PRIMARY RESEARCH

Efficiency Analysis of Muḍārabah and Leasing Firms in Pakistan

Muhammad Jam e Kausar Ali Asghar 1*, Abdul Zahid Khan 2, Hammad Hassan Mirza 3, Tariq Iqbal Khan 4, Muhammad Munir Khan 5
1 Department of Business Administration, University of South Asia, Lahore, Pakistan
2 Faculty of Management Sciences, International Islamic University, Islamabad, Pakistan
3 Noon Business School, University of Sargodha, Sargodha, Pakistan
4 Department of Management Sciences, University of Haripur, Haripur, Pakistan
5 Cardiff Metropolitan University, Wales, UK

Keywords
Efficiency
DEA
Muḍārabah Firms
Leasing Firms
Tobit

Abstract. Leasing firms consider the conventional interest-based method whereas, the muḍārabah firms consider the Shari‘ah-based non-interest-based method to operate in the financial market. The role of both these Financial Institutions (FIs) is of much importance for the sustainable development of Small and Medium Enterprises (SMEs). While comparing muḍārabah firms and conventional leasing firms, in the first stage, the current paper has computed Technical Efficiency (TE), Pure Technical Efficiency (PTE), and Scale Efficiency (SE) of muḍārabah and leasing firms. Data Envelopment Analysis (DEA) is applied by following a value-added approach. Equity, liabilities, fixed assets, Operating expenses and are selected as input variables whereas, income and investments are selected as output variables. The results suggest that Shari‘ah-compliant muḍārabah firms are competing well with conventional leasing firms. It indicates that there is no major difference in the efficiency of both FIs. In the second stage, the study also analyzes the association of firm-specific factors with efficiency with the help of the Tobit regression model which suggests that leverage, tangibility, operating expenses, and profitability of the firm are significantly related to the efficiency of both Financial Institutions.

KAUJIE Classification: K2, K5
JEL Classification: L25, M1

INTRODUCTION

The Efficient operations of Financial Institutions (FIs) have significant importance for the overall economic growth of any country as they channelize funds in different sectors of the economy (Asghar et al., 2019). Shari‘ah-compliant muḍārabah and conventional leasing

*Corresponding author: Muhammad Jam e Kausar Ali Asghar
†Email: jamekausar@yahoo.com
firms have a noteworthy contribution in the economic development along with the banks since they are financially facilitating the SMEs. Leasing firms provide heavy equipment on lease whereas, muḍārābah firms provide Sharī‘ah-based financial products e.g. ijārah (Islamic way of leasing) and both these FIs mostly target the small and medium-scale industry. Mudārābah by definition is a special kind of agreement between two parties, one provides the finance (rabb al-māl), whereas, other contributes through management skills and efforts (muḍārib). Mudārābah firms offer various products such as; ijārah, mushārakah, muḍārābah, and murābāḥah but within the limits of Sharī‘ah law.

SMEs in Pakistan consists of various small size firms like leather, fisheries, steel, garments, fisheries, and automobile vendors, etc. The commercial banks do not financially assist these SMEs as most of these don’t have collateral for a large number of loans to purchase equipment and machinery. Their owners are not much resourceful with limited manpower which exposes them to a high level of uncertainty to keep running their businesses (Rehman, 2017). Both FIs provide leasing facilities to SMEs on ease financial terms to purchase costly machinery and raw material. Therefore, the contribution of both leasing and muḍārābah firms to support SMEs have much importance. If both these institutions are working efficiently, then it will help the SMEs to grow and contributes further to the economic progress of Pakistan. As both FIs have different methods of operations, therefore, it is interesting to investigate which of the sector is working efficiently. Therefore, the primary objective of the present study is to compare the efficiency of Sharī‘ah-compliant muḍārābah firms with conventional leasing firms to know which one is outperforming since later is following conventional interest-based financial system whereas the former one is following Sharī‘ah-based system.

