Efficiency analysis of major microfinance institutions in Bangladesh: a Malmquist index approach

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Abstract  Microfinance institutions (MFIs) have dual objectives—reaching under privileged households for poverty easing and achieving financial sustainability. This paper investigates the efficiency of major 15 MFIs in Bangladesh using Malmquist index (MI) over the period 2008–2012. A balanced panel dataset of 75 observations is used. The results from MI are decomposed into three efficiency scores—technical efficiency (TCH), scale efficiency (SE) and pure efficiency (PE). The empirical findings indicate that MFIs are experienced an excellent annual efficiency progress (93.5 %) which was mainly because of PE. PE measures the capacity of optimizing minimum input to produce maximum output by reducing production wastage. This outstanding growth was an outcome of country’s ever best economic settings before 2008. However, from 2009 onward, a substantial efficiency regresses is observed. The results also signify that the major MFIs have less capacity to work at their optimal scales. The contribution of SE is very low (only 2.2 %) compared to total efficiency progress. Findings from TCH indicate that the overall frontier is moving relatively slow in an outward direction (only 3.7 % of TCH progress).

Keywords  Malmquist index · Efficiency · Microfinance institutions · Bangladesh

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1 Introduction

Microfinance institutions (MFIs) have proven to be an effective and powerful tool for poverty alleviation (Hermes et al. 2011; Habib and Jubb 2015; Sengupta and Aubuchon 2008). Through MFIs, the poor households who do not have direct access to the current payment mechanism because of their low credit score getting access to the financial resources and turning into economically productive recourses. Such a linkage contributes the developing countries in the long term strategic policy for poverty alleviation and economic sustainability (Copestake 2007; Gutierrez-Nieto et al. 2007; Sengupta and Aubuchon 2008). Mentioning the tremendous achievement of noble laureate Muhammad Yunus and his Grameen Bank in poverty easing, Sengupta and Aubuchon (2008) revealed the importance of efficient microfinance operations in poverty alleviation in Bangladesh. Since the inception in the 1970s, MFIs grew as an economic development approach to benefit low-income people in rural and urban areas of Bangladesh. Now, Bangladesh has few giant MFIs as well as plentiful medium and small MFIs.

Over the last four and half decades, the MFI industry in Bangladesh has evolved as a mature industry. A total 24.60 million people are under the purview of MFIs and over 93 % of the borrowers are women. Over the study period, the total number of MFIs is increased by 11.02 % annually. Countrywide, a total 650 licensed MFIs are operating with 14,674 branches. The total loan distribution is increased by 13.10 % (from BDT261.18 billion in 2009 to BDT432.28 billion in 2013). The total savings is also substantially increased by annual 8.67 % from BDT 50.61 billion in 2009 to BDT 93.99 billion in 2013. The loan recovery rate is dropped negligibly (0.048) from 97.93 % in 2009 to 97.69 % in 2013. According to the Microcredit Regulatory Authority (MAR), the growth is now in equilibrium. Since the market is saturated, increasing the number of branches or borrowers is not suitable (Habib and Jubb 2015). Their study revealed that without increasing the number of outlets, MFIs can still contribute in further poverty alleviation by achieving efficiency in performance. Efficiency is a relative measure of performance. A decision making unit-DMU (here MFIs) is efficient if it achieves the highest ratio amongst all the DMUs analyzed. Thus, it is now of immense need to examine whether MFIs in Bangladesh are operating efficiently. According to the central bank of Bangladesh (Bangladesh Bank), only 11 large MFIs represent 87 % of the total MFIs’ savings and 81 % of the total outstanding loans (for details, see at website: http://www.bangladesh-bank.org/). Thus, our study is designed to measure efficiency of these 11 and 4 consecutive MFIs (major 15) in Bangladesh representing 91 % of total MFIs’ savings.

