues that financial sustainability actually can be achieved by serving substantial number of the poorest clients. "Progressive" lending to this clientele, along with efficiency and other initiatives at the program level, enables the compatibility of these two goals. The paper also summaries some best practices on how to achieve it. Other supporters

of the complementary view are Christen et al. (1995), Woller et al. (1999), Churchill (2000), Woller and Schreiner (2002), and so forth.

Fernando (2004) summarizes three camps of hypothesizes on the issue of providing financial services to the poorest and its effects on financial sustainability. The first camp holds the opinion that the poorest can't be reached on a sustainable basis due to the ineffective demand for financial services among the poorest, the high service delivery costs for MFIs, and the unaffordable prices charged by MFIs to the poorest. The second camp argues that the poorest can be reached on a sustainable and large-scale basis. If funding agencies provide more funds to these MFIs, outreach to the poorest can be rapidly increased. The third camp considers the potential for reaching the poorest on a sustainable but limited scale basis. Innovation in service delivery mechanisms is a must and subsidies play an important role in reaching the poorest in a sustainable way. Cull et al. (2007) are among the first to conduct a comprehensive empirical study using a global dataset of 124 MFIs in 49 countries. He divides the total sample based on different lending types and find mixed results. Individual-based lenders perform better in terms of profitability but it is achieved through focusing less on very poor and women borrowers, indicating the existence of a trade-off. Meanwhile, the study also finds examples of institutions that have realized both profitability and outreach to the poor. As stated in their study, institutions making smaller loans are not necessarily less profitable when other relevant factors are included. However, the study doesn't specifically focus on the poorest clients. Quayes (2012), based on MFIs' disclosure level, divided the sample of 702 MFIs from 83 countries into two groups. The full sample shows that financial sustainability has no impact on the depth of outreach proxied by average loan size/GNI per capita. Though trade-off exists in low-disclosure MFIs, financial sustainability has a positive impact on the depth of outreach for the high disclosure MFIs. The results hold after considering the simultaneity issue by applying a three-stage least squares model. Not-for-profit MFIs have better outreach but poorer financial performance in comparison to for-profit MFIs. Again, this study doesn't provide further information on client poverty level.

Gonzales and Rosenberg (2006) study the relationship between outreach, profitability and poverty using data reported to Microcredit Summit Campaign (MSC) and the MIX Market platform respectively. In the MIX Market data, the correlation between average loan size and profitability (measured by return on assets) is very weak and the slop of the curve is low. Using the percentage of the poorest clients and operational self-sufficiency from the MSC dataset, they find that the correlation between these variables and the slope for the

relationship are still very weak and low. They conclude that there may be relatively little conflict between improving sustainability and reaching poorer clients and it can find individual MFIs who are strongly profitable while serving the very poor clients.

It is hard to draw a consistent conclusion on this issue as the microfinance sector is still evolving. Besides, more diversified institutions with mixed clientele join the sector, making it harder to conclude. Recent empirical studies start to divide the total sample dataset into subsamples based on certain features that may affect the sustainability-outreach relationship.

Methodology we used

To examine the effect of religion this study employs System GMM on a panel dataset of 90 conventional and Islamic MFIS and secondly, to test the threshold effect of social –financial performance paradox this study employs non linear Hansen threshold regression model.

Generalized method of moments (GMM)

Dynamic panel data regressions are characterized by two sources of persistence over time, namely, autocorrelation due to the presence of a lagged dependent variable among the regressors and individual effects characterizing the heterogeneity among the individuals. The endogeneity problem associated with dynamic models is dealt with in this paper using the generalized method of moments (GMM) procedure proposed by Arellano and Bond (1991) which is more efficient than the instrumental variable (IV) estimation procedure suggested by Anderson and Hsiao (1981). Arellano and Bond (1991) demonstrate additional instruments can be obtained in a dynamic panel data model if one utilizes the orthogonality conditions that exist between lagged values of the dependent variable and the disturbances. Using these moment conditions, Arellano and Bond (1991) propose a two-step difference GMM estimator.

