Efficiency of Modaraba and Leasing Companies in Pakistan

Muhammad Jam-e-Kausar Ali Asghar and Talat Afza

COMSATS Institute of Information Technology, Lahore, Pakistan
Head of Academics, CIIT, Lahore, Pakistan

Abstract: The study has estimated the profit efficiency, technical efficiency and cost efficiency of modaraba and leasing companies in Pakistan over the period of 2005 to 2010 with the help of parametric Stochastic Frontier Approach (SFA). The input and output variables were selected by following the value added approach. The results revealed that leasing companies are 86.4% profit efficient, 86.5% technical efficient and 89% cost efficient whereas, modaraba companies are 87.2% profit efficient, 51.2% technical efficient and 96.1% cost efficient. Moreover, the study also found that the financial crisis in 2009 has negatively affected the profit efficiency of leasing firm whereas, the study do not find any drop in the efficiency trend of modaraba companies.

Key words: Profit Efficiency · Technical Efficiency · Cost Efficiency · Modarabas · Leasing Companies
Stochastic Frontier Approach · Pakistan

INTRODUCTION

Financial Institutions are becoming crucial in today’s competitive and uncertain economic environment. The financial institutions basically pump the idle funds in various productive channels of the economy. Therefore, it is important for every country to have efficient financial institutions for continuous growth. Financial institutions can improve their efficiency with the production of high outputs or by reducing their input costs. There are various types of efficiency concepts which explain a range of dimensions such as; technical efficiency determines the ability of financial institutions to maximize their outputs with the utilization of lower inputs. Profit efficiency examines that how profitable a firm to its rivals whereas, the cost efficiency determines, how close a firm’s cost to a best performer’s cost.

Leasing and Modaraba companies as financial institutions are also contributing in the economic development of Pakistan as like the other financial institutions. On one hand, Leasing companies by providing the heavy machinery on lease facilitate the small businesses to save their funds since small businesses mostly have constraints on their financial resources. Moreover, small businesses also enjoy various financial benefits associated with the lease finance such as; they charge periodic payments on the use of a specific fixed asset which are allowed to subtract from the taxable profits of the business firm. In a developing country like Pakistan, it is highly essential to have an efficient leasing sector to support the businesses in the country. On other hand, modarabas provide various Islamic products but within the limits of Sharia law such as; Musharika, Modaraba, Murabaha and leasing activities etc. Hassan and Usman [1] also suggest that Sharia based financial institutions have massive growth opportunities. In Pakistan, leasing and modaraba firms are providing medium to long term financing facilities and contributing a lot towards the development of the financial sector in Pakistan.

The first leasing company “National Development Leasing Corporation” (NDLC) was incorporated in 1984. Now, there are 23 leasing companies which are contributing in the development of the country. The members of the leasing association of Pakistan have the total assets of 136 billion rupees (Leasing Association of Pakistan (LAP), 2009). Moreover, the total investments in lease finance are 71.6 billion rupees (LAP, 2009). Interestingly, it is also notable that the leasing operations are concentrated towards the top four leasing firms.
As like leasing sector, Modaraba companies are operating in Pakistan from last 30 years as the modaraba governing laws were introduced in 1980. There are currently 26 modaraba companies operating in Pakistan with the total equity capital of 11.49 billion rupees and total assets of 26.76 billion rupees (Economic Survey, 2012). Nevertheless, modarabas are established as a well understood Sharia compliance instrument of financing in Pakistan which is also accepted by many Islamic scholars. Surprisingly, the progress of the modarabas is highly disappointing since the total deposits under their management are just 2.7 billion rupees and the total market capitalization of the modaraba companies is also very small (Economic Survey, 2011). On the positive note, as the overall financial institutions have financial problems in recent years but still 17 of the modaraba companies have declared cash dividends in 2010 (Economic Survey, 2011).

Financial year 2009 turn out to be a nightmare for the financial institutions of Pakistan. The rising oil prices along with inflation allowed the regulators to lift all kind of interest rates into double figures. Moreover, the political and economic uncertainties eventually add more pressure on the economy which eventually affected the financial institutions along with the largest Karachi Stock Exchange (KSE) which fall from 15737 index points to 9144 index points over a short period of four months in the same financial year. Therefore, present study has also tried to evaluate the affect of this financial crisis on the efficiency scores of leasing and modaraba industry in Pakistan.