The MFI industry is challenged to meet a “double bottom-line” of outreach (i.e., providing financial services to the below earners) and financial sustainability (i.e., covering operational costs) (Bassem 2012; Copestake 2007; Annim 2012). In recent time, profitability and financial performance becomes the watchword for governance issue. However, profitability cannot be the primary goal for MFIs. Alternatively, an overly social vision can lead to financial bankruptcy of a MFI (Bassem 2012; Copestake 2007). Sengupta and Aubuchon (2008) studied the evolution of MFIs in India which revealed that the outreach is low and ensuring profitability is difficult. In Bangladesh settings, the past studies on MFIs have examined only the ability to alleviate poverty by MFIs (Mazumder and Lu 2015; Mahjabeen 2008; Habib and Jubb 2015) and have completely ignored their efficiency. Hence, the efficiency examination of major MFIs in Bangladesh is missing.

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1 The MFI industry in Bangladesh operates under the direct supervision of The Microcredit Regulatory Authority (MRA). A detailed analysis of improvement and development of Bangladesh microfinance sector is available at http://www.mra.gov.bd/index.php?option=com_content&view=frontpage&Itemid=74.
Among the other techniques of efficiency measurement, e.g. ratio (Farrington 2000); Fisher index (Kuosmanen and Sipilainen 2009); Tornqvist index (Diewert and Fox 2010), Malmquist index (MI) is the often used method (Bassem 2014; Liu et al. 2013a, b). The three major benefits of using MI comparing with Fisher and Tornqvist index are: (i) MI does not require presumption of profit minimization or cost minimization, (ii) no need for input/output prices, and (iii) MI decomposes the results into efficiency change (catching up) and technical change (TCH) (changes in the best practice). In order to calculate MI, we use a non-parametric data envelopment analysis (DEA) pioneered by Charnes et al. (1978). DEA enables to use multiple inputs and multiple outputs for measuring efficiency of a DMU. On top of that, unlike stochastic frontier approach, DEA does not require additional assumptions for MFIs’ business process. Thus, using DEA and MI for measuring MFIs’ efficiency is appropriate.

This paper contributes in three different aspects. Firstly, to the best of authors’ knowledge, for the first time, DEA and MI are used in Bangladesh settings for measuring the efficiency of MFIs. Then it decomposes the results into three efficiency scores- technical efficiency, scale efficiency (SE) and pure efficiency (PE). This breakdown helps to examine the major sources of inefficiencies among the selected MFIs. Secondly, the findings highlight the need of additional government intervention to protect the rights of the borrower. Finally, the MFI industry is emphasized for a diversification to access of funds and innovations in distribution mechanism. The empirical results signify that the major MFIs have less capacity to work at their optimal scales and to achieve technological progress.

This paper is presented in six sections. The following section describes a brief literature on productivity of MFIs. Section 3 presents the DEA, MI and data. Discussion on empirical results is presented in Sect. 4. Limitations and future research scope is shown in Sect. 5 followed by conclusion in Sect. 6.

2 Literature review

The MFI industry has played a dynamic role for improving and maintaining the livelihoods of rural people in Bangladesh (Tenaw and Islam 2009; Khandker 2005; Khandker 1998). Their study revealed that the main income sector in Bangladesh is agriculture but suffers from poor technology, poor infrastructure, and fragile market. Khandker (2005) recommended microfinance as only mechanism through which these obstacles can be overcome in Bangladesh. Worldwide, MFIs offer small-scale credit to the producers and business. MFIs also provide training and organizational support for empowering the poor households, especially women. Particularly in Bangladesh, MFIs offer credit to group borrowers that helped in loan recovery from joint effort (Khandker 2005; Mark and Khandker 1998). Like these papers, Kereta (2007) evaluated MFIs’ efficiency in Ethiopia from outreach and financial sustainability angles using data obtained from both primary and secondary sources. The paper revealed that the industry’s outreach rises in the period from 2003 to 2007 on average by 22.9 %. It identified that while MFIs reach the very poor; their reach to the women, in particular is limited (38.4 %). By now, a good number of papers have attributed the success of outreach by MFIs ignoring their financial efficiency.

