



Efficiency Analysis of Modaraba Companies in Pakistan

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ABSTRACT

In Pakistan's economic development Modaraba sector also contribute. It provides heavy machinery and equipment to the small enterprises which are facing financial difficulties in running the business. Modaraba provide shariah based business solutions and different Islamic products like Musharika, Modaraba, Murabaha, Ijarah, Salam etc. As for as the study on modaraba sector's efficiency is concerned, a very few studies are conducted on that topic and a limited literature available on that topic. This study aims to measure the CE and PE of Pakistan's modaraba sector from 2010 to 2019 by taking the unbalanced panel data of 30 modaraba firms registered at PSX through the application of parametric method SFA in the first step of analysis. The Input and output variables were selected from the existing literature. This study uses 2 outputs such as Income and Investment while 3 Inputs such as Operating Expenses, Equity, and Liability. In the second step of analysis, it is investigated that how CE and PE scores are affected through the variables also called determinants such as Size, Investment, ROA, Liquidity, and Equity. The results suggest that Size, ROA, Equity has significant impact on TEP while Size, Investment, Liquidity, and Equity has significant impact on TEC.

Keywords: Cost Efficiency, Profit Efficiency, SFA, Tobit Regression, Modaraba Companies

INTRODUCTION

All businesses, including financial institutions, are concerned with increasing efficiency. Much of the efficiency debate and research is based on the assumption that greater efficiency would lead to improved financial performance. Efficiency is a fundamental concept that has long been researched in financial institutions. In 21 nations, a review of 130 such research is available by (Berger & Humphrey, 1997). Berger & Humphrey described the technical approach they used to organize papers as parametric SFA, TFA, DFA, or non-econometric FDH, DEA, IN and MOS.

In present's volatile and competitive economic environment, FIs have become

increasingly important. Financial institutions, in essence, reinvest idle cash into the economy's numerous productive channels. As a result, strong financial institutions are essential for any country's long-term success. Producing high-quality products or cutting input costs are two ways financial institutions can become more efficient. There are several efficiency notions that explain various features, such as technological efficiency, which defines a financial institution's ability to maximize outputs while using fewer inputs. Profit efficiency compares a company's profitability to that of its competitors, whereas cost-efficiency compares a company's cost to that of the top performers. The financial industry plays a crucial part in a sustainable economy all around the world. Also, it plays an important part inside an emerging country like Pakistan. This accounts for about 5 percentage points of Pakistan's Gross Domestic Product (Q. M. Khan & Kouser, 2021).

Efficiency is a relative term associated with transforming input into output for superior results. The actual result is compared to an intended outcome, such as a standard, target, or ideal outcome, as dictated by the evaluation. In the existing literature, efficiency's many distinct types are highlighted, like PE, RE, CE, TE, and so on. All categories of efficiency have varied meanings and applications to the firm's operations, resulting in diverse insights. For example, a company is efficient in terms of technical efficiency whether it is capable of producing a specific output with minimal input. A cost-effective firm incurs the least amount of expense to generate a given level of production. Furthermore, a corporation is said to be profit efficient if it earns the maximum level of profit has a predetermined number of inputs and outputs (Afza & Yusuf, 2013).

Modaraba is a financial institution that contributes to the Pakistan's economic development along with other FIs. Let's start with a definition of Modaraba. Modaraba is a company where certain persons invest cash also Modaraba provides management expertise. The profit is distributed between the two parties depending on a percentage/ratio that has been agreed upon. A loss is allocated between investors in amount to their investment when one happens. It's possible to utilize "Multiple Purpose" either "Special Purpose." The "Modaraba Companies Modaraba Rules, 1981" should be followed by the company (Q. M. Khan & Kouser, 2021).