The study of efficiency in the leasing and modaraba companies is of significance importance since it will contribute in the existing literature by following ways. Firstly, Manager can identify the cause of their lower efficiency since different kind of efficiencies communicate diverse dynamic of the firm. Secondly, this study will also help the regulators to understand the strengths of the overall industry along with the impact of their time to time implemented reforms. Finally, current study will also help the investors to rank the firms based on their efficiency scores. Moreover, this study will also try to examine the effect of financial crisis in 2009 on the efficiency scores of leasing and modaraba companies in Pakistan which will help all of the stakeholders.

The remaining paper is organized as follows; section II will discuss some of the empirical studies on the efficiency and performance of financial institutions in Pakistan. Section III will express the methodology of the study applied to compute the efficiency scores whereas, section IV will reveal the results of the study in brief and the paper will end with some concluding remarks in the section V.

**Literature Review:** In the empirical literature, there are studies which have investigated the efficiency of financial institutions in Pakistan. For instance; some studies have examined the efficiency of commercial banks [2-14], others have analyzed the efficiency of insurance companies [15-18] and some other have examined the efficiency of mutual funds in Pakistan [19, 20]. But as like the other financial institutions, we failed to find any significant study which has evaluated the efficiency of leasing and modaraba companies in Pakistan.

Leasing companies not exist in most of the countries since the commercial banks mostly do the leasing activities. Therefore, there are a few studies in empirical literature which have analyzed the efficiency of leasing firms with the frontier methods. We found a single study by Marta [21] which applied SFA and analyzed the efficiency of Italian leasing firms. Input variables were labour, other operating expenses and interest expense whereas, leasing loans was used as the sole output variable. The study found 74% cost efficiency in the leasing firms of Italy over the period of 2002 to 2006.

In Pakistan, some studies which have tried to analyze the performance of leasing companies with various financial ratios. For instance; Alam et al. [22] analyzed the performance of 18 leasing companies in Pakistan over the period 2006 to 2009. This study computed, profitability ratios, payout ratios, leverage ratios and liquidity ratios to access the performance of leasing firms. The results indicated in the year 2007 and 2009 whereas, in the year 2006 and 2008 the performance level was increased.

As like the leasing companies, we failed to find any significant study in empirical literature which had investigated the efficiency of the modaraba companies with parametric or non parametric approaches. There are studies which have analyzed the performance of modarabas with traditional methods. As, Khan [23] investigated the performance of modaraba companies in Pakistan over the period of 1991 to 1994. This study used Sharpe and Treynor Indices for Modaraba companies, leasing companies and Banks. The results suggested that after the initial success the modaraba companies failed to reward risk and increase the wealth of investors as compared to banks. Moreover, their performance is also found lower than the average KSE returns. Another study by Rehman et al. [24] analyzed the intellectual capital performance and its impact on the corporate performance.
of 12 modaraba companies in Pakistan. This study examined the performance of human capital efficiency, structural capital efficiency and capital employed efficiency and its impact on the overall performance of the corporation. The results suggested that higher investment in the human capital can result in higher financial performance of the modaraba companies. Moreover, structural capital efficiency and capital employed efficiency also playing considerable part in the financial performance of the modaraba companies. There is no study in empirical literature to the best of author’s knowledge which have examined their efficiency of leasing and modaraba companies in Pakistan.

MATERIALS AND METHODS

Empirical studies have investigated the efficiency of financial institutions with the parametric [Stochastic Frontier Approach (SFA), Distribution Free Approach (DFA) and Thick Frontier Approach (TFA)] and non-parametric [Data Envelopment Analysis (DEA) and Free Disposal (FDH)] approaches. Both these approaches have their drawbacks and benefits. Current study has followed the SFA approach for computation of efficiency scores in the modaraba and leasing companies of Pakistan. The remaining parametric approaches DFA and TFA do not fulfill our analysis requirement since DFA have problems with the inefficiency component of the error term for the period of six years whereas, TFA do not provide firm wise efficiency scores. The non-parametric approaches are not included since DEA has less structural assumption such as; it do not include the error term into the model whereas, FDH raises the biasness issue since it relaxes the convexity assumption. SFA is a parametric approach which assumes that the deviation from the frontier is composed of two parts; one represents statistical noise and the other represents inefficiency. It is also assumed that the inefficiency follows an asymmetric half normal distribution whereas, the statistical noise follows a normal distribution. These assumptions are due to the fact that the inefficiencies cannot be negative. This kind of logic has primarily led researchers towards the development of the Stochastic Frontier Approach (SFA).