In the literature of MFIs, the term efficiency refers to the ability of producing loan portfolio and active borrower out of its capital and human labor. MFIs has twofold objectives which are contradictory in nature (Agarwal and Sinha 2010). Considering the core
of MFIs’ efficiency, Bassem (2014) divided MFIs’ efficiency into two parts; financial efficiency and social efficiency. Besides, the idea of financial efficiency of MFIs was first set by Sanchez-Robles (1997) in the name of production approach. According to him, financial efficiency of MFIs depends on its technical efficiency, i.e. the larger the productivity in terms of pure and scale operation, the higher the efficiency. In addition to that, Sanchez-Robles (1997) provided another concept of intermediation efficiency. He classified these two efficiency based on the choice of inputs and outputs. A similar definition for production approach and intermediation approach is also found in the later studies (Gutierrez-Nieto et al. 2007; Haq et al. 2010; Copestake 2007; Bassem 2008, 2012). By the definition, production approach defines the first objective of reaching the poor and intermediation approach refers to the second objective of profitability and sustainability. Recently, Bassem (2014) named the third approach called social efficiency. The earlier study of social approach of MFIs efficiency was given by Sanchez-Robles (1997) that defines MFIs’ efficiency is not how they must gain, rather how well they manage their resources.

An extensive literature has attempted to study financial efficiency of MFIs using both the parametric and nonparametric approaches. Their methodology was limited to ratio analysis and descriptive analysis. For instance, Arthur et al. (2013) evaluated financial efficiency of 266 MFIs from Uganda. They used simple t-test to measure the rank in their selected groups. According to their recommendation, a worldwide acceptable framework should be in practice. This particular action will help in analyzing firms’ liquidity, profitability and sustainability with common methodology. Oteng-Abayie et al. (2011) considered 135 MFIs from Ghana and measured the social efficiency of MFIs using ratio analysis. Their findings showed that MFIs are not efficient and major sources of inefficiency are from technological progress and SE. Their recommendation was about the human capital improvement through training and providing logistics so that the investment of MFIs never wastes.

The imperative nature of MI is examining efficiency of a DMU using multiple inputs and outputs. Moreover, the capacity of comparing a DMU’s efficiency between two consecutive periods makes MI as the most useful tool in efficiency measurement (Zofio 2007; Coelli and Rao 2005; Bassem 2014). Bassem (2014) examined 33 Middle East and North Africa (MENA) MFIs using MI. They examined from 198 balanced panel dataset over a period of 2006–2011. Their study revealed that MFIs in MENA experienced a progress by 4.9 % annually which was mainly attributed to technical efficiency change. The study also revealed that the industry as a whole has exhibited a decline in technological change (2.9 %) and suggested that there has been decline in the efficiency of the best practicing MFIs. Kipesha (2013) evaluated efficiency of MFIs in Tanzania by incorporating financial and nonfinancial efficiency matrix. The study used balanced scorecard approach with five dimensions of financial, social, customer, learning and internal business process. The study reviewed low average financial efficiency among MFIs.

Across the regions, a number of studies have examined the efficiency of MFIs using various measures/variables. For instance, Farrington (2000) presented a number of accounting variables in order to reflect efficiency. These includes administrative cost ratio, loan officer to total number of loans, loan portfolio, outstanding loans, and capital structure. Among the non-parametric studies, Bassem (2014) examines efficiency of MFIs using operating expenses, number of staffs, gross loans, number of loans and other income. After a brief review of variables used in MFIs’ efficiency, Haq et al. (2010) used number of staffs to operating expenses, total administrative expenses, loan portfolio, and total savings as the variables for efficiency calculation. Based on the above literature, we choose the intermediation approach of efficiency calculation for the selected MFIs in Bangladesh.
3 Methodology