Because they move cash into diverse sectors of the economy, FIs (financial institutions) efficient operations are crucial for a country's overall economic growth (Asghar et al., 2019). Mudarabah is a Shariah-compliant and traditional leasing company that, like banks, contributes significantly to economic development by providing financial assistance to SMEs. Both leasing and Mudarabah companies serve small and medium-sized businesses, with leasing companies leasing heavy equipment and Mudarabah companies offering Shariah-based financial solutions, such as Ijarah (Islamic leasing). Mudarabah is a unique sort of agreement in which Rabb al-mal offers financial support while the Mudarib contributes via administration skills and efforts. Mudarabah businesses provide a wide range of services, including Ijarah, Musharakah, Mudarabah, and Murabaha, all of which are compliant with Shariah law. Pakistan's SMEs include leather, steel, clothing, fishery, and automobile vendors, among other small companies. Commercial banks do not provide financial support to SMEs because

they lack sufficient security for countless loans to buy equipment and machineries. Their proprietors aren't particularly diverse, and they don't have much labor, therefore they're at serious risk of losing their business (Rehman et al., 2017). Both financial institutions provide SMEs with low-cost leasing solutions to assist them in purchasing pricey machinery and raw materials. As a result, the contributions of leasing and mudarabah sectors to SMEs' help are crucial. If both of these organizations run well, they will help SMEs thrive and contribute to Pakistan's economic development. Because the two financial organizations function in such different ways, it'll be interesting to observe which is more efficient (Asghar et al., 2020).

So, in this paper, we calculate the Modaraba sector's efficiency scores of the economy. It also computes yearly average, maximum and minimum scores of CE, and PE (Cost Efficiency, and Profit Efficiency). The econometric approach SFA is used to calculate efficiency scores. As a result, the conclusions of this study will be relevant for future studies and academics interested in the efficiency analysis of Pakistani Modaraba companies. Few studies on this topic are conducted so there is need to create awareness about the importance of Modaraba Companies in the economic development of Pakistan. While research has been done on several financial sectors in Pakistan, such as banking, insurance, and mutual funds, this study will focus on Modaraba enterprises. How can modaraba companies get the most out of their resources? Because the modaraba sectors play a critical part in an economy's growth, the efficiency evaluation of the sector is critical in determining the answer to this question. Previous studies provide limited information just for four to five years while in this research there is information of recent ten years from 2010 to 2019. In Pakistan, no research on modaraba companies has been undertaken utilizing this analytical methodology, SFA. This research will look at the modaraba firms', as well as the factors that influence overall efficiency. This analysis will look at two different forms of efficiencies: CE, and PE. Efficiency measurement is now the most important thing to know to understand the shortcomings of Pakistan's modaraba companies and to create a more efficient financial system. The most efficient use of resources will boost growth while also contributing to the economy. This will be the first time a two-stage analysis will be used to estimate the modaraba firms' efficiency by employing SFA. A Truncated regression is utilized in the second step to measure the determinants' effect on overall efficiency. In this research new variables included named as Size, Investment, ROA, Liquidity, and Equity. According to the literature, no one has employed SFA technique and Tobit regression model for efficiency evaluation in this industry in Pakistan.

This study will provide answers to several questions, including:

1. What are the modaraba firms in Pakistan's efficiency ratings?
2. Which company is the most efficient in terms of resource utilization?
3. What are the variables that need to be changed, as well as the improvements that are required for inefficient organizations to increase their technological efficiency?

The research of modaraba company efficiency is crucial because it will add to the available literature in the accompanying ways. For starters, managers can pinpoint

the source of their reduced efficiency because different types of efficiencies express distinct aspects of the firm's dynamics. Second, this research will assist regulators in comprehending the overall industry's strengths as well as the influence of their time-to-time imposed changes. Finally, the results of this study will assist investors in ranking companies based on their efficiency scores. Furthermore, the current research will benefit all stakeholders and scholars. Five chapters make up the paper. First chapter is about study's introduction. Chapter 2 examines the literature on fundamental efficiency ideas. 3rd chapter includes a thorough explanation of the materials used in the two stage analysis. The fourth chapter of this analysis discusses the SFA results, as well as Tobit regression results and their interpretations. In the fifth chapter, the study will be summarized and recommendations for improving the Pakistan's modaraba organizations' efficiency will be made.