SFA is one of the popular techniques for measuring the level of efficiency in the financial institutions which was independently formulated by Aigner et al. [25], Battese and Corra [26] and Meeusen and Van den Broeck [27]. As discussed earlier, the basic theme behind its formulation is an idea that deviation from the efficient frontier may not be just because of inefficiency. SFA allows the error term in the function form which is segregated into two parts; the statistical noise and the inefficiency. The parameters and the combined error terms of the SFA model is obtained from the maximum likelihood estimation and various studies have preferred this method [28]. The observation specific computation of efficiency scores can be obtained by selecting the distribution of the inefficiency term conditional on the estimation of all composed error terms. This study will compute profit efficiency, technical efficiency and cost efficiency with the help of the SFA technique.

Cost and Profit Efficiency: The cost function of SFA describes the minimization of input at a given level of output. Any deviation from the minimum possible input level is considered as inefficiency. The SFA’s cost frontier is based on an equation which relates a firm’s cost to various variables that incur those costs, such as output levels and input prices along with the inefficiency and random error. The following equation can describe the real relationship as;

\[ TC = f(y, w, z) + u + v \]  

where TC is the total cost of the firm; y is a vector of output variables, w is a vector of input price variables, z is the vector for various firm parameters which can influence the efficiency, u is the inefficiency term which captures the difference between efficient level of cost for given level of output and input prices and the actual level of cost and v is the random error term. The same equation can be written in a natural log form as;

\[ \ln(TC) = f(y, w, z) + \ln(u) + \ln(v) \]  

\[ \ln(TC) \] by following the translog function can be written as;

\[ \ln(TC) = \alpha_0 + \sum \beta_i \ln(y_i) + \sum \ln(w_i) + 0.5 \sum \ln(y_i) \ln(y_i) + 0.5 \sum \ln(w_i) \ln(w_i) \]  

\[ + v_i + u_i \]  

where TC is the total cost, yi is the ith output, wi is the input price, vi is the random error and ui is the inefficiency as described earlier. It is required by the duality theorem that the translog function must be linearly homogeneous in input prices and continuity requires that the second order parameters must be symmetric [29]. In other words, linear homogeneity of degree 1 is required. Therefore, this
study has chosen one input price and divides it with all other input prices and also with the dependent variable before taking their natural logs. We have also included z into the model in account for the variable which can affect the structure of the frontier [30]. We have selected size as which is measured as the total asset of the firm by following Sun and Chen, [31] Baten and Anton, [32]. Moreover, to accommodate technological change over time, t is also included which represents time factor [33]. The same model was also followed by Bos and Kool [34]. Now, the final model to compute the cost efficiency will be;

\[
\ln TC_{it} = \alpha_t + \Sigma \beta_i \ln y_{it} + \Sigma \gamma_i \ln w_{it} + 0.5 \Sigma \delta_i \ln y_{it} + 0.5 \Sigma \epsilon_i \ln z_{it} + 0.5 \Sigma \zeta_i \ln x_{it} + \Omega_t + 0.5 t^2 + \epsilon_i \ln w_{it} + \alpha_t + \Phi \ln z_{it} + v_i + u_i
\]

(3.4)

According to Berger and Mester [35], “profit maximization is superior to cost minimization for most purposes because it is the more accepted economic goal of firm’s owners, who takes revenues as well as costs into account when making decisions”. All the explanatory variables remain the same as in the cost function in figure 3.5, the dependent variable replace total cost with total profit and the inefficiency term (ui) is subtracted instead of addition from the random error term (vi) due to the production nature of the function. As the translog function does not include the negative profits since we have to take the natural log of the figures, we have added the lowest profit (Biggest loss) into the profits of all firms and then add 1 by following various studies [36]. In other words, we can describe the dependent variable for profit function as \( \ln(\pi+k+1)_{it} = \alpha_t + \Sigma \beta_i \ln y_{it} + \Sigma \gamma_i \ln w_{it} + 0.5 \Sigma \delta_i \ln y_{it} + 0.5 \Sigma \epsilon_i \ln z_{it} + 0.5 \Sigma \zeta_i \ln x_{it} + \Omega_t + 0.5 t^2 + \epsilon \ln w_{it} + \alpha_t + \Phi \ln z_{it} + v_i - u_i \)

(3.5)

**Technical Efficiency:** Technical efficiency measures the ability of the firm to maximize its outputs with the utilization of lower inputs. Current study has selected translog distance function for the computation of the technical efficiency. The translog function is selected since it is widely accepted in SFA application whereas, distance function is used to accommodate multiple inputs and multiple outputs. Eling and Luhnen [33] and Ogundari and Brummer [37] also used the translog distance function for the computation of technical efficiency. There are two types of distance functions; the input distance oriented function and output distance oriented function. The input distance function assumes that firms mainly focuses on reducing inputs to produce fixed outputs whereas, contrary to this, output distance function assumes that firms mainly focuses on raising outputs with the utilization of fixed inputs.