3.1 Malmquist index

Based on the valued work of Malmquist (1953) and Caves et al. (1982), we use the non-parametric framework of MI. By-products of MI are technical efficiency change (TEC) and TCH. Again, TEC can be decomposed into SE and PE. These sources of efficiency changes help researchers for examining efficiency from different perspectives. Moreover, the decomposition of MI helps in further modeling and innovation of efficiency analysis. Fare et al. (1994) demonstrated the use of DEA for calculating MI. If the input and output vector of a production unit is presented by \( x' \) and \( y' \) and \( (t) \) stands for time period, the output set of the production process can be defined as:

\[
P'(X') = Y' : X' produces Y'
\]  

This output set by Chou et al. (2012) satisfies notion of disposability of inputs and outputs since it assumed to be closed, bounded and convex (Coelli et al. 2005). A distance function for the output set can be designed as follow:

\[
D'(x', y') = \min \left( \theta : \left( \frac{y'}{\theta} \right) \in P'(x') \right)
\]  

Here, \( \theta \) stands as radial factor for adjusting output vector’s position. Since the boundary of \((x, y)\) is defined as the set of \( (\theta) = (1, 1) \), Eq. (2) corresponds to BBC (variable returns to scale) model. The linear programming for Eq. (2) is;

Subject to

\[
\sum_{t=1}^{T} z' x_{tn} \leq x'_{tn}, \quad n = 1, \ldots, N
\]

\[
\sum_{t=1}^{T} z' y_{tm} \geq y'_{tm}, \quad m = 1, \ldots, M
\]

\[
z' \leq 0, \quad t = 1, \ldots, T
\]

Here, \( z' \) is the intensity variable.

Considering two consecutive time frames e.g., \( t \) and \( t+1 \), and combining the distance function of Eq. (2), MI can be shown as follow:

\[
MI(y', x', y_{t+1}', x_{t+1}') = \left[ \frac{D'(x_{t+1}', y_{t+1}')} {D'(x', y')} \times \frac{D'^{v+1}(x_{t+1}', y_{t+1}')} {D'^{v+1}(x', y')} \right]^{\frac{1}{2}}
\]  

Equation (3) can be transformed into;

\[
MI = \left[ \frac{D'^{v+1}(x_{t+1}', y_{t+1}')} {D'^{v}(x', y')} \right] \left[ \frac{D'(x_{t+1}', y_{t+1}')} {D'^{v+1}(x_{t+1}', y_{t+1}')} \times \frac{D'(x', y')} {D'^{v+1}(x', y')} \right]^{\frac{1}{2}}
\]
Here,

\[
\text{Technical efficiency changes (TEC)} = \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^t(x^t, y^t)} \quad (6)
\]

\[
\text{Technical efficiency (TCH)} = \left[ \frac{D_t^t(x^t, y^t)}{D_t^{t+1}(x^{t+1}, y^{t+1})} \times \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right]^{\frac{1}{2}} \quad (7)
\]

Output oriented MI, as shown above in Eq. (4) can be decomposed as a product of TEC and TCH as presented in Eq. (5). Keeping the input vector constant for the period t, the distance function explains the major changes until the period t + 1. Here, D is used as distance function by taking the DMU in the assessment to desired frontier. In Eq. (4), the first part of the ratio \( \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^t(x^t, y^t)} \) expresses the concept of “Catch-Up” and the second part \( \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \) denotes “Frontier Shift” of the DMU from time t to t + 1 (Cooper et al. 2007). The frontier shift assumes the first part as the target benchmark and captures the technical efficiency changes for the following period. In order to calculate productivity changes of a DMU, at least two frontiers must be considered. A value of MI more than one defines productive growth and less than one indicates productivity decline in a given adjacent time. Note that, a value of 1 for all MI, TEC and TCH explains that the efficiency remains equal compared to period t in t + 1. Again, a value of more than 1 represents progress and less than 1 explains regress in efficiency.