LITERATURE REVIEW

TE, AE, CE, and SE are some of how the concept of efficiency can be explained. These multiple efficiencies have varied definitions, but the underlying concept is the same: how efficiently inputs are used to produce outputs. Farrell created the framework for the efficiency notion, stating that a corporation is efficient assuming it generates the output's largest amount while consuming the least number of inputs. He said that efficiency may be determined by comparing the concerned border to the best frontier using the frontier approach, just note that it evaluates the deviation of the company limits set from the optimal limits (M. H. Hassan & Hassan, 2018b). Hadhek et al. (2018) using SFA, determine the determinants of Islamic banks' PE approach to the stochastic frontier from 2005 and 2014, by acquiring 37 Islamic banks in fifteen countries. The author explores external and internal variables that can explain sources of inefficiency as well as compares the Islamic banks' efficiency. The results reveal that improving PE ratings in banks is relatively essential. Shair et al. (2021) the increase of performance and TFP was investigated. The effect of competition and risk on effectiveness and TFP development in the banking industry of Pakistan from 2007 to 2017 was measured utilizing the DEA-based MPI and determined using the GMM model. The findings indicate that credit and liquidity risks are positively associated, whereas insolvency harms performance and TFP development; competition increases TE but decreases TE, and other explanatory variables have noteworthy associations with several productivities and TFP development.

According to a survey of the literature, the majority of study on financial institutions' empirical efficiency analysis focuses on advanced economies. Moreover, this is a critical issue for developing economies as well, since it aims to improve the efficiency of financial institutions that have recently implemented various economic reforms. The banks' efficiency in emerging countries has gotten a lot of attention in the previous three decades. According to (Hayat, 2011), efficiency refers to the most effective and efficient utilization of previously existing resources. With a reliance on external money, effective banking sectors may be able to assist in the rapid expansion of countries as evidenced by empirical evidence (Mirzaei & Moore, 2019). Khalil et al. (2015) the CE of Pakistan's banking industry is investigated utilizing SFA techniques

to evaluate a trans-log cost function on quarterly panel data from 2005 to 2013. The cost function analysis found that Pakistan's banking industry had a good opportunity improve its CE by increasing output through diversification or by reducing the cost of inputs. Ali Asghar and Afza (2013) from 2005 to 2010, the performance of Modaraba and Leasing firms in Pakistan was evaluated by computing Technical, Cost, and Profit efficiencies. The value-added strategy is utilized to select input and output variables using a parametric SFA. The study considers three inputs: labor and business services, equity, and debt, as well as two outputs: income and investment. According to the findings, leasing firms are 86 percent PE, 87 percent TE, and 89 percent CE, whereas modaraba companies are 87 percent PE, 51 percent TE, and 96 percent CE. However, it has been discovered that leasing firms' profit efficiency was significantly affected by the financial crisis of 2009, whereas modaraba companies' profit efficiency did not suffer. The effectiveness of Pakistani modaraba firms listed on the PSX is assessed in this study using an econometric methodology, named SFA. CE, and PE are the two basic categories of efficiency measurement. This will be the first time a two-stage study will be used to assess the effectiveness of modaraba companies. ESs are measured using SFA in the first step, and a Tobit regression is used on ESs in the second step. No one has ever utilized this method for evaluating efficiency in this industry.

METHODOLOGY

Two fundamental methodologies are utilized to quantify efficiency in the current literature. The first is an econometric approach, while the second is a non-econometric. The econometric method is also known as the parametric approach. Looking at the other end of the spectrum, we can see that the non-parametric method is a type of linear programming. These frontier approaches are used to determine how close the concerned units (banks, insurance companies, leasing companies, and so on) are to the best frontier. The econometric technique has various advantages, such as allowing noise in the case of inefficiency. However, functional forms of production, cost, profit, or revenue, as well as some assumptions, are still required (Mokhtar et al., 2006). On the other hand, nonparametric techniques do not necessitate any prior assumptions or production forms. The non-parametric technique also has the disadvantage of not accounting for noise. SFA procedure is applied in this empirical research to analyze the performance of modaraba enterprises in Pakistan. There are several prominent strategies for measuring efficiency's determinants, including regression models that include both OLS and maximum likelihood, however, in this study, a novel methodology called Tobit regression (truncated regression) is utilized. Because the dependent variable, modaraba company efficiency, is between 0 and 1, Tobit regression is used. Among all of these institutions, several organizations that operate at 100% efficiency under the DEA technique form a cluster of values towards one extreme, namely 1, causing bias in the results. The Tobit model, which truncates such observations so that bias may be managed, is advised to deal with such an issue.