The efficiency of a firm depends on various firm-specific factors that contribute either to increasing or decreasing the level of efficiency of financial institutions. The results regarding these factors are mixed in the literature (Asghar, 2015). Therefore, the second objective of the study is to examine what are the firm-specific factors which significantly influence their efficiency. This research study helps the management of both these FIs able to know where they are lacking and how they are performing in their industry and enables the regulators to know which of the industry is performing better so that they can introduce financial reforms accordingly to enhance their level of efficiency. The remaining of the paper is organized as follows; section II described empirical studies on this issue whereas, the methodology of the study is explained in section III. Section IV provides empirical results whereas the study concludes in section V.

LITERATURE REVIEW

Efficiency analysis of FIs is intensively studied in Pakistan e.g. many studies analyzed the efficiency of mutual funds (Afza & Amir, 2013; Asghar et al., 2019) whereas, there are also studies that have examined the efficiency of insurance firms (Noreen, 2009). There is a large number of papers on evaluating the efficiency of banks (Afza & Asghar, 2017; Zhu et al., 2020). However, there is limited evidence that examined the efficiency of both leasing firms and muḍārābah firms. Marta (2009) applied the Stochastic Frontier Approach (SFA) and examines the efficiency of leasing firms in Italy. This study found 74% cost efficiency
throughout for 2002 to 2006 in leasing firms of Italy.

Although, there are studies in Pakistan that have compared the efficiency of Islamic banks with conventional banks (Aman et al., 2016) and there are also studies on comparison of the efficiency of Islamic *takāful* companies with conventional insurance companies (Asghar et al., 2019) However, to the best of author’s knowledge there is a single significant study which has examined the efficiency of both *muḍārabah* and leasing companies. Asghar et al. (2013) analyzed the level of efficiency of both *muḍārabah* firms and leasing firms with the help of the SFA technique throughout for 2005 to 2010. The results suggested that the level of cost-efficiency in leasing firms was lower than *muḍārabah* firms, whereas, *muḍārabah* firms had lower technical efficiency than the leasing firms.

Taking the pieces of evidence from the previous literature related to determinants of FIs’ efficiency, this study selected four inputs variables; Operating expenses (Masood & Ashraf, 2012; Moussa, 2015; Siraj & Pillai, 2012; Tarus et al., 2012), liabilities (Plantin, 2015; Valverde & Fernandez, 2007), fixed assets (Anbar & Alper, 2011; Berger et al., 2017; Ryan et al., 2014; Yudistira, 2004) and equity (Groff & Morec, 2020; Mondal & Ghosh, 2012; Samad, 2004), and two outputs variables; income (Brar & Singh, 2016; Siraj & Pillai, 2012) and investments (Ashraf et al., 2016; Zaher & Kabir, 2001) to analyses and compare the efficiency of *muḍārabah* and leasing firms.

This paper contributes to empirical literature in various ways since this study compared the level of efficiency in Sharī‘ah compliance *muḍārabah* firms with conventional leasing firms with the help of DEA rather than SFA since the literature suggest that in the case of small sample size, DEA is a much better technique as compared to SFA (Cummins & Rubio-Misas, 2006). Moreover, DEA efficiency scores are highly correlated with conventional performance measures (Cummins & Zi, 1998). Furthermore, to the best of the authors’ knowledge, there is no significant study that has included the effect of various firm-specific factors with various types of efficiencies of both *muḍārabah* and leasing firms in the empirical literature.

**METHODOLOGY**

Efficiency studies have analyzed the efficiency of FIs with various techniques. There are mainly two types of categories in this regard; parametric and non- approaches. Parametric approaches are SFA, Distribution Free Approach (DFA), and Thick Frontier Approach (TFA) whereas, DEA and Free Disposal Hull (FDH) are non-parametric approaches. As discussed earlier, this study has applied the DEA approach to measure the efficiency of *muḍārabah* and leasing firms. Charnes, Cooper and Rhodes (1978) developed DEA. DEA is the most suitable approach for the computing efficiency of both leasing firms and *muḍārabah* firms. It compares the efficiency of relative firms within the industry and determines efficiency between 0 and 1. If a firm reaches the efficiency level of 1, it shows that the DMU is efficient and inefficient if it’s less than 1. This study has computed; TE, PTE and SE, each of these efficiencies describe diverse information about these FIs.