We will follow the input distance function to compute the technical efficiency of FIs since reduction of inputs has more importance than the maximization of outputs. The function is provided as follows;

\[
\ln x_{it} = \alpha_t - \Sigma \beta_i \ln y_{it} - \Sigma \gamma_i \ln w_{it} - 0.5 \Sigma \delta_i \ln y_{it} - 0.5 \Sigma \epsilon_i \ln z_{it} - 0.5 \Sigma \zeta_i \ln x_{it} - 0.5 \Sigma \sigma_i \ln y_{it} - 0.5 \Sigma \chi_i \ln z_{it} - 0.5 \Sigma \omega_i \ln x_{it} - \Omega t - 0.5 t^2 - \epsilon \ln w_{it} + \alpha_t - \Phi \ln z_{it} - v_i - u_i
\]

where \( X_{it} \) are the k inputs of financial institution i at time t, \( X_{ki} \) is the input which is divided by other inputs and is also the dependent variable by following the distance function specifications. The other specifications and variables are the same as discussed earlier in case of profit efficiency since it is a production function.

**Input, Input Prices and Output:** There were a few empirical studies in literature which have investigated the efficiency of leasing and modaraba companies with frontier techniques. Therefore, it is really hard to propose the input and outputs for leasing and modaraba companies. We followed the value added approach for the selection of input and output variables instead of intermediation or user cost approach. Current study has selected two outputs for the leasing and modaraba companies which are; Investments and Income revenue. Leasing companies invest their funds into lease finance investments whereas, modaraba companies invest their funds in Sharia compliance investments. Investments have very significant importance for both the sectors and they allocate their more than 45 percent of their funds as investments. As one of the primary motives of business is to earn, therefore, current study have selected the total income as the other output for both these sectors. For leasing companies it is measured as investment income plus lease finance income whereas, for modaraba companies it is measured as total income from various Sharia compliance investments.
Table 1: Variables for Stochastic Frontier Approach

| Outputs                                      | Inputs                   | Input Prices                        |
|----------------------------------------------|--------------------------|-------------------------------------|
| Investments and Lease Finance Income (Only for Leasing Companies) | Labour and Business Services | Total Operating Expenses / Total Assets (%) |
| Total Income from Sharia Compliance (Only for Modarabas)                     | Equity                   | 5 year average stock rate of return (%) |
| Investments                                    | Debt                     | 12 month T bill rate (%)            |

Table 2: Descriptive Statistics: Leasing Companies in Pakistan (2005 to 2010)

| Year | Obs | Lease and Investment Income | Investment in Lease Finance | Labour and Business Services | Price of L & BS | Equity | Price of Equity | Debt | Price of Debt | Total Cost | Total Profit |
|------|-----|-----------------------------|------------------------------|------------------------------|-----------------|-------|----------------|------|--------------|------------|--------------|
| 2005 | 22  | Mean 314.00                 | 1537.52                      | 129.81                       | 5.720           | 530.70| 34.670           | 2502.25| 8.076        | 249.93     | 72.49        |
|      | SD  | 1911.43                     | 220.10                       | 220.96                       | 7.961           | 0.00  | 3377.902         | 0.00  | 0.00         | 247.54     | 37.80        |
| 2006 | 22  | Mean 395.57                 | 1870.52                      | 149.09                       | 5.971           | 641.64| 35.295           | 3229.64| 8.882        | 369.23     | 68.23        |
|      | SD  | 442.52                      | 2686.11                      | 239.25                       | 8.316           | 568.30| 0.00             | 4718.25| 0.00         | 447.54     | 117.90       |
| 2007 | 21  | Mean 458.65                 | 2038.59                      | 568.34                       | 17.352          | 707.98| 43.093           | 3484.70| 9.215        | 839.73     | 23.53        |
|      | SD  | 573.50                      | 3115.08                      | 1778.25                      | 48.595          | 690.73| 0.00             | 5341.64| 0.00         | 1836.27    | 169.25       |
| 2008 | 20  | Mean 525.17                 | 2110.55                      | 201.75                       | 6.980           | 776.80| 43.831           | 3712.76| 10.840       | 497.57     | 55.30        |
|      | SD  | 735.98                      | 3058.92                      | 346.04                       | 9.979           | 788.58| 0.00             | 5834.09| 0.00         | 703.64     | 105.61       |
| 2009 | 15  | Mean 569.42                 | 1570.21                      | 253.54                       | 9.917           | 697.98| 28.794           | 3380.20| 12.632       | 635.97     | -186.27      |
|      | SD  | 833.81                      | 2390.03                      | 414.64                       | 14.492          | 712.86| 0.00             | 6343.76| 0.00         | 928.63     | 322.63       |
| 2010 | 15  | Mean 411.90                 | 1321.08                      | 219.77                       | 8.830           | 681.47| 11.147           | 2954.47| 12.643       | 511.96     | 90.15        |
|      | SD  | 609.87                      | 2335.94                      | 358.96                       | 12.450          | 789.13| 0.00             | 5610.50| 0.00         | 796.16     | 290.11       |
| Average | 115 | Mean 438.83                | 1768.42                      | 253.96                       | 9.064           | 668.58| 34.086           | 3204.83| 10.109       | 508.05     | 4.78         |
|      | SD  | 589.36                      | 2584.95                      | 808.92                       | 22.722          | 651.26| 10.241           | 5065.69| 1.735        | 974.20     | 202.72       |