Blundell and Bond (1998) demonstrate however that the instruments used in the difference GMM estimator become less informative in two important cases. Firstly, as the autoregressive parameter increases toward unity; and second as the variance of the parameter effect increases relative to the variance of the transitory shocks. Arellano and Bover (1995) and Blundell and Bond (1998) propose that an additional mild stationarity restriction on the initial conditions process allows for the use of an extended system GMM estimator. The

system GMM estimation is found to be more appropriate in the presence of variables that are close to a random walk (Bond, 2002; Roodman, 2009). The difference GMM estimation under these conditions is found to suffer from a weak instrument problem (Sarafidis et. al, 2009). The difference GMM approach also magnifies gaps in unbalanced panels (Roodman, 2009). This motivates the use of forward orthogonal deviation transformations.

In view of the above, we run both the two-step difference and system GMM estimations for our panel data set (see tables in the Appendix). We follow up with post estimation specification tests, namely the Sargan (1975) test for over-identifying restrictions and the Arellano-Bond (1991) test for no autocorrelation in the first-differenced errors. We base our decision to proceed with the difference GMM estimation in spite of the above limitations, given the relatively low level of persistence in the time series dimension of capital buffers (average of around 0.34). High persistence in the series is a necessary condition for expectations of asymptotic efficiency gains using the system GMM10(Blundell and Bond, 1998; Roodman, 2009). The application of difference GMM is also warranted given the estimated coefficient of the lagged dependent variable for the system estimator does not increase significantly on average relative to the two-step differenced estimator.

Non linear hansen threshold

Threshold regression models or sample splitting models have wide application in economics and applied econometric practice (Hansen 1999; Hansen 2000).It allows to endogenously determine the threshold level(s) at which the sample is split. It treats the threshold value(s) as unknown instead of arbitrarily deciding the splitting point.

One important issue that most models have to concern is the endogeneity problem which occurs when an explanatory variable correlates with the error term due to omitted variables, measurement errors, or simultaneity (Wooldridge, 2006). Existing literature regarding sustainability and outreach address this issue differently. For example, Cull et al. (2009) don't point out the endogeneity in the model. Quayes (2012) uses a three stage least square to cope with the simultaneity issue but doesn't further address the endogeneity problem. In this sustainability regression model, I consider the potential existence of endogeneity between financial sustainability and outreach (both breadth and depth).Ordinary Least Square (OLS) may lose its efficiency in estimating the coefficients. A common practice is to introduce instrumental variables (IVs) and to estimate the equation by the Generalized Method of Moments (GMM).

Outreach is endogenous and is correlated with the error term. The asymptotic distribution of this test statistic is non-standard as the parameter is not identified under the null hypothesis. Hansen (1996) and Caner and Hansen (2004) suggest a bootstrapping procedure to obtain the asymptotic P-value. Collect the estimated residual under the unrestricted model for each and then use this pseudo-dependent variable to replace to repeat the calculation above. The resulting SupW* statistic has the same asymptotic distribution as SupW.By repeating the simulation draws, the asymptotic p-value of the test statistic SupW can be calculated with arbitrary accuracy.

This paper tries to investigate the threshold effects on the relationship between financial sustainability and social outreach. Operational self-sufficiency (OSS) is used as dependent variable to measure an MFI's ability to cover costs through operating revenues without adjustment from donations and subsidies. Average loan size adjusted by GNI per capita, a proxy for depth of outreach, is included in order to make the results comparable to the existing literature. As mentioned earlier, it is a rough indicator of client poverty level. So the inclusion of the percentage of the poorest as a sample splitting point is expected to add more explanatory power to the sustainability-outreach relationship. Total active borrowers, a measurement for breadth of outreach, is included to observe its relationship with sustainability and depth of outreach. Besides, some other independent variables that are closed related to an MFI's operation and are controllable at the institutional level are adopted, including an MFI's cost, profit, risk, capital structure, size and age.

Regarding social outreach, Gutiérrez-Nieto et al. (2009) view that financially efficient MFIs are also socially efficient in reaching the poor. This is not supported by Herms et al. (2011) who argue that improving efficiency may only be achieved if MFIs focus less on the poor. Serving the individual poorest may be more costly, but it is also possible for MFIs to benefit from the joint efficiency by serving the majority or exclusively the same segment.

Variables

 (a) Social performance

Although most microfinance actors agree that both financial and social objectives are important, there is no consensus as to how social performance should be measured (Hashemi, 2007). Academic researchers are therefore struggling to identify the appropriate variables to represent social performance. The average loan size and the targeting of female clients are the

most widely used social outreach indicators in microfinance re- search (Cull, Demirgü c- Kunt, & Morduch 2007; Mersland & Strøm, 2010) and are the variables used in this paper to represent social performance.