**Input & Output Variables**

It is difficult to select input and output variables for both these FIs since there are limited
studies on this issue. This study applied a value-added approach and selected four inputs; Operating expenses, liabilities, fixed assets and equity. Operating expenses depict the overall spending of the firm, total liability and equity include the financing side of the balance sheet whereas, fixed assets depict the financial health of the business. This study has selected two outputs; income and investments. 

Mudarabah firms invest in "Sharī'ah compliance" investments, particularly in ijarah (Islamic way of leasing) whereas leasing firms invest in lease finance investments. Inputs and outputs are also presented in Table 1.

| TABLE 1 | Input and Output Variables Mudarabah and Leasing Firms |
|----------|--------------------------------------------------------|
| Variable  | Description                                         | Type      | Measure                                           |
| Income    | Total Income of firm                                 | Output    | Total Income of firm                              |
| Investment| Financing lease financial assets and investments     | Output    | Financing lease financial assets and investments  |
| Operating Expenses | Total operating expenses of the firm | Input    | Total operating expenses of the firm              |
| Equity    | Total equity of the firm                             | Input    | Total equity of the firm                          |
| Liability | Total liabilities of the firm                        | Input    | Total liabilities of the firm                     |
| Fixed Assets | Total fixed assets of the firm                      | Input    | Total fixed assets of the firm                    |

Tobit Model

The current study further examines the relationship of company-specific features with the efficiency of both these FIs to find their association with various efficiencies. The firm characteristics include; a dummy variable which is 1 for mudarabah firms and 0 for leasing firms to investigate whether Sharī'ah compliance mudarabah companies are performing better or not, other firm-specific variables are firm size, leverage, operating efficiency, tangibility, lease finance assets profitability and age of firm after commencing business. This study has preferred Tobit regression analysis amongst other regression techniques by Pasiouras et al. (2008) since it also takes into account the censored nature of efficiency scores as they vary between 1 and 0. The final model is described in the below equation.

\[
\theta_{i,t} = \beta_1 + \beta_2 DSharia_{i,t} + \beta_3 SZ_{i,t} + \beta_4 LVRG_{i,t} + \beta_5 OE_{i,t} + \beta_6 TANGBL_{i,t} + \beta_7 LEASEAS_{i,t} + \beta_8 ROA_{i,t} + \beta_9 AGE_{i,t} + \epsilon_{i,t}
\]

Where:

- **DSHARIA**: Dummy variable with a value of 1 for mudarabah firms otherwise 0
- **SZ**: natural log of total assets
- **LVRG**: Debt to Equity ratio
- **OE**: Operating Expenses to Total Expenses in percentage
- **TNGBL**: Total Tangible Assets to Total Assets of the firm in percentage
- **LEASEAS**: Assets kept for lease finance to Total Assets in percentage
- **ROA**: EBIT to Total Assets in percentage
- **AGE**: total number of years after commencement of business
Data
Data is gathered from financial reports of 24 muḍārabah and 9 leasing companies over the study period of 2011 to 2015. The descriptive statistics summary for all variables is shown in Table (2). The mean total income of both FIs is raised from Rs. 324 million to Rs. 382 million over the study period. The total lease investments are also improved from Rs. 1436 million to Rs. 1935 million over the study period, this can be attributed to overall growth in both FIs. Like both outputs, the inputs are also increased which indicates that the cost of doing business is also greater than before which can be attributed to inflation and the overall increase in the cost of financing. The descriptive statistics of firm-specific variables show that there is a high level of dispersion between the firms since most of the variables have a higher standard deviation. This is because both these industries are highly fragmented.