Further decomposition of TEC, Eq. (6) is shown below:

\[
\text{TEC} = \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^t(x^t, y^t)} \right] = \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \times \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \times \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \quad (8)
\]

Here, DVRS is the output distance function for variable returns to scale. The first part of Eq. (8) is named as PE that describes pure change in technical efficiency in a relative form of defined consecutive time period. And, remaining part of Eq. (8) stands for describing change in effect due to economics of scale and denoted by SE. Thus,

\[
\text{PE} = \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \quad (9)
\]

\[
\text{SE} = \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \times \left[ \frac{D_t^{t+1}(x^{t+1}, y^{t+1})}{D_t^{t+1}(x^{t+1}, y^{t+1})} \right] \quad (10)
\]

Combining Eqs. (4) and (8), an extended version of Eq. (4) is;

\[
\text{MI} = \text{PE} \times \text{SE} \times \text{TCH} \quad (11)
\]

### 3.2 Data and variables

This study evaluates the efficiency changes in major 15 MFIs in Bangladesh using MI. Two inputs are selected for the analysis namely X1: financial cost ratio (%) and X2: operating expenses (in million BDT). This paper includes two outputs, Y1: net savings (in million BDT) and Y2: return on asset (%). Data are collected from the annual reports.
published by MRA. The study covers data from 2008 to 2012. Table 1 presents the descriptive statistics of the variables.

Table 1 presents the inputs/outputs variables including their mean, standard deviation, minimum and maximum. As we can see from Table 1, the variables that are used in the study are composed of data with outliers. There are some institutions (i.e., BRAC, CARSAF, UDDIPAN, and RDRS) with extreme values in the list. MFIs with extreme values influence the total study which is evident in the following sections.

4 Empirical results and analysis

The productivity change of MFIs can be attributed to either change in technical efficiency (MFIs are getting closer to the production frontier over the time) or change in the technology (the changes in production frontier comparing with time). The MI is the product of technical efficiency change and technological change explaining the total efficiency. Again, the changes in technical efficiency can be decomposed into two main components—PE and SE. PE refers to MFIs’ ability to optimize waste by producing maximum outputs from inputs, or by using as little input as output production allows. Likewise, SE refers MFIs’ talent to work at most advantageous scale. Efficiency changes among the selected MFIs’ are summarized in Table 2.

Overall, the MI progress by the selected MFIs are averaged in 93.5 % per year and suggests an surprising improvement in efficiency of MFIs over the period (2008–2012). Similarly, as shown in Table 2, the average annual TEC change is 87.9 % while the rate of TCH is 3.7 % only. Again, the results in MI show that the productivity has been

<table>
<thead>
<tr>
<th>Table 1 Descriptive statistics (2008–2012)</th>
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<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>Inputs</td>
</tr>
<tr>
<td>X1: financial cost ratio (%)</td>
</tr>
<tr>
<td>Min</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>SD</td>
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<tr>
<td>X2: operating expenses (in million BDT)</td>
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<tr>
<td>Min</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>SD</td>
</tr>
<tr>
<td>Outputs</td>
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<tr>
<td>Y1: net savings (in million BDT)</td>
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<tr>
<td>Min</td>
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<tr>
<td>Average</td>
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<tr>
<td>SD</td>
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<tr>
<td>Min</td>
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<td>Average</td>
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<td>SD</td>
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</table>
significantly dropped in the year 2009–2010 and 2010–2011. It is reported that the overall productivity has been declined in the study period by 198 and 47% respectively. However, during 2011-2012, the efficiency has been lifted with 80.2%. The results point toward the MI as a whole influenced by PE with an annual progress of 83.8% alone.

