

Efficiency of SMEs Financed under Conventional and Islamic Banks : Bangladesh Perspective¹

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Abstract

SMEs in Bangladesh have been giving priority in lending in their crucial contribution to the country's GDP. However, Bangladesh Bank, the central bank, conducted a field survey in 2012 to find out the impact of huge expansion of loans in 2010. Results of that survey show small sized and/or manufacturing enterprises contribute the most in productivity and employment generation. However, while considering efficiencies of SMEs with a distinction between financing from conventional or Islamic banks through Data Envelopment Analysis (DEA) with a sub sample of 283 enterprises from that survey data for the period 2009-2011 and one output variable (sales) and four input variables (capital, loans, expenditure and manpower), we find that almost the same technical efficiencies of SMEs financing under two types of banks-conventional (0.241) and Islamic (0.243). However, some slight differences of efficiencies of SMEs financed under two types of banks are observed while considering the size, sector and region where they are producing. These slight differences come from the concessional lending, access to finance and monitoring and supervision.

Key words : Data Envelopment Analysis (DEA), SMEs, Constant Return to Scale (CRS), Conventional Banks, and Islamic Banks, Bangladesh

1. INTRODUCTION

High growth in industrial loans was one of the concerns in monitoring credit situation of Bangladesh in 2010. It was then widespread that SME loans disbursed to industries had been diverting to unproductive sectors because investment in stock market and housing sector was also growing at that time. On that background, in 2012 Bangladesh Bank (BB)

1. The views expressed in this paper are those of the authors' own and do not necessarily reflect those of Bangladesh Bank.

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made an in-depth analysis for causes of high growth of industrial loans and its economic impact through a field survey of 451 enterprises which borrowed from banks and financial institutions. The objectives of that survey were to evaluate the financial situation of borrowing enterprises before and after utilizing SME loan; to check the contribution of SME sector in creating employment and to analyse economic impact of expansion of SME loans, etc. However, the efficiency of SMEs, a growing sector in Bangladesh remains unobserved.

In this regard, this paper attempts to find the efficiency of SMEs in Bangladesh which borrow loans from various types of banks. The analysis of this paper is based on the data collected from field survey conducted by BB on SMEs loans and its impact in 2012. For applying Data Envelopment Analysis (DEA), we use a sub sample of 283 enterprises of that survey. Of 283 enterprises, 167 are categorized as enterprises borrowing loans from 26 conventional banks and the rest 116 are categorized as enterprises borrowing loans from four Islamic banks. Islamic banks are those which disburse loans under Islamic Shariah. Enterprises are categorized further in consideration of their size, the sector in which they are contributing and the region where they are dealing in. Most of the enterprises are small sized, contributing to business sector and located in urban areas.

The objective of this paper is to find the efficiency of SMEs borrowing loans from conventional and Islamic banks through DEA method. For this purpose we consider sales as an indicator of efficiency of SMEs which depends on capital, loans, expenditure and employment. This paper has been divided into five sections. Section 2 briefly discusses on findings of some previous studies. Section 3 deals with methodology. Section 4 highlights discusses the analysis of the empirical results and finally, the last section, Section 5 concludes the findings of the study

2. LITERATURE REVIEW

Bangladesh Bank (2013) conducted a field survey of 451 enterprises which borrowed from banks and financial institutions and collected data from 2009 to 2011. The survey finds structural changes both in manpower and capital of surveyed enterprises indicating transformation of small to medium sized enterprises. Loans not only generate regular funding of existing borrowing enterprises but also create opportunities of being new entrepreneurs. In case of generation of employment, small sized and/or manufacturing enterprises contribute the most. Growth in per capita value addition of small and medium enterprises as a measure of productivity increases which in turn contributes progressively to GDP. Finally, the survey finds positive impact of overall economic activities of SMEs which was the outcome of high growth of loans with a comparatively low interest rate.

There are many researches in this field of SMEs where profit, cost, income and other x-efficiency have been estimated over the past decade. However, recently various efficiencies measurements to assess performance of the institutions using DEA (Non-parametric) and SFA (parametric) have been investigated in this field. The main findings of some of the previous studies applying DEA are stated below.