(i) Outreach to poor clients

Concern for the poor is a central biblical virtue. In fact, working is partly motivated by the opportunity to assist those in need. Average loan size is the most widely used indicator to indicate whether an MFI reaches poor customers. For MFIs offering some big loans alongside many small loans, their average outstanding loan balances do not fully reflect their social profiles, and the average loan does not necessarily reflect the clients' poverty level. Nevertheless, the average outstanding loan balance is constantly tracked by MFI boards, investors, and other stakeholders because it gives a rough measure of the MFI's poverty focus.

(ii) Targeting female clients

Microfinance and women have always been intrinsically linked. Since the experimental schemes in Asia and Latin America in the 1970s, microfinance has primarily targeted women (Aghion & Morduch, 2005). Women are more likely than men to repay their loans (D'Espallier, Guerin, & Mersland, 2011). In addition, by enabling women to develop or strengthen income-generating activities, microfinance is likely to increase their monetary income, their control over their income, and their bargaining power within the household.

As with the average loan, the percentage of female clients is a proxy for social performance that is in dispute. Overreliance on serving women may actually cause harm to women. For example, women may be taking out loans for their husbands, or they may end up being in charge of the families' monetary income, adding one more duty to a list that is often already unbalanced because of their sex. However, because servicing loans for women has been and continues to be at the forefront of the microfinance

Financial Performances Four underlying variables constitute the majority of an MFI's financial profits: operational income, financial costs, operational costs, and loan losses.

(i) Maximizing operational income

Operational income consists of the loan portfolio multiplied by the effective interest rate. Most MFIs still operate in markets in which they have some oligopoly power and can decide their price levels to a certain extent. In some markets, such as Ecuador, there are interest rate caps established by the government, but within those caps, MFIs determine the prices of their services.

(ii) Minimizing financial costs

A main difference between microfinance and regular banking is that finance costs are relatively less important than operational costs in microfinance. This difference occurs because operational costs are high and subsidized funding is available.

(iii) Minimizing operational costs

From a theoretical standpoint, operational efficiency is probably the most interesting variable in an analysis of the economic influence of religion. This topic also has the most developed academic literature pertaining to the economic influence of religion. McCullough and Willoughby (2009) present a comprehensive and critical review of this literature. They conclude that some types of religious beliefs, behavior, and cognition foster self-regulation and self-control, which in turn have positive implications in terms of stronger task diligence and persistence and a better capacity to change behavior according to the feelings and wishes of other people. In a principal-agent model, self-control should reduce agency costs and have a positive effect on orga- nizational efficiency.

In addition to self-control and self-regulation effects, reli- gion may stimulate work motivation by sanctifying work goals (Emmons, 1999). A series of studies shows that when people think of their work as a divine calling, they find their work more rewarding and spend more time on work (Wrezsniewski, McCauley, Rozin, & Schwartz, 1997), they are more commit- ted to work goals, and they are among the strongest believers in success at work (Emmons, Cheung, & Tehrani, 1998; Mahoney et al., 2005).

Wooten, Coker, and Elmore (2003) observed that religious NGOs were too focused on their religious missions at the expense of financial control. Likewise, some authors argue that Christian MFIs should have a triple bottom line—financial results, social results, and spiritual results—and that, for example, high client/staff efficiency ratios are incompatible with the achievement of spiritual results (Bussau & Mask, 2003).

A similar type of goal bias could be observed with the boards of religious organizations. Board members who represent religious organizations may focus primarily on the theological profiles of the organizations and the spiritual leadership of leader candidates. Thus, the leaders of such organizations may have the "right theology" but may have subpar management skills.

(iv) Minimizing loan losses

Modern microfinance was intended as a response to the high default rates in subsidized rural credit from the 1950s to the 1980s (Hulme & Mosley, 1996). Thus, the low default rates in microfinance are one of the industry's main achievements.

However, not all MFIs report low default rates. In our data set, the default rates, which are measured as the proportion of a portfolio that is more than 30 days in arrears (PaR30), range from 0% to 97%. Therefore, not all MFIs enjoy low default rates, and this variance probably indicates that keeping defaults down is to a large extent a managerial issue.