From Table 3, it is observed that the main source of MI for MFIs is TEC (87.9% progress on an average). The results explain that 13 (out of 15) MFIs have shown improvement in TEC. Such a result suggests that there has been deterioration in the efficiency of the best practicing MFIs. Furthermore, it is also noticed that all MFIs are able to use their input for the best output production during the study period (Table 3) except for “Charcha”—a regress by 7.8% annually and the “SSS” by 7.3% regress annually. The highest average efficiency is scored for the “CARSAF” by 380.5% annually and the lowest positive change is scored by the SSS with 0.8%. Only “Charcha” scores 5.5% annual regress.

Figure 1 depicts all the envelopments of inputs and outputs. It is seen that only 4 DMUs are far away from the total sampling distribution and participating in frontier construction. This pictorial situation has been described at earlier section illustrating that few of MFIs are in outperforming range that resulted in excess efficiency change during the study period. Figure 2 is the simple presentation stating the trend of productivity changes among

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Efficiency change summary</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>TCH</td>
</tr>
<tr>
<td>2009–2010</td>
<td>0.914</td>
</tr>
<tr>
<td>2010–2011</td>
<td>1.056</td>
</tr>
<tr>
<td>2011–2012</td>
<td>1.161</td>
</tr>
<tr>
<td>Mean</td>
<td>1.037</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 3</th>
<th>MI summary for major MFIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMU</td>
<td>TCH</td>
</tr>
<tr>
<td>ASA</td>
<td>1.000</td>
</tr>
<tr>
<td>BEDO</td>
<td>1.018</td>
</tr>
<tr>
<td>BRAC</td>
<td>1.093</td>
</tr>
<tr>
<td>BuroB</td>
<td>1.040</td>
</tr>
<tr>
<td>CARSAF</td>
<td>0.990</td>
</tr>
<tr>
<td>Charcha</td>
<td>1.030</td>
</tr>
<tr>
<td>ISDCM</td>
<td>1.000</td>
</tr>
<tr>
<td>JCF</td>
<td>1.090</td>
</tr>
<tr>
<td>PMUK</td>
<td>1.013</td>
</tr>
<tr>
<td>RDRS</td>
<td>1.010</td>
</tr>
<tr>
<td>SFDW</td>
<td>0.975</td>
</tr>
<tr>
<td>SSS</td>
<td>1.115</td>
</tr>
<tr>
<td>TMSS</td>
<td>1.068</td>
</tr>
<tr>
<td>UDDIPAN</td>
<td>1.068</td>
</tr>
<tr>
<td>UPAMA</td>
<td>1.043</td>
</tr>
<tr>
<td>Mean</td>
<td>1.037</td>
</tr>
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the major 15 MFIs in Bangladesh during 2008–2012. It is also seen that the efficiency has been in pick during 2008–2009. However, this was again dropped significantly in the following 2 years and again went upward in 2011–2012.

**Fig. 1** Input-output combinations and their frontiers. *Source* Authors calculation using PIN DEA software Ve1.3
The MFI industry in Bangladesh has been explored largely in the 1990s, continued to increase farther with annual 22% growth rate for the period between 2004 and 2007 (Habib and Jubb 2015). Then in the late 2007, MFIs have faced some worrying trends and shown a continuous negative trend. The largest four MFIs in Bangladesh are ASA, BRAC, Buro, and Grameen Bank. These four MFIs are accounted for the two-thirds supply of country’s total microfinance. As a whole they stopped establishing new branches and recruiting new staffs in the early 2008 (Habib and Jubb 2015).

Having a favorable country specific economic condition and ample of foreign supply of MFI fund, there was a little importance of growing the industry with such a high speed. As in previous century, financial crises among the European countries and Asian region highly signify for a doubt on excess growth of financial industry. After realization in 2008, it seems that authorities of Bangladesh MFIs have stopped their excessive growth rate from the self-realization.