This study has selected three inputs to compute the efficiency of leasing and modaraba sector; labour & business services, equity capital and debt capital. Labour & business services expense is measured as the total operating expenses incurred by these companies which is actually the total operating cost. Equity capital is measured as the total equity including reserves whereas, debt capital is measured as the total debt borrowed by the firm. The input prices are measured as; Labour & business services to total assets for labour & business services, 5 year average stock rate of return for equity and 12 month T bill rate for debt capital. The total cost is measured as total financial and operating cost incurred by leasing and modaraba companies. In view of the fact that both leasing and modaraba companies are different in their nature of operations. Therefore, we will compute the DEA efficiency scores for both industries separately. Outputs, inputs and input prices are briefly provided in Table 1.

**Data:** The descriptive statistics of the leasing companies are provided in Table 2. Current study has analyzed the 22 leasing (including 6 modarabas which are operating as a leasing company since they were the member of the leasing association of Pakistan or their total leasing assets consists of more than 50% of its total assets in any of the year of the study) and 24 modaraba companies operating in Pakistan over the period of 2005 to 2010. The data is collected from their annual published reports and also from NBFI and Modaraba Association of Pakistan. The mean and standard deviation of outputs, inputs and input prices which are used to measure the efficiency of
Table 3: Descriptive Statistics: Modarabas in Pakistan (2005 to 2010)

| Year | Obs | Total Income | Investments | Labour and Business Services | Price of L & BS | Equity | Price of Equity | Debt | Price of Debt | Total Cost | Total Profit |
|------|-----|--------------|-------------|-------------------------------|----------------|-------|----------------|-----|---------------|------------|--------------|
| 2005 | 23  | 154.75       | 672.25      | 98.48                         | 8.80           | 342.35| 34.67          | 452.03| 8.08          | 119.59     | 30.42        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 242.33       | 850.38      | 195.12                        | 8.30           | 309.75| 0.00           | 628.40| 0.00          | 212.97     | 31.89        |
| 2006 | 20  | 201.82       | 758.18      | 123.32                        | 9.11           | 375.61| 35.29          | 615.34| 8.88          | 156.90     | 32.04        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 280.33       | 1052.80     | 242.33                        | 8.67           | 417.60| 0.00           | 818.10| 0.00          | 269.96     | 33.85        |
| 2007 | 21  | 227.26       | 899.04      | 131.35                        | 8.66           | 457.00| 43.09          | 689.76| 9.22          | 185.72     | 30.56        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 390.14       | 1303.76     | 288.20                        | 8.31           | 593.82| 0.00           | 1048.39| 0.00          | 342.37     | 46.86        |
| 2008 | 24  | 252.96       | 858.73      | 116.13                        | 9.41           | 480.94| 43.83          | 706.11| 10.84         | 171.05     | 41.58        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 420.54       | 1270.01     | 293.66                        | 10.29          | 628.84| 0.00           | 1100.61| 0.00          | 329.97     | 63.06        |
| 2009 | 22  | 275.32       | 569.11      | 130.43                        | 11.80          | 461.41| 28.79          | 540.70| 12.63         | 194.32     | -5.02        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 437.32       | 837.18      | 312.24                        | 13.19          | 547.76| 0.00           | 911.25| 0.00          | 338.24     | 134.25       |
| 2010 | 23  | 258.13       | 622.25      | 120.26                        | 11.84          | 470.54| 11.15          | 541.14| 12.64         | 174.03     | 33.35        |
|      |     | Mean         | Mean        | Mean                          | Mean           | Mean  | Mean           | Mean | Mean          | Mean       | Mean         |
|      | SD  | 381.00       | 966.15      | 252.80                        | 12.35          | 596.79| 0.00           | 911.70| 0.00          | 274.79     | 86.85        |
| Average | 133 | 228.82       | 728.92      | 103.53                        | 9.96           | 432.33| 32.71          | 590.05| 10.42         | 151.77     | 27.35        |
|      | SD  | 365.67       | 1048.96     | 248.27                        | 10.30          | 522.81| 11.18          | 904.80| 1.80          | 279.14     | 75.56        |