Selection of Variables

The input and output variables in this research are based on factors used in previous modaraba and leasing sector studies in the literature, including (Ali Asghar

& Afza, 2013),(Asghar et al., 2020),(Q. M. Khan & Kouser, 2021). All of these investigations were carried out in other studies. As a result, the chosen outputs are income and investment, while the inputs are operating expenses, equity, and liability.

Table 1: Input & Output

Variables	Types
Income	Output
Investment	Output
Operating Expenses	Input
Equity	Input
Liability	Input

Cost and Profit Efficiency

The final model for calculating cost efficiency will be as follows:

$$\ln TC_{kt} = \alpha_0 + \Sigma \beta_i \ln y_{ikt} + \Sigma \square_i \ln w_{ikt} + 0.5 \Sigma \Sigma_{ij} \ln y_{ikt} \ln y_{jkt} + 0.5 \Sigma \Sigma_{\square ij} \ln w_{ikt} \ln w_{jkt} + \Sigma_{\square ij} \ln w_{ikt} \ln y_{jkt} + \Sigma_{\square} \ln z_{kt} + 0.5 \Sigma \Sigma_{\square} \ln z_{kt}^2 + \Sigma \Sigma_{\partial i} \ln z_{kt} \ln w_{ikt} + \Sigma \Sigma_{\square i} \ln z_{kt} \ln y_{ikt} + \Omega t + 0.5 \ell t^2 + \zeta_i \ln w_{ikt} t + \square_i \ln y_{ikt} t + \emptyset \ln z_n t + v_i + u_i$$

As a result, the profit function will look like this:

$$\ln(\pi + k + t)_{kt} = \alpha_0 + \Sigma \beta_i \ln y_{ikt} + \Sigma \square_i \ln w_{ikt} + 0.5 \Sigma \Sigma_{\square ij} \ln y_{ikt} \ln y_{jkt} + 0.5 \Sigma \Sigma_{\square ij} \ln w_{ikt} \ln w_{jkt} + \Sigma \Sigma_{\square ij} \ln w_{ikt} \ln y_{jkt} + \Sigma_{\square} \ln z_{kt} + 0.5 \Sigma \Sigma_{\square} \ln z_{kt}^2 + \Sigma \Sigma_{\partial i} \ln z_{kt} \ln w_{ikt} + \Sigma \Sigma_{\square i} \ln z_{kt} \ln y_{ikt} + \Omega t + 0.5 \ell t^2 + \zeta_i \ln w_{ikt} t + \square_i \ln y_{ikt} t + \emptyset \ln z_n t + v_i - u_i$$

Tobit Regression

In order to cope with censored data, the Tobit regression model has piqued the interest of researchers. This study investigates the association among determinants of firm's performance and the efficiency of modaraba sector in order to determine their relationship with efficiency scores. Firm Size, Investment, ROA, ROE, liquidity, Equity are all firm-specific characteristics. Tobit regression analysis was used over other regression techniques in this study because it gives results between 1 and 0. Here is the Tobit equation:

$$\theta_{i,t} = \beta_1 + \beta_2 SZ_{i,t} + \beta_3 INV_{i,t} + \beta_4 PROF_{i,t} + \beta_5 LQDTY_{i,t} + \beta_6 EQTY_{i,t} + \varepsilon_{i,t}$$

Where:

SZ; Natural Log of Total Assets

INV: Net Investment to Total Assets

PROF: ROA: Profit before Tax to Total Assets

LQDTY; Current Assets to Current Liabilities

EQTY; Total Equity to Total Assets

Unit of Analysis

The Modaraba companies of Pakistan are being considered as units of analysis. For the purpose of estimation, unbalanced panel data will be used. In all, Pakistan has 28 Modaraba firms, but due to unbalanced panel data, all the companies which was operating during 2010 to 2019 are involved in the investigation. As a result, the total observations for modaraba companies will be 261. Data is collected utilizing a secondary data strategy through yearly reports issued by companies. The STATA

software is also used to estimate efficiency.