Kumar (2014) analyzes the technical and allocative efficiency of Indian banks for the period of 2008-2012. He uses Data Envelopment Analysis (DEA) to estimate technical and profit efficiency (PE) of 66 Indian banks (26 public, 19 private and 21 foreign banks). A two-stage approach is applied to estimate and validate the results of technical efficiency under two scales of economics— Constant Returns of Scale (CRS) and Variable Returns of Scale (VRS). Profit efficiency is estimated by employing DEA at VRS. Results indicate that small public sector banks reported higher operational technical efficiency (OTE) scores than larger public sector banks, while large and small private sector banks reported improvement on OTE scores over the period. On the contrary, small and large foreign banks reported decreasing OTE scores after 2008 and 2009. No significant change in PTE scores of small and large public sector banks is observed. Unlike public sector banks, private banks yield heterogeneity in PTE scores and small foreign banks reported a trend of decreasing pure technical efficiency (PTE) scores. More results show that large public sector banks had better scale efficiency in comparison with small public sector banks. SE scores of large and small foreign bank decreased during the study period. Finally, large public, private and foreign sector banks were more profit efficient than small and medium banks in their respective groups.

Yadav and Katib (2015) investigate the X-efficiency of nine financial institutions in Malaysia to identify the factors responsible significantly for the efficiencies. For this purposes they use the two-stage DEA and data for the period 2006-2012. The findings show that the average TE of DFIs of Malaysia is 78 percent. Two banks (BPMB & SCC) reflect as benchmark institutions by DEA efficiency scores. Moreover, BSN as a saving institution, have exhibited decreasing return to scale (DRS) in two years i.e., 2009 and 2012. On the other hand, BPMB and SCC have experienced CRS during the period. SMEs' banks have reflected DRS during the period 2009-2012. During the two periods 2008-2009 and 2010-2012, CGC and Agro bank have also experienced DRS. The results of the second-stage DEA (OLS regression analysis) reveal that the banking indicators included in this analysis are related to the efficiencies— some are positively and others are negatively related significantly that drive higher income in the Malaysian economy.

Purwanto et. al. (2014) work on SMEs to estimate their efficiencies using DEA at Salatiga in Indonesia. Due to increasing exchange rate in 2013, the impact on Indonesia's industries especially tofu enterprises have been studied for finding the efficiencies of that period. The primary data are collected from interviewing 31 manag-

ers out of 66 managers of the selected enterprises. The results show that the maximum enterprises are inefficient (23) whereas two SMEs are overall efficient, eight SMEs are efficient (TE) and four SMEs were efficient in terms of scale (SE). The suggestion of this paper is that inefficient SMEs should maximize their output factors by minimizing the input factors.

In Bangladesh, there are several studies on the performance of SMEs. However, estimation of efficiencies of SMEs using DEA is yet to be done in Bangladesh. In light of the Government’s industrial policy, Bangladesh Bank has undertaken various steps to provide financial assistance to small and medium enterprises. In order to do that, the existing commercial banks are expanding financial support to SMEs on a priority basis. Therefore, finding out of the efficiencies of the enterprises of this sector is very rationale for evolving this sector further through loans.

3. METHODOLOGY

3.1. Data and Variables

Data are considered as panel and taken from a field survey from the selected banks financing SMEs. Banks are selected on the basis of their contribution to total SME loans. Accordingly, 26 banks from conventional banks (CBs) and four Islamic banks (IBs) are included in this analysis. For estimating technical efficiencies, one output and some input variables of selected SMEs financed under banks are considered. In this paper we consider sales as an indicator of efficiency of SMEs which depends on capital, loans, expenditure and employment. The data are used for the period of 2009-2011. An output oriented intermediate approach DEA model has been used in this analysis. DEAP Version 2.1 (Coelli, 1996) has been used for these purposes.

3.2. Data Envelopment Analysis

Data Envelopment Analysis (DEA) a non-parametric mathematical programming approach to frontier estimation is mainly used for multiple-input and multiple-output production technologies.

Efficiency of Decision Making Unit (DMU) can be described as follows:

$$\text{Efficiency of DMU } j = \frac{u_1Y_{1j} + u_2Y_{2j} + \dots}{v_1X_{1j} + v_2X_{2j} + \dots} \tag{1}$$

- where, u_1 = the weight given to output 1
- x_{1j} = amount of input 1 to DMU_j
- v_1 = weight given to input 1
- y_{1j} = amount of output 1 from DMU_j and so on.