Total Firms: 24

Total Income: Total Sharia Compliance Income
Investment: Total Investments
Labour & Business Services: Total Operating Expenses
Price of L & BS: Total Operating Expenses / Total Assets (%)
Equity: Total Equity
Price of Equity: 5-Year-Average KSE rate of return (%)
Debt: Total Debt
Price of Debt: 12 month T. bill rate (%)
Total Cost: Management + Financial + Operating Expenses
Total Profit: Total profit before tax

22 leasing firms are given in the Table 3.2. Its indicates that both outputs; lease and investment income and lease investments are gradually improved over the study period from 314 million and 1538 million rupees in 2005 to 525 million and 2111 million rupees in 2008. As like other financial institutions the year 2009 do not depicts a favorable picture since both outputs are sharply fall, thereafter.

As like the outputs, input cost labour and business also shown similar trend over the study period which implies that leasing companies rationally control their operational costs. The equity capital is not significantly increased since the regulatory bodies did not impose any regulations to improve the minimum share capital of the leasing companies. Debt capital is increased from 2502 million in 2005 to 3713 million rupees in 2008 and then fall after word. It indicates that year 2009 reduced the business of the leasing companies as like the other financial institutions which ultimately reduced the debt and equity capital of the leasing firms in Pakistan.

The descriptive statistics of the modarabas are given in the Table 3. There are 24 modaraba companies operating in Pakistan, the descriptive statistics of these Modarabas are provided in Table 3.3. Although, the total income of the Modarabas is improved over the study period from 155 million to 258 million rupees but as like other financial institutions the total investments of the Modarabas fall in 2009 from 859 million in 2007 to 570 million rupees in 2008 due to financial uncertainty within the country. Labour and business services and its price is also increased over the study period but this raise is minor if we compare it with other financial institutions which indicates that new labour is not as much hired by the modaraba companies as compared to other financial institutions of Pakistan.

Equity capital is also raised over the study period but this increase is minor since there are no regulatory policies in case of modarabas as like leasing companies to raise their minimum share capital. Total debt is raised over the period of 2005 to 2008 and then fall as like the leasing sector of Pakistan due to lower growth in Modaraba business. The mean profitability of the modarabas in the year 2009 is negative (~5 million rupees) which also validates that the economic uncertainties has negatively affected the performance of the modarabas in Pakistan. Total cost of the modarabas has a mixed trend over the study period.
RESULTS

The profit efficiency, technical efficiency and cost efficiency results of the leasing and modarabas are given in Table 4 and 5, respectively. Leasing industry results reveals that the profit efficiency in the leasing companies of Pakistan is 86.2% over the study period of 2005 to 2010. It suggests that the leasing companies can achieve same level of profitability with the consumption of 13.8% less inputs. The highest profit efficiency is found in First Habib Modaraba (95.5%) and Pak Gulf Leasing (95.1%) companies over the study period of 2005 to 2010. The lowest profit efficiency is found in trust investment bank (67.9%) which reveals that the company is failed to optimally utilize its resources to compete and to earn positive profits as a leasing. This firm shown worst results in the year 2009 and 2010 which can be due to the affect of financial crisis.

The leasing companies have the mean cost efficiency of 89% which revealed that the leasing companies are 11% cost inefficient. The highest cost efficiency is found in the Askari Leasing (92.8%), Pak Gulf Leasing (94.3%) and BRR International Modaraba (93.4%). It indicates that these firms are optimally utilizing their resources to produce their outputs with the minimum usage of cost as compared to its rivals. The lowest cost efficiency is found in Grays Leasing (69.8%) and Network Leasing (83.1). This companies need to improve its efficiency level with the production of higher outputs with the consumption of lower input prices.

The technical efficiency is found 86.5% in the leasing companies of Pakistan. It implies that the leasing firms can achieve same level of output with the utilization of 13.5% lower inputs. The highest technical efficiency is found in the Askari Leasing (92.8%), Pak Gulf Leasing (94.3%) and BRR International Modaraba (93.4%). It indicates that these firms are optimally utilizing their resources to produce their outputs with the minimum usage of cost as compared to its rivals. The lowest cost efficiency is found in Grays Leasing (69.8%) and Network Leasing (83.1). This companies need to improve its efficiency level with the production of higher outputs with the consumption of lower input prices.