| Variables | Years => | 2011 | 2012 | 2013 | 2014 | 2015 |
|-----------|---------|------|------|------|------|------|
| Income    | Mean    | 324.12 | 382.56 | 360.6 | 371.5 | 382.28 |
|           | S.D     | 616.69 | 702.92 | 774.66 | 812.53 | 882.12 |
| Investments | Mean | 1436.43 | 1405.19 | 1434.01 | 1806.02 | 1935.22 |
|           | S.D     | 3323.11 | 3362.73 | 3547.6 | 4176.57 | 4825.64 |
| Operating Efficiency | Mean | 142.57 | 173.66 | 154.01 | 177.22 | 194.63 |
|           | S.D     | 270.79 | 323.87 | 328.71 | 388.04 | 446.75 |
| Equity    | Mean    | 519.59 | 595.45 | 540.78 | 677.02 | 736.79 |
|           | S.D     | 628.83 | 707.46 | 700.41 | 903.00 | 1011.75 |
| Liability | Mean    | 1413.92 | 1524.2 | 1530.16 | 1517.52 | 1604.53 |
|           | S.D     | 3522.23 | 3685.16 | 3881.29 | 3956.83 | 4526.54 |
| Assets    | Mean    | 91.44 | 213.66 | 142.81 | 109.9 | 119.59 |
|           | S.D     | 254.43 | 496.57 | 332.48 | 329.04 | 336.56 |

Empirical Results
Efficiency scores of each muḍārabah and leasing firm are provided in tables 3 and 4, respectively. The TE in the muḍārabah firms is found 0.879 whereas, it is 0.902 in the leasing firms. It indicates that leasing firms are comparatively efficient in their operational efficiency in contrast to Sharī‘ah-based muḍārabah firms. The muḍārabah results suggest that First Equity, Allied Rental, B.F, First Habib, First Imrooz, First Punjab, First Habib Bank and Standard Chartered are technical efficient firms whereas, First Fidelity and First IBL are found least technical efficient. The reason behind their inefficiency is their comparative utilization of higher inputs as compared to other muḍārabah firms. Moreover, income and investments are also gradually decreased in both these firms.

The highest TE is achieved by NBP, ORIX Leasing Pakistan and Standard Chartered amongst the leasing firms with an efficiency score of 1. The reason behind this is their larger size as compared to other firms which enable them to utilize their resources with the advantage of economies of scale to produce their outputs as compared to their rival firms. The
lowest TE found in Security Leasing Corporation with 0.63, which might be lower output with high consumption of inputs. The main reason behind inefficiency is a decline in total assets, total income and total investment over the study period.

| TABLE 3 |
| --- |
| **Input and Output Variables Mudārah and Leasing Firms** |
| **Mudārah** Firms | TE | PTE | SE |
| --- | --- | --- | --- |
| Allied Rental | 1 | 1 | 1 |
| B.F | 1 | 1 | 1 |
| B.R.R. Guardian | 0.807 | 0.855 | 0.944 |
| Crescent Standard | 0.9 | 0.964 | 0.928 |
| First Al-Noor | 0.762 | 0.829 | 0.93 |
| First Elite Capital | 0.931 | 0.992 | 0.939 |
| First Equity | 1 | 1 | 1 |
| First Fidelity Leasing | 0.637 | 0.661 | 0.95 |
| First Habib | 1 | 1 | 1 |
| First Habib Bank | 1 | 1 | 1 |
| First IBL | 0.664 | 0.728 | 0.898 |
| First Imrooz | 1 | 1 | 1 |
| First National Bank | 0.977 | 0.978 | 0.999 |
| First Pak | 0.841 | 1 | 0.841 |
| First Paramount | 0.858 | 0.888 | 0.966 |
| First Prudential | 0.728 | 0.855 | 0.858 |
| First Punjab | 1 | 1 | 1 |
| First Treet Manufacturing | 0.755 | 1 | 0.755 |
| First UDL | 0.786 | 0.827 | 0.954 |
| KASB | 0.922 | 0.936 |
| **Mudārah** Al-Mali | 0.777 | 0.831 |
| Standard Chartered | 1 | 1 | 1 |
| Trust | 0.878 | 0.903 | 0.974 |
| Mean Efficiency | 0.879 | 0.924 | 0.948 |
| Maximum Efficiency | 1 | 1 | 1 |
| Minimum Efficiency | 0.637 | 0.661 | 0.755 |

TE: Technical Efficiency, PTE: Pure, Technical Efficiency, SE: Scale Efficiency

There is no difference amongst both industries in PTE results that suggests both Sharī‘ah-based and conventional leasing firms are operating managerially at the same level. This may be because there may be the same type of employees with related skills and structure. Allied Rental, B.F, First Habib Bank, First Equity, First Habib, First Imrooz, First Punjab and Standard Chartered are found most efficient firms with an efficiency score of 1. These firms indicate that they are optimally using their inputs. The most inefficient firms are First Fidelity Leasing and First IBL with an efficiency of 0.66 and 0.72, respectively and the reason behind
inefficiency is the lack of good managerial skills in these firms. Therefore, the firm has to increase its managerial procedures to raise its PTE. Moreover, both these firms have also the lowest level of TE which implies that they need to world on their managerial inefficiency to improve both PTE and TE.