3.3. Constant return to scale model (CRS)

We consider there are K inputs and M outputs on each of N group of banks or DMUs. If i-th DMU's inputs and outputs represented by X_i and Y_i respectively, then X represents the input matrix of order KXN and Y represents the output matrix of order MXN. For each DMU, we want to obtain a measure of the ratio of all outputs over all inputs, such as $(u'y_i/v'x_i)$, where u is an MX1 vector of output weights and v is a KX1 vector of input weights.

To select optimal weights, we specify the mathematical programming problem. Charnes et al. (1978) summarized the problems and suggested that each DMU will be allowed to adopt a set of weights that will put the DMU in the best possible distinctive activity relative to all other DMUs in the sample.

$$\begin{aligned}
 & \text{Max } u, v \ (u'y_i/v'x_i) \\
 & \text{s.t. } (u'y_j/v'x_j) \leq 1, \ j=1, 2, \dots, \dots, N \\
 & \quad u, v \geq 0
 \end{aligned}
 \tag{2}$$

This involves finding values for u and v values in such a way that the efficiency measure of the i-th DMU is maximized, subject to the constraint that all efficiency measures must be less than or equal to one. One problem with this particular ratio formation is that it has an infinite number of solutions. To avoid this one can impose the constraint

$$\begin{aligned}
 & \text{Max } u, v \ (u'y_i), \\
 & \text{s.t. } v'x_i = 1 \\
 & \quad (u'y_j - v'x_j) \leq 1, \quad j=1, 2, \dots, \dots, N. \\
 & \quad u, v \geq 0
 \end{aligned}
 \tag{3}$$

According to Coelli (1998), using the duality in linear programming equivalent envelopment form of this problem can be written as:

$$\begin{aligned}
 & \text{Min } \theta \lambda \theta, \\
 & \text{s.t. } -y_i + Y\lambda \geq 0, \\
 & \quad \theta x_i - X\lambda \geq 0, \\
 & \quad \lambda \geq 0
 \end{aligned}
 \tag{4}$$

where, θ is a scalar and λ is a NXI vector of constants.

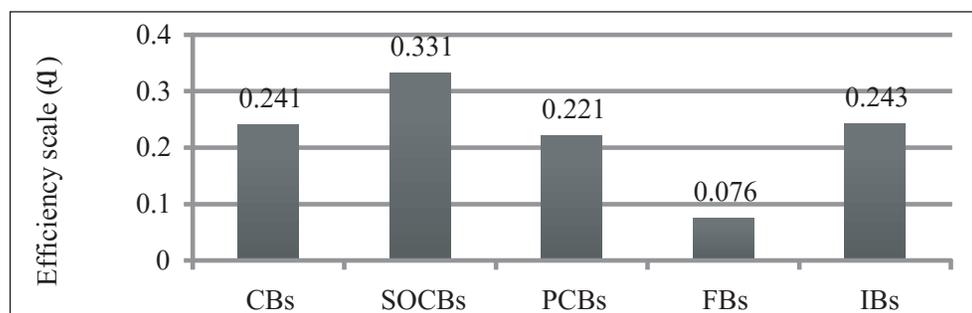
4. Findings

An analysis of the average technical efficiency of surveyed SMEs financed by different categories of banks was made using DEA— a method for measuring efficiency, benchmarking and continuous improvement of the enterprises, where sales data is used as output variable and capital, loans, total expenditure, employment data are used as input variables (Cooper et. al. 2002). The findings are categorized as follows.

4.1. Overall Technical Efficiencies of SMEs Financed under Types of Banks

It is found that almost the same technical efficiencies (constant return to scale) of SMEs between two types of bank financing—conventional and Islamic. 167 (59% of total) SMEs financed under 26 conventional banks (CBs) reveal average technical efficiency 0.241 (figure 4.1).