First, we use a broad range of financial performance measures but only two indicators of social performance: average loan size and percentage of female clients served. Though these are the mostly used social indicators in microfinance research and management, we admit that they do not necessarily indicate an MFI's social results. Therefore, if possible, future research should include additional indicators to study the social performance of MFIs. Moreover, we recommend researchers to look deeper into the female gender bias in microfinance.

Data and Methodology

This paper focuses exclusively on social and financial performance of 90 Islamic and conventional microfinance institutions. Data is update to 2014. Data is collected from microfinance regulatory authority of Bangladesh.

The representativeness of the sample is always an important issue. Although the MRA data are considered among the most representative data that are available for studying both Islamic and conventional microfinance industry, no data set is perfectly representative of the microfinance field. For instance, our set contains relatively few of the largest MFIs and does not cover the virtually infinite number of small savings and credit cooperatives active in the industry. Overall, we believe that our data-base provides a more representative image of the

microfinance industry compared with other available data sets, such as Mixmarket (www.mixmarket.org), which has a well-known large firm bias.

Variable	Obs	Mean	Std. Dev.	Min	Max
oss	394	189.5699	1107.404	0	13691
averageloan	471	7474.643	3267.208	1412.31	19173.55
loanloss	442	.0137557	.056668	0	.93
cpb	436	.071055	.1249029	0	1.81
loans	473	1.15e+09	8.81e+09	1458360	1.06e+11
portflio	436	26.52213	57.73138	0	905.77
roe	440	.3964091	1.020588	0	11.66
totalequity	320	4.85e+08	2.96e+09	173415	1.90e+10
femaleclie~s	472	127659.9	943311	78	9463607

Correlation

	oss	lloans~e	lloanl~s	lloans	lequity	cpb	female~s	portflio
oss	1.0000							
lloansize	-0.0687	1.0000						
lloanloss	-0.2202	-0.0252	1.0000					
lloans	-0.1311	0.4514	-0.2383	1.0000				
lequity	-0.3224	0.2284	-0.1519	0.9030	1.0000			
cpb	-0.0659	-0.0159	-0.1273	0.0935	0.1045	1.0000		
femaleclie~s	-0.1300	0.1485	-0.1438	0.6529	0.7004	0.0537	1.0000	
portflio	0.0121	-0.0450	-0.0960	0.0487	0.0507	0.9646	-0.0169	1.0000

Difference GMM

Difference GMM

	Model 1	Model 2	Model 3 Mo~4	diff22robust
L.OSS	0.170	0.0595	0.170	0.0595
	(0.76)	(0.23)	(0.89)	(0.51)
L2.OSS		-0.623		-0.623***
		(-1.92)		(-3.41)
CPB	-299.3**	-259.3	-299.3*	-259.3**
	(-2.69)	(-1.81)	(-2.55)	(-2.84)
Portflio	0.406**	0.208	0.406*	0.208
	(2.66)	(0.21)	(2.51)	(0.35)
ROE	16.82	36.48	16.82	36.48*
	(1.11)	(1.55)	(1.42)	(2.33)
Femaleclients	-0.00000176	-0.00000153	-0.00000176	-0.00000153
	(-0.37)	(-0.30)	(-1.29)	(-1.59)
lloansize	0.140	21.50	0.140	21.50
	(0.01)	(1.26)	(0.02)	(1.43)
lloanloss	-11.88**	-12.64*	-11.88**	-12.64**
	(-2.72)	(-2.45)	(-2.87)	(-2.73)
lloans	6.082	11.69	6.082	11.69*
	(0.70)	(1.10)	(0.99)	(1.99)
lequity	-8.468	-25.83	-8.468	-25.83
	(-0.99)	(-1.93)	(-1.05)	(-1.86)
Dummy Islamic	0	0	0	0
	(.)	(.)	(.)	(.)
Constant	0	0	0	0
	(.)	(.)	(.)	(.)
Observations	49	34	49	34