Amongst the leasing firms, Grays, NBP, and Standard Chartered are found pure technical efficient, these results indicate that they did good management so that’s why they are purer technical efficient than other leasing firms. Saudi Pak and Security are found least pure technical efficient since their PTE scores are 0.74 and 0.71, respectively. The lowest TE reveals that firms failed to optimally utilize their resources.

SE in the conventional leasing firms is found higher than the Sharī‘ah compliance muḍārabah firms. It also makes leasing firms comparatively more technically efficient than muḍārabah firms since the PTE was found the same in both sectors. Therefore, muḍārabah firms need to adjust their scale and have to work at the right scale to raise their TE. Allied Rental, B.F First Equity, First Habib, First Habib Bank, First Imrooz, First Punjab and Standard Chartered are found most scale efficient firms with an efficiency score of 1 which may be due to increases in their size. The lease SE is found in First Treet Manufacturing Muḍārabah 0.71; the size of this firm is decreased in terms of total assets over the study period.

The highest scale efficient leasing firms are Grays, NBP and Standard Chartered. They have a higher efficiency level due to operating at the correct level. The lowest SE is found in Security Leasing which is at 0.85 which may be attributed to its small size.

| Leasing Firms         | TE     | PTE     | SE     |
|-----------------------|--------|---------|--------|
| Capital Assets        | 0.884  | 0.947   | 0.928  |
| Grays                 | 0.981  | 1       | 0.981  |
| NBP                   | 1      | 1       | 1      |
| ORIX                  | 1      | 1       | 1      |
| Pak-Gulf              | 0.943  | 0.956   | 0.987  |
| Saudi Pak             | 0.729  | 0.744   | 0.983  |
| Security              | 0.632  | 0.71    | 0.857  |
| SME                   | 0.951  | 0.959   | 0.991  |
| Standard Chartered    | 1      | 1       | 1      |
| Mean Efficiency       | 0.902  | 0.924   | 0.969  |
| Maximum Efficiency    | 1      | 1       | 1      |
| Minimum Efficiency    | 0.632  | 0.71    | 0.857  |

TE: Technical Efficiency, PTE: Pure, Technical Efficiency, SE: Scale Efficiency

The efficiency trend analysis of modraba and leasing firms is presented in figures 1 and 2, respectively. It indicates that TE and PTE of both muḍārabah and leasing firms have fallen whereas, SE almost remains the same. The market share of both muḍārabah and leasing firms
is fallen as compared to other FIs working in Pakistan (Asghar, 2015). Both their sectors have less accessibility in wide geographics of Pakistan in comparison to commercial banks. Therefore, both these sectors need to work on enhancing the accessibility and awareness of their products to increase their market share which may ultimately increase their efficiency.

The relationship of firm-specific variables with the efficiency of both FIs is provided in Table 5. Although the association between Shari'ah compliance and efficiency scores is found positive, it is not significant. Therefore, we cannot establish that there is a significant difference in the level of efficiency of both these FIs. A positive and significant association of firm size (SZ) is found with SE. It indicates that large FIs are performing better than the small leasing firms in terms of size efficiency. Leverage (LVRG) is found significantly and positively associated with efficiency scores which indicates that both these FIs with larger debt are more efficient than their counterparts. It may be due to the higher cost associated with equity capital.