Figure 4.1 : Average Efficiency of SMEs Financed under Types of Banks



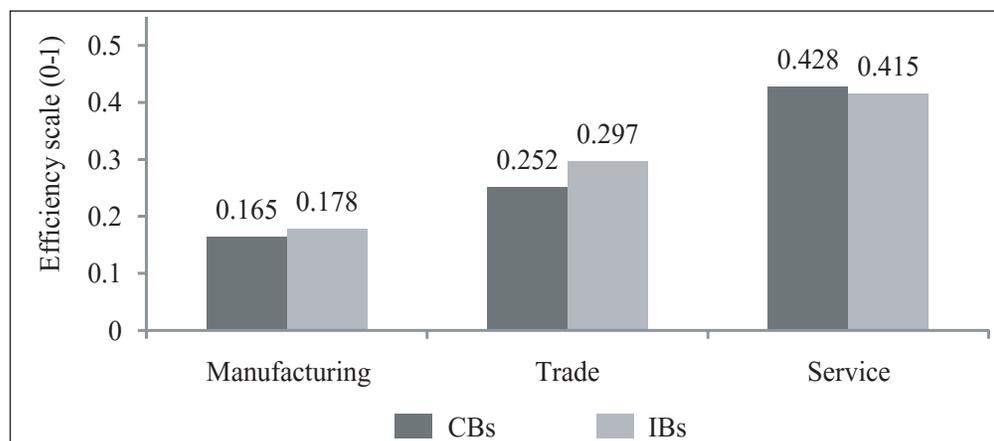
Conventional banks are segregated into state owned banks (SOCBs), private commercial banks (PCBs) and foreign banks (FBs). 42 (15% of total) SMEs financed under five SOCBs show average technical efficiency 0.331 due mainly to lower interest payment than other types of banks. 116 (41% of total) SMEs financed under 17 PCBs show average technical efficiency 0.221. Only nine (3% of total) SMEs taking loans from four FBs show lower average technical efficiency (0.076%) due mainly to higher interest payment accrued from finance through NGO linkage and indirect contact with the applicant SMEs. On the other hand, 116 (41% of total) SMEs financed under four Islamic banks reveal comparatively higher average technical efficiency 0.243 due to getting benefits from comparatively lower profit rate and no other hidden cost like service charge, insurance, stamp cost, etc.

4.2. Technical Efficiencies of Sector-wise SMEs financed under Types of Banks

The surveyed SMEs are classified into three sectors of the economy—manufacturing, trade and services. Most of SMEs are operating in trade sector (61%) followed by

manufacturing (35%) and service (4%) sectors. While analyzing the efficiency of sector-wise SMEs, it is found that efficiencies of 12 SMEs in the services sector are higher than those in other sectors (figure 4.2).

Figure 4.2 : Average Efficiency of Sector-based SMEs Financed under CBs and IBs

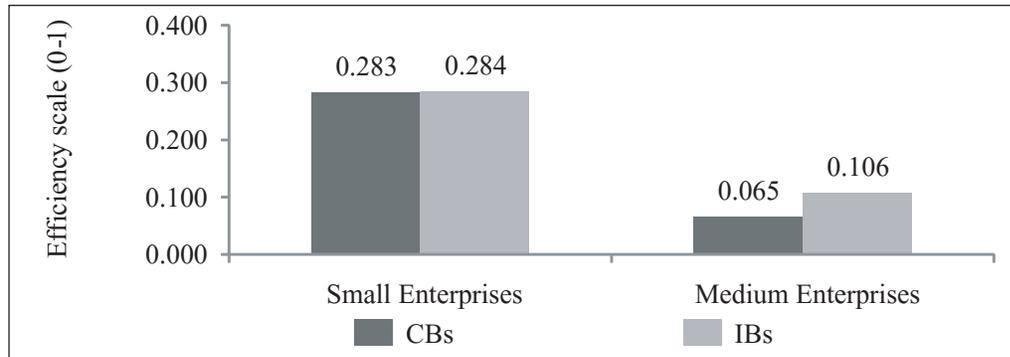


The average efficiency of SMEs in manufacturing, trade and services sector are 0.172, 0.268 and 0.427 respectively. 98 SMEs in the manufacturing sector show lower efficiencies due to unskilled labours, lack of infrastructural facilities, utilities shortages, etc. In consideration of SMEs financed under types of banks, it is found that efficiencies of SMEs in the manufacturing and trade sectors financed under IBs are better than those under CBs. The average efficiencies of SMEs in the manufacturing and trade sectors financed under IBs are 0.178 and 0.297 respectively compared with 0.165 and 0.252 respectively for those financed under CBs. In contrast, efficiencies of SMEs in the services sector financed under CBs are higher than those under IBs. The average efficiencies of SMEs in the services sector financed under CBs is 0.428 compared with 0.415 for those financed under IBs.