RESULTS

This chapter briefly discuss the findings of the investigation. Table 2 represent the descriptive statistics of both the leasing and modaraba firms regarding the outputs such as income, investments, and output variables such as operating expenses, equity, and liability together with the dependent variables total cost and total profit. Table 2 indicates that the average total income of modaraba companies decreased by Rs. 185045m to Rs. 327m throughout the research. The total investment of the modaraba companies improved from Rs. 95m to Rs. 382m during the research. This represents the growth in the modaraba sector.

Table 2
Descriptive Statistics of Modaraba Companies

Year		Total Profit	Total Cost	Total Income	Investment	Operating Expenses	Equity	Liability
2010	Mean	30022.54	46617.42308	185045.0587	94749.66615	4.003909515	0.280813892	0.126434304
	SD	82243.77	95998.69135	294263.1826	156263.5558	13.79633541	0	0
2011	Mean	43353.15	50666.34615	211651.315	97089.47885	6.821288002	-0.056142394	0.133079625
	SD	79783.51	125926.3828	329165.633	149597.5611	29.43987499	0	0
2012	Mean	52162.56	65767.92593	297367.5067	176348.2388	6.810155777	0.489689813	0.109630476
	SD	123260.9	179178.4297	512423.8831	341652.7229	28.88194737	0	0
2013	Mean	79783.93	85017.40741	346328.5618	194353.8138	6.92353692	0.49429163	0.092497385
	SD	222345.8	251617.9058	674416.5181	386682.2637	28.8665633	0	0
2014	Mean	63555.92	99606.23077	371350.6084	192413.3431	3.32211925	0.27196073	0.099214667
	SD	141368.1	321970.0058	756938.6222	352278.7867	9.217403237	0	0
2015	Mean	57295.74	113909.9259	346980.6696	197311.9719	4.67424003	0.021318975	0.072874409
	SD	110442	376793.7386	715452.8937	345504.4985	15.00811433	0	0
2016	Mean	44037.93	116481.6296	251212.2375	210778.3613	19.91202169	0.456819844	0.060436273
	SD	93537.78	396584.2971	603133.0782	427095.9562	80.58508707	0	0
2017	Mean	62987.72	139031.76	310975.3919	269510.5562	7.310432592	-0.153429414	0.060152875
	SD	115373.1	448300.146	696165.4214	568556.6097	30.81971817	0	0
2018	Mean	27646.44	174796.4	323837.9145	338029.5869	10.02151301	-0.08413224	0.1311
	SD	130932.7	574704.2677	804318.1319	756379.5631	39.07100358	0	0
2019	Mean	-56986.9	210568.52	327148.2262	382299.5625	9.97827592	0.098955945	0.1346
	SD	497161.5	609912.3698	843457.1246	960095.6348	41.90293347	0	0

Table 3 contains the Descriptive Statistics of efficiency determinants Modaraba firms. These shows the yearly Mean and SD of the size, investment, ROA, Liquidity, Equity, TEP and TEC.

Table 3
Descriptive Statistics of Tobit Regression

Year		Size	Investment	ROA	Liquidity	Equity	TEP	TEC
2010	Mean	942,031	94750	0.041533	5.634719	0.630817	0.960453	0.610178
	SD	1171649.886	156263.5558	0.059770103	9.399506782	0.279736117	0.024461238	0.200067394
2011	Mean	1,013,831	97089	0.047956	6.498193	0.633205	0.947583	0.601678
	SD	1232730.071	149597.5611	0.071780472	8.485301826	0.299124439	0.019128201	0.207095304