![FIGURE 1. Efficiency of Mudārabah firms in Pakistan](image)

![FIGURE 2. Efficiency of Leasing firms in Pakistan](image)
### TABLE 5

#### Tobit Regression Model Results

| Variables   | TE     |                  | PTE     |                  | SE      |                  |
|-------------|--------|------------------|---------|------------------|---------|------------------|
|             | Coef   | p-value          | Coef    | p-value          | Coef    | p-value          |
| C           | 0.960*** | 0.000            | 1.408*** | 0.000            | 0.843*** | 0.000            |
| $D_{Sharia}$| 0.020  | 0.682            | 0.020  | 0.694            | 0.019  | 0.510            |
| SZ          | 0.021  | 0.314            | -0.036 | 0.124            | 0.033***| 0.007            |
| LVRG        | 0.019* | 0.095            | 0.028** | 0.038            | 0.005  | 0.357            |
| OE          | -0.001** | 0.024          | -0.001*** | 0.003            | 0.000  | 0.141            |
| TNGBL       | -0.003*** | 0.000         | -0.003*** | 0.002            | -0.001*** | 0.002          |
| LEASEAS     | 0.000  | 0.634            | 0.000  | 0.677            | 0.000  | 0.625            |
| ROA         | 0.013*** | 0.000          | 0.018*** | 0.000            | 0.003* | 0.085            |
| AGE         | -0.007 | 0.131            | -0.007 | 0.135            | -0.002 | 0.449            |
| No. of Obs. | 144    |                  | 144    |                  | 144    |                  |
| Log likelihood | -30.447 |               | -36.990 |               | 11.102 |                  |

Where: $D_{Sharia}$: Dummy variable with a value of 1 for muḍārabah firms otherwise 0

SZ: natural log of total assets, LVRG; Debt to Equity, OE: Operating Expenses to Total Expenses, TNGBL: Total Tangible Assets of the firm, LEASEAS: Assets kept for lease finance, ROA: EBIT to Total Assets, AGE: total number of years after commencement of business

Operating expenses (OE) are found significantly and negatively related to the efficiency of the firms which implies that the firms with higher operating costs fail to produce at an optimal level. This is a fact since higher costs result in lower efficiency due to higher overall inputs. The same results were also found by Abel and Pierre (2016). Surprisingly, tangibility (TNGBL) is found significantly and negatively related to all of the efficiencies however, the coefficient is quite low. It implies that higher tangibility does not support these firms to enhance their efficiency level. This result is consistent with the finding of Alhassan and Kwaku (2016). Profitability (ROA) is significantly and positively related to all of the efficiencies. This association indicates that FIs with high profits can achieve not only operational efficiency (TE) but also managerial efficiency (PTE) and size efficiency (SE). The reason behind this relationship is the management’s optimal utilization of resources to earn higher profits which ultimately enable them to be the most efficient firm. These results also indicate that most of the firm-specific variables are as expected which validates that the DEA efficiency scores are more related to conventional measure of performance.

### Conclusion

In a Muslim majority country like Pakistan, it is important to investigate whether the Sharī‘ah-compliant FIs can compete with the conventional FIs since they are recently evolved and have comparatively lower resources and products to compete in the market as compared to their conventional counterparts. This study compared the efficiency of Sharī‘ah-compliant muḍārabah firms with conventional leasing firms over the period 2011 to 2015. Various conclusions can be deduced from this study, firstly, the efficiency results suggest that conventional leasing firms are slightly higher efficient in contrast to Sharī‘ah-compliant muḍārabah firms
particularly in terms of; operating and size efficiency. Although the number of muḍārabah firms is higher still there is room for improvement. They need to improve their size to ultimately enhance their operational efficiency since managerial efficiency is found at the same level in both FIs.

Secondly, the operational efficiency and managerial efficiency are dropped over the study period suggesting that both FIs need to take care of their managerial efficiency since size efficiency did not change over the study period. Therefore, the management needs to reduce their cost of doing business or have to further enhance their outputs with better utilization in various financial markets. Thirdly, larger firms with higher leverage and profits and with lower operating expenses and tangibility can outperform their counterparts. Therefore, the shareholders need to select these firms while investing. Besides, management needs to finance its investment from debt and financing certificates rather than equity since the cost of debt is low. Moreover, they also need to reduce their operating expenses to further increase their level of efficiency.

In the future, researchers can measure the efficiency of muḍārabah and leasing firms with different input and output variable selection approaches or they can also compare the efficiency of both these FIs with other FIs operating in different Islamic countries for comprehensive evidence.

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