The technical efficiency is found 86.5% in the leasing companies of Pakistan. It implies that the leasing firms can achieve same level of output with the utilization of 13.5% lower inputs. The highest technical efficiency is found in the Askari Leasing (92.8%), Pak Gulf Leasing (94.3%) and BRR International Modaraba (93.4%). It indicates that these firms are optimally utilizing their resources to produce their outputs with the minimum usage of cost as compared to its rivals. The lowest cost efficiency is found in Grays Leasing (69.8%) and Network Leasing (83.1). This companies need to improve its efficiency level with the production of higher outputs with the consumption of lower input prices.

Profit efficiency in the modaraba companies of Pakistan is found 87.2% which suggest that modaraba industry can produce same level of profits with the

### Table 4: Average efficiency of leasing Companies in Pakistan (2005 to 2010)

| Modaraba Company Name | PE   | TE   | CE   |
|-----------------------|------|------|------|
| Al-Zamin Leasing Corporation | 0.892 | 0.938 | 0.916 |
| Al-Zamin Leasing Modaraba | 0.839 | 0.907 | 0.904 |
| Askari Leasing | 0.851 | 0.927 | 0.928 |
| Capital Assets Leasing | 0.865 | 0.786 | 0.875 |
| First Fidelity Leasing Modaraba | 0.880 | 0.771 | 0.922 |
| First Habib Bank Modaraba | 0.880 | 0.842 | 0.916 |
| First Habib Modaraba | 0.955 | 0.916 | 0.891 |
| Grays Leasing | 0.833 | 0.926 | 0.698 |
| International Multi Leasing | 0.924 | 0.812 | 0.919 |
| Network Leasing | 0.839 | 0.858 | 0.831 |
| Orix Leasing Pakistan | 0.901 | 0.948 | 0.904 |
| Pak Gulf Leasing | 0.951 | 0.937 | 0.943 |
| Pak. Indust. & Comm. Leasing | 0.946 | 0.549 | 0.902 |
| Security Leasing Corporation | 0.803 | 0.914 | 0.886 |
| Sigma Leasing Corporation | 0.928 | 0.915 | 0.864 |
| SME Leasing | 0.898 | 0.940 | 0.924 |
| Standard Chartered Leasing | 0.776 | 0.900 | 0.861 |
| Standard Chartered Modaraba | 0.907 | 0.940 | 0.899 |
| Trust Investment Bank | 0.679 | 0.952 | 0.903 |
| Natover Lease | 0.912 | 0.674 | 0.870 |
| BRR Int./Guard Modaraba | 0.784 | 0.756 | 0.934 |
| Mean | 0.864 | 0.865 | 0.890 |
| Minimum | 0.679 | 0.549 | 0.698 |

### Table 5: Average efficiency of Modarabas in Pakistan (2005 to 2010)

| Modaraba Company Name | PE   | TE   | CE   |
|-----------------------|------|------|------|
| Al Zamin Leasing Modaraba | 0.738 | 0.763 | 0.928 |
| Allied Rental Modaraba | 0.927 | 0.577 | 0.971 |
| B.F.Modaraba | 0.916 | 0.527 | 0.962 |
| BRR Int./Guard Modaraba | 0.652 | 0.829 | 0.959 |
| Crescent Standard Modaraba | 0.966 | 0.368 | 0.969 |
| First Al Noor Modaraba | 0.943 | 0.331 | 0.967 |
| First Constellation Modaraba | 0.898 | 0.301 | 0.968 |
| First Elite Capital Modaraba | 0.914 | 0.412 | 0.963 |
| First Equity Modaraba | 0.904 | 0.497 | 0.959 |
| First Fidelity Leasing Modaraba | 0.914 | 0.456 | 0.959 |
| First Habib Bank Modaraba | 0.909 | 0.449 | 0.960 |
| First Habib Modaraba | 0.903 | 0.467 | 0.963 |
| First IBL Modaraba | 0.880 | 0.598 | 0.966 |
| First Imroz Modaraba | 0.895 | 0.620 | 0.962 |
| First KASK/Mehran Modaraba | 0.903 | 0.468 | 0.961 |
| First National Bank Modaraba | 0.775 | 0.437 | 0.956 |
| First Pak Modaraba | 0.911 | 0.341 | 0.971 |
| First Paramount Modaraba | 0.913 | 0.429 | 0.959 |
| First prudential Modaraba | 0.908 | 0.652 | 0.956 |
| First Punjab Modaraba | 0.635 | 0.600 | 0.959 |
| First UDL Modaraba | 0.895 | 0.499 | 0.959 |
| Modaraba Al Mali | 0.900 | 0.653 | 0.963 |
| Standard Chartered Modaraba | 0.838 | 0.496 | 0.952 |
| Trust Modaraba | 0.887 | 0.514 | 0.972 |
| Mean | 0.872 | 0.512 | 0.961 |
| Maximum | 0.966 | 0.829 | 0.972 |
| Minimum | 0.635 | 0.301 | 0.928 |
utilization of 12.8% lower inputs to produce their outputs. The highest profit efficiency is found in Crescent Standard Modaraba, First Al Noor Modaraba and Allied Rental Modaraba with the efficiency score of 96.6%, 94.3% and 92.7%, respectively. These three companies were also found high profitable in most of their respective years of analysis which indicates that they are optimally utilizing their resources. The lowest profit efficiency is found in First Punjab and BRR International Modaraba with the efficiency scores of 63.5% and 65.2%, respectively. Both these modarabas have lower profit efficiency due to their worst financial results especially in the recent years (2008 and 2009).