A new microcredit regulation (MRA-2006) may also be considered as an important factor behind such accelerating growth. The restrictions provided by MRA-2006 which is announced in 2002. They said that after 2006, MFI must get permission for setting up a branch anywhere in Bangladesh. As a consequence, during 2002–2006, MFIs have tried to establish as many branches as they could before 2007 resulted such an exponential growth in the industry. Most importantly, even if the world initiatives was still continuing for the favor of MFIs growth in 2008, MFIs in Bangladesh have controlled their operation and was initiating for the greater benefit of improving the industry with quality investment, poverty alleviation, entrepreneurship development and MFIs’ sustainability. Bangladesh has faced economic slowdown in the late 2008 with the start of global financial crisis. However, it was not significantly influenced among the major players of MFIs. During 2007, when ASA started to retreat its operation, BRAC continued expansion and again slowed down in mid-2008. Only “Buro” took large bank debt and needed to deploy it quickly, bucked the trend, and did not slow its growth until 2010. So far the publicly available information goes, MFIs in Bangladesh slowed their own growth to address two major problems: i) MFIs started to justify adverse growth resulting of the core microcredit market, and ii) MFIs became mindful about the management efficiency by the rapid growth from 2002 to 2007.

The signals of future mess were clear to MFIs in Bangladesh by 2007–2008 (Habib and Jubb 2015). Individual investors or market player of MFIs were misguided to evaluate their expense of interest. As a result, confidence among MFIs has dropped rapidly. Bangladesh was fortunate to avoid a descent into an unpredictable or spiraling deterioration. The
improvements in portfolio quality and operations in 2011 and 2012, combined with the more optimistic views of managers today indicate that more serious problems were avoided.

5 Limitations and future research scope

In this paper, it is evident from the empirical results that few MFIs (i.e., BRAC, CARSAF, JCF, UDDIPAN, and RDRS) have influenced the total calculation process. Hence, super-efficiency technology may employ to see the best performers in the study and draw benchmark accordingly. Again, a study with all MFIs (total 650) in Bangladesh would enrich the understanding of overall industry performance. Cross DEA and multistage DEA may use for answering any specific question related to MFIs’ productivity and macroeconomic conditions. Future research is necessary to assess a more detailed business issues in MFIs’ economic/social efficiency. From the methodological parts, using of the Kourosh and Arash Model (KAM) or meta-frontier DEA can explain the discriminations among MFIs’ efficiency with more explanations and accuracy.

6 Conclusion

This paper examines efficiency of major 15 MFIs in Bangladesh over the period 2008–2012 using MI with a balanced panel dataset of 75 observations. The empirical findings of this paper reveal that MFIs have overall productivity progress during the study period. Over the years, all MFIs have scored positive MI with an exception for “Charcha”. Overall, MFIs have experienced an efficiency progress by 93.5 % annually which is mainly attributed to pure efficiency change (PE). PE explains the ability of MFIs’ to avoid waste. The process includes a production technology for transforming as much as outputs from its input. This method of examining efficiency appreciates to reduce waste in any production technology. Moreover, results signify that the major MFIs have less ability to work at its optimal scale. Because, the SE is only 2.2 % annual progress while the PE is 83.8 % progress annually. In addition to that, the poor TCH of 3.7 % indicates that the overall frontier is moving outward in a relatively slow pace over the time. Overall, an important strategic implication for MFIs is that they need to chase for the TCH. Only then, they can meet the dual objectives of reaching poor people for poverty alleviation and financial sustainability. As well as, they also need to stress on policy development for achieving best practiced institutions in the coming years.

In the existing literature of efficiency of MFIs, this paper contributes in following issues. This paper examines MFIs in Bangladesh, which have attracted scarce research in developing economies so far (Liu et al. 2013a, b; Gutierrez-Nieto et al. 2007; Sengupta and Aubuchon 2008) despite of its importance in financial stability and economic welfare. In addition, this paper uses MI and then decomposes the results in three specific efficiency scores (i.e., TCH, PE, and SE). From the results, it is evident that MFIs in Bangladesh are less attractive in moving upward since the objectives of MFIs are not only to be profitable but also to alleviate poverty- thus may lead to a significant difference in efficiency scores.

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