2012	Mean	1,320,714	176348	0.033962	5.788328	0.593572	0.905219	0.592702
	SD	1769385.876	341652.7229	0.071712811	9.398244383	0.312438722	0.035033163	0.195413445
2013	Mean	1,430,148	194354	0.036289	4.858369	0.593484	0.946594	0.617487
	SD	1999613.181	386682.2637	0.070892389	5.696521809	0.339665322	0.029330105	0.203619087
2014	Mean	1,425,520	192413	0.027376	6.068670	0.592036	0.812968	0.595442
	SD	1954244.883	352278.7867	0.078220414	11.79524895	0.315068281	0.032038694	0.207231336
2015	Mean	1,340,264	197312	0.038472	8.172411	0.617157	0.960212	0.605624
	SD	1931602.714	345504.4985	0.061666493	13.32865881	0.302022226	0.018622049	0.205848897
2016	Mean	1,372,345	210778	0.018492	6.896826	0.627157	0.948009	0.580406
	SD	2141225.511	427095.9562	0.098211161	13.75520992	0.300689368	0.01936204	0.247158805
2017	Mean	1,763,411	269511	0.033809	5.004425	0.627221	0.964958	0.630628
	SD	2811707.021	568556.6097	0.056094958	6.824611094	0.275610559	0.014510049	0.21119666
2018	Mean	2,034,444	338030	0.014940	3.899365	0.634236	0.961732	0.648273
	SD	3490725.785	756379.5631	0.084810298	4.292601202	0.300022018	0.03540202	0.161057679
2019	Mean	2,084,743	382300	-0.000091	4.900858	0.647503	0.742536	0.595131
	SD	3702997.257	960095.6348	0.072288859	7.36537001	0.345158826	0.149286533	0.165030358

Mean efficiency of modaraba companies presented in table 4. Modaraba companies attained more PE scores as compare to CE scores. Mean PE scores of modaraba sector are 0.916 and CE 0.589. Maximum PE scores are 0.949 and CE 0.853. Minimum PE scores are 0.849 and CE 0.068.

Table 4
Mean Efficiency Scores of Modaraba Companies

Company	TEP	TEC
Allied Rental Modarba	0.943	0.681
Awwal Modaraba	0.909	0.216
B.F. Modaraba	0.928	0.489
B.R.R. Guardian Modaraba	0.895	0.716
Crescent Standard Modaraba	0.927	0.299
First Al-Noor Modarba	0.926	0.678
First Constellation Modaraba	0.949	0.782
First Elite Capital Modaraba	0.924	0.666
First Equity Modarba	0.921	0.661
First Fidelity Leasing Modaraba	0.918	0.603
First Habib Bank Modaraba	0.894	0.368
First Habib Modarba Limited	0.947	0.768
First IBL Modaraba	0.924	0.628
First Imrooz Modaraba Limited	0.925	0.716
First National Bank Modarba	0.887	0.655
First Pakistan Modarba	0.934	0.383
First Paramount Modaraba	0.913	0.685
First Prudential Modarba	0.917	0.586
First Punjab Modarba	0.888	0.600
First Treet Manufacturing Modarba	0.849	0.853
First Tri-Star Modarba	0.928	0.493
First UDL Modarba	0.914	0.651
KASB Modaraba	0.910	0.657
Modaraba Al - Mali	0.920	0.656
Orix Modaraba	0.886	0.688
Popular Islamic Modaraba	0.933	0.696
Sindh Modaraba	0.917	0.369

Standard Chartered Modaraba	0.892	0.653
Trust Modarba	0.925	0.713
UNICAP Modarba	0.936	0.068
Mean Efficiency	0.916	0.589
Max Efficiency	0.949	0.853
Min Efficiency	0.849	0.068

Table 5 consists of modaraba companies results. In the first segment, TEP is dependent variable and Size, Investment, ROA, Liquidity, and Equity are independent variables. Size has negative (coefficient value= -0.0089131) and significant (t value= -2.27, $p < 0.05$). Size has negative but significant impact on TEP. Investment has positive (coefficient value=0.0020826) and insignificant (t value= 0.33, $p > 0.1$). Investment has positive but insignificant impact on TEP. ROA has positive (coefficient value=0.3334289) and significant (t value= 4.72, $p < 0.01$). ROA has positive and significant impact on TEP. Liquidity has negative (coefficient value= -0.0004719) and insignificant (t value= -0.78, $p > 0.1$). Liquidity has negative and insignificant impact on TEP. Equity has positive (coefficient value=0.0359805) and significant (t value= 1.81, $p < 0.1$). Equity has positive and significant impact on TEP.