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

System GMM

	Model 1	Model 2	Model 3 Mo~4	system22ro~t
L.OSS	-0.0621	-0.132	-0.0621	-0.132
	(-0.44)	(-1.06)	(-0.27)	(-0.60)
L2.OSS		0.133		0.133
		(1.48)		(0.96)
CPB	-309.1**	-287.8*	-309.1**	-287.8*
	(-2.99)	(-2.46)	(-2.62)	(-2.07)
Portflio	0.414**	3.018***	0.414*	3.018
	(2.90)	(3.34)	(2.55)	(1.10)
ROE	11.66	1.960	11.66	1.960
	(0.83)	(0.12)	(1.01)	(0.05)
Femaleclients	-0.00000275	0.00000278	-0.00000275	0.00000278
	(-0.62)	(0.42)	(-1.45)	(0.49)
lloansize	-4.778	86.91***	-4.778	86.91
	(-0.44)	(5.36)	(-0.54)	(0.95)
lloanloss	-12.90**	-9.996*	-12.90***	-9.996*
	(-3.24)	(-2.05)	(-3.40)	(-2.00)
lloans	9.058	-14.75	9.058*	-14.75
	(1.21)	(-1.52)	(2.33)	(-0.63)
lequity	-16.33*		-16.33**	
	(-2.00)		(-2.65)	
Dummy Islamic	25.52	138.3**	25.52	138.3
	(0.92)	(2.66)	(0.95)	(1.08)
Constant	114.3	-583.2**	114.3	-583.2
	(0.96)	(-2.62)	(0.94)	(-1.03)
Observations	82	86	82	86

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Sargan Test

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(17)   = 21.22822

Prob > chi2 =   0.2162

According to Difference and System GMM both of methods indicate similar results for most of the variable. For social peroformance it is OSS of microfinance institutions in case of system GMM while difference GMM shows it insignificant. Interestingly Bank size is also significant for System and difference GMM model but in robust model. Savings rate is significant in conventional MFIs in system GMM model but insignificant in difference GMM model. Operational income is insignificant in both System and difference GMM model. The major finding is the significant relationship of political stability and education to the savings deposit of commercial banks. At the same time dummy Islamic also found significant in case of System GMM.

Having found focus variables have significant effect on banks deposits, and control variables have similar effect in most of the cases, it is needed to determine the appropriate method from the two methods. In selecting appropriate model, we just concern difference and System GMM Method. From both tables, different models and diagnostic tests, we can summarize that system GMM is most suitable for this study. According to system GMM, political stability and education has significant effect on customer deposits of commercial banks. Result also shows that religion has also significant impact on banks customer deposits.

System GMM may cause consistency problem. To solve that we run sargan test but it can't be run for difference GMM. So for our study in this case we prefer system GMM model and that it proves the exiting effect of religion, political stability and education.

With an Islamic microfinance dummy we wanted to see the effect of religion on development factors. As indicated in the above table our main findings for microfinance institutions are broadly confirmed after controlling for time fixed effects. The coefficient is significantly higher than the comparable coefficient for conventional microfinance institutions, and does not support arguments that Islamic microfinance are less likely to perform.

This result shows the performance of Islamic and conventional MFIs applying system GMM. We can see here loans loss and advances are negatively significant with financial performance of microfinance institutions. It implies that the less loan loss will lead to the better performance of micro finance institutions. Cost per borrower and female clients also found significant

relationship with the performance of microfinance institutions. Average loan size and total equity do not have any significant relationship with the performance of MFIs.

Interesting part of this result is that Dummy Islamic found highly significant to the performance of microfinance institutions. That implies that Islamic principles have significant effect on the performance of Microfinance Institutions. This result supports the possible success of the proposed model that based on Islamic rules and principles.

Threshold Regression

This paper pays particular attention to the poorest of the poor and questions whether and how improvement of the percentage of poorest clients served by an MFI will affect its financial sustainability and the relationship with average loan size proxied for depth of outreach. Using a cross-sectional data sample of 90 MFIs in Bangladesh as of December 2013 by applying the threshold regression model developed by Caner and Hansen (2004). Threshold regression models or sample splitting models have wide application in economics and applied econometric practice (Hansen 1999; Hansen 2000).It allows to endogenously determine the threshold level(s) at which the sample is split. It treats the threshold value(s) as unknown instead of arbitrarily deciding the splitting point.