The cost efficiency in the modaraba companies of Pakistan is found 96.1% over the study period of 2005 to 2010. It indicates that the modaraba companies are only wasting 3.9% of their input to produce their outputs. The highest cost efficiency is found in the Trust modaraba, First Pak modaraba and Allied rental modaraba companies with the efficiency scores of 97.2%, 97.1% and 97.1%. It suggests that these two modarabas produce maximum output with the consumption of lowest inputs. The lowest cost efficiency is found in Al Zamin leasing modaraba which suggests that the company failed to minimize its cost to produce its outputs.

Modaraba companies are found 51.2% technical efficient which reveals that the modarabas can produce same level of outputs with the utilization of 48.8% lower inputs. It implies that the modaraba companies in Pakistan have lower technical efficiency. Therefore, the modaraba companies need to take serious measure to improve it. The highest technical efficiency is found in BRR International Modaraba and Al Zamin Leasing Modaraba which suggest that both these companies are performing better than its competitors. Al Zamin Leasing Modaraba was actually the high technical efficient but still it do not able to minimize its cost. Therefore, it really need to improve its overall production to improve its technical efficiency. The lowest technical efficiency is found in First Constellation Modaraba and First Al Noor Modaraba. Although, First Al Noor Modaraba was one of the most profit efficient modaraba but still it is found lowest technical efficient which indicates that higher profitability do not validates that a firm is performing well.

The efficiency trend of the leasing companies over the study period is provided in the Figure 4.1. It reveals that the technical efficiency and cost efficiency of the leasing companies have lower variation. Technical efficiency is slightly raised over the study period which suggests that the leasing industry have improve its operation which raised their operational efficiency. The profit efficiency suddenly fall in the year 2009 indicating that the financial crisis has negatively affected the profitability of the leasing firms in Pakistan.
The efficiency trend modarabas is provided in Figure 1 which suggest that profit efficiency of the modaraba companies has decreased from 2006 to 2008 and after that they have improved their profit efficiency with the raise in their profitability. The technical efficiency and cost efficiency are gradually improved over the study period of 2005 to 2010. It indicates that the modaraba companies have raised their efficiency level over the study period. The financial crisis has not affected their efficiency since Modarabas has lower participation in the financial sector of Pakistan.

CONCLUSION

The study of examining the efficiency of modaraba and leasing firms in Pakistan is of significant importance since both these industries although have small share in the financial sector of Pakistan but these sectors have the potential to grow. Therefore, the present study tried to examine the level of efficiency with the SFA technique over the period of 2005 to 2010. The results indicated that Modaraba companies are more cost efficient as than leasing companies whereas; in contrast leasing companies are found more technical efficient than the modaraba companies. It indicates that the modarabas are optimally utilizing their resources to reduce the overall cost of doing business whereas; the leasing companies are producing higher outputs than the modaraba companies.

Therefore, it is important to raise the overall growth of the economy since the financial institutions channelize the funds across various sectors of economy. We can conclude various that the profit efficiency in found 86.2%, technical efficiency 86.5% where as the cost efficiency is found 89% in the leasing companies of Pakistan. Moreover, the technical efficiency and the cost efficiency almost remain the same over the study period. The profit efficiency is significantly decreased in 2009 due to financial uncertainties in the country.

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