In the second segment TEC is dependent variable. Size has positive (coefficient value=0.0535694) and significant (t value= 6.63, $p < 0.01$). Size has positive and significant impact on TEC. Investment has negative (coefficient value= -0.0246685) and significant (t value= -1.90, $p < 0.1$). Investment has negative but significant impact on TEC. ROA has negative (coefficient value= -0.0730558) and insignificant (t value= -0.50, $p > 0.1$). ROA has negative and insignificant impact on TEC. Liquidity has negative (coefficient value= -0.0043637) and significant (t value= -3.52, $p < 0.01$). Liquidity has negative but significant impact on TEC. Equity has positive (coefficient value=0.1005545) and significant (t value= 2.46, $p < 0.05$). Equity has significant and positive effect on TEC.

Table 5
Tobit Regression Model Results

TEP	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig	
Size	-.009	.004	-2.27	.024	-.017	-.001	**
Investment	.002	.006	0.33	.742	-.01	.015	
ROA	.333	.071	4.72	0	.194	.473	***
Liquidity	0	.001	-0.78	.435	-.002	.001	
Equity	.036	.02	1.81	.072	-.003	.075	*
Constant	1.003	.058	17.37	0	.89	1.117	***
var(e)	.007	.001	.b	.b	.006	.008	
Mean dependent var		0.916	SD dependent var		0.088		
Pseudo r-squared		-0.060	Number of obs		261		
Chi-square		31.894	Prob > chi2		0.000		
Akaike crit. (AIC)		-546.116	Bayesian crit. (BIC)		-521.164		

*** $p < .01$, ** $p < .05$, * $p < .1$

TEC	Coef.	St.Err.	t-value	p-value	[95% Conf Interval]	Sig
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Size	.054	.008	6.63	0	.038	.069	***
Investment	-.025	.013	-1.90	.058	-.05	.001	*
ROA	-.073	.145	-0.50	.616	-.359	.213	
Liquidity	-.004	.001	-3.52	.001	-.007	-.002	***
Equity	.101	.041	2.46	.015	.02	.181	**
Constant	-.128	.119	-1.08	.283	-.361	.106	
var(e)	.029	.003	.b	.b	.024	.034	
Mean dependent var		0.607	SD dependent var		0.199		
Pseudo r-squared		-0.808	Number of obs		261		
Chi-square		82.233	Prob > chi2		0.000		
Akaike crit. (AIC)		-170.031	Bayesian crit. (BIC)		-145.080		

*** $p < .01$, ** $p < .05$, * $p < .1$

CONCLUSION

As Pakistan is a Muslim country so it is the need of the hour to promote the shariah compliant Islamic mode of financing. The modaraba sector contributes to the development of the country like other FIs. To take loan from the bank required to pledge assets so the small-scale enterprises do not own the heavy equipment and due to financial constraints, they need loans to purchase heavy machinery so the modaraba sector facilitates these enterprises with machinery on installments like *ijarah*. A very few studies on this sector are conducting in Pakistan. The current study aims to explore the efficiency analysis of Pakistani modaraba sector through employing the SFA by taking the companies listed at Pakistan Stock Exchange for 10 years (2010-2019). It also applies Tobit regression to check the factors that influence CE and PE scores calculated through SFA. Variables as determinants of efficiency are Size, Investment, ROA, Liquidity, and Equity. This study used the descriptive statistics to define variables as input and output and efficiency's determinants, which tells about the Mean and SD of the variables. This study used unbalanced panel data. To check that these efficiency scores are determined by which variables a truncated regression is applied in the second stage. This will help the investors to choose whether they have to invest in which of the shariah compliant modaraba firms. The Tobit regression's results revealed that in the shariah compliant modaraba sector Size has a negative but significant impact on TEP while positive and significant impact on TEC. Investment has positively but insignificantly impacted TEP while negatively but significantly impacted TEC. ROA has positively and significantly impacted TEP while negatively and insignificantly impacted TEC. Liquidity has negatively and insignificantly impacted TEP while negatively but significantly impacted TEC. Equity has positively