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Test of Null of No Threshold Against Alternative of Threshold
Allowing Heteroskedastic Errors (White Corrected)


Number of Bootstrap Replications:   5000
Trimming Percentage:                 .15

Threshold Estimate:                 5455.12012
LM-test for no threshold:            .
Bootstrap P-Value:                   1

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By applying the sample splitting technique of Caner and Hansen (2004), we did not get any significant threshold value.The corresponding p-value (1) of the SupW test reported in Table 3 suggests the no existence of the threshold.

The results show that poverty targeting, proxied by the percentage of the poorest, has not any significant threshold effects on sustainability. The trade-off and complementary relationship between financial sustainability and depth of outreach in terms of average loan size are observed simultaneously in this dataset. This result rejects the hypothesis of micro-finance social – financial performance paradox.

The linear regression for the full sample shows that MFIs' financial sustainability is positively related with average loan size in the case of both before and after dealing with the potential endogeneity problem. These results are compatible to most of the existing literature supporting the trade-off theory. Trade-off occurs when MFIs serve a mixed clientele with a relatively high percentage of the poor and the poorest. On the other hand, when the percentage of the poorest is relatively low and MFIs are actually serving a large number of marginally poor or non-poor clients, this positive correlation can be considered as a complementary relationship since wealthier clients demand bigger loans. In this case, there exists the possibility of mission drift. However, we lack enough information on other poverty levels of clients except for the percentage of the poorest.

A better control over operating cost in low poverty targeting MFIs can greatly improve their efficiency and further financial sustainability levels. However, cost per borrower, calculated as the ratio of total operating expense divided by total number of active borrowers, is much smaller in high poverty targeting MFIs than in low poverty targeting MFIs in this sample due to the larger total number of borrowers. This finding is consistent with Littlefield et al (2003) who point out that programs serving very poor clients perform better than others in terms of cost per borrower. Portfolio yield shows a positive relationship with financial sustainability linearly and non-linearly. Yet, the estimated coefficient in high poverty targeting MFIs is much smaller than it is in low poverty targeting MFIs (0.885 versus 1.757). That is, high poverty targeting MFIs have to charge higher interest rates in order to achieve the same level of financial sustainability as low poverty targeting MFIs. Statistics on the subsamples show that the mean value of portfolio yield in low poverty targeting MFIs is slightly higher (36.6%) than it is in high poverty targeting MFIs (35.3%).It is in accordance with Conning (1999) who recommends MFIs to charge higher interest rates to poor borrowers in order to achieve financial sustainability.

Loan loss reserve is negatively correlated with financial sustainability. The negative coefficient in high poverty targeting MFIs is smaller (-2.713) and significant at 5% level while low poverty targeting MFIs significantly correlated with sustainability at 1% level. This suggests that a better control over default risk in low poverty targeting MFIs can largely improve their sustainability. In fact, Table 6.2 shows that high poverty targeting MFIs have higher mean value of the reserve level than low targeting MFIs. Gross loan portfolio has positive effects on financial sustainability in the full sample linear regression and the threshold regression with a higher coefficient in high poverty targeting MFIs. Given that high poverty targeting MFIs are providing much smaller loans in average, the total size is smaller than low poverty targeting MFIs.

Concluding Remarks and Policy Implication

Our inquiry is centered on the effect of religiosity and threshold on social and financial performance of Microfinance Institutions. From the empirical study we find that religion has significant effect on microfinance institutions performance while threshold does not have effect on microfinance at least in case of Bangladesh. Our findings present important insights for Islamic microfinance manager and donors as well as policy makers. We thus recommend managers and donors to ensure that Islamic inspiration translates into benefits for clients. Government agencies and social impact investors may also help MFIs in the wider inclusion of the poorest population. Social performance will harmonize the financial performance of microfinance institutions, so the MFIs authorities should not be worried about the financial stability while focusing on outreaching the poor.

However, there are shortcomings too. For instance, the often-refuted-and-repeated "high financing costs" criticism against conventional MFIs may be investigated in a more scientific manner by analyzing financial data of a sample of MFIs by undertaking a cross-sectional comparison of costs of undertaking various operations. It would also be pertinent to get more systematic information for a number of countries on the size of Islamic microfinance relative to the overall microfinance industry. Additionally information on how the Islamic microfinance component is performing in relation to conventional microfinance based on a set of benchmark indicators should be examined. On the overall, our study may help create incentives for researchers to pursue further inquiries into an area extremely promising.

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