4.3. Technical Efficiencies of Size-wise SMEs financed by Types of Banks

The surveyed SMEs are classified into small and medium sized enterprises. Most of SMEs are small sized (79%) and the rest (21%) are medium sized. While analyzing the efficiency of size-wise SMEs, it is found that average efficiency of 224 small-sized enterprises is higher than those of 59 medium sized enterprises (figure 4.3).

Figure 4.3 : Average Efficiency of Size-based SMEs Financed under CBs and IBs

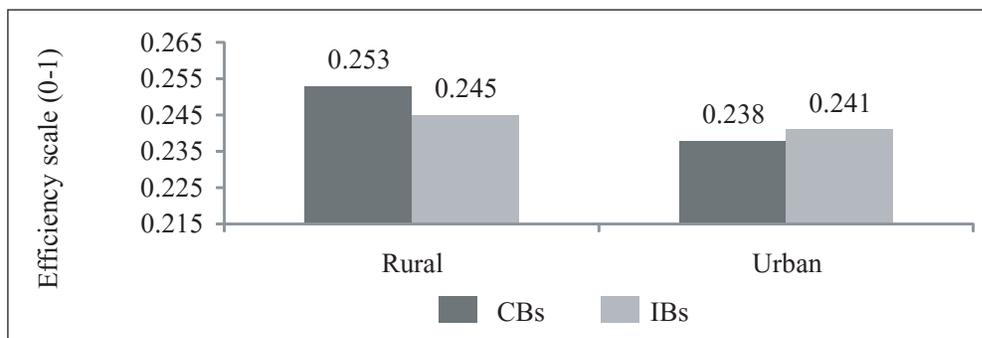


The average efficiencies of small-sized and medium sized enterprises are 0.283 and 0.084 respectively. In consideration of SMEs financed under types of banks, it is found that efficiencies of both sized enterprises financed under IBs are better than those under CBs. The average efficiencies of small-sized and medium sized enterprises financed under IBs are 0.284 and 0.106 respectively compared with 0.283 and 0.065 respectively for those financed under CBs.

4.4. Technical Efficiencies of Region-wise SMEs financed by Types of Banks

The surveyed SMEs are categorized into rural and urban enterprises. Most of SMEs are located in urban areas (73%) and the rest (27%) are in rural areas. While analyzing the efficiency of SMEs in the regional context, it is found that average efficiencies of 76 rural based SMEs is higher than those of 207 urban based SMEs due mainly to easy access to finance, skilled labors, utility facilities, better infrastructure, huge marketing, etc.(figure 4.4).

Figure 4.4 : Average Efficiency of Region-based SMEs Financed CBs and IBs



The average efficiencies of SMEs located in rural and urban areas are 0.249 and 0.239 respectively. In consideration of SMEs financed under types of banks, it is found that average efficiency of urban SMEs financed under IBs are better than those financed under CBs. The average efficiency of urban SMEs financed under IBs is 0.241 compared with 0.238 for those financed under CBs. In contrast, average efficiency of rural SMEs financed under CBs are better than those financed under IBs. The average efficiency of rural SMEs financed under CBs is 0.253 compared with 0.245 for those financed under IBs. Since SOCBs finance SMEs in the rural areas with their huge network of branches and provide low cost loans to SMEs, the efficiencies of SMEs under CBs thus seem to be higher.⁵

5. CONCLUSION

Empirical findings show that efficiencies of SMEs financed under different banks differ from bank to bank. However, the paper followed a division of SMEs financed under two types of banks— conventional and Islamic. The results show that there are no significant differences in efficiencies of SMEs financed under conventional and Islamic banks. But a slight difference of efficiencies of SMEs is observed while considering the size, sector and region where they are running businesses. The efficiencies of SMEs in the manufacturing and trade sectors financed under Islamic banks are somewhat greater compared to the conventional banks because Islamic banks follow proper utilization and strict supervision policies in disbursing loans to the borrowers. On the other hand, efficiencies of SMEs in the services sector financed by conventional banks are somewhat greater compared to the Islamic banks. In case of efficiencies of both sized enterprises financed under Islamic banks are better than those financed under conventional banks. While further comparing regional differences of efficiencies of SMEs financed under two types of banks, the efficiencies of rural SMEs financed by conventional banks is greater than those financed under Islamic banks. On the other hand, the efficiency of urban SMEs financed by Islamic banks is higher than those financed under conventional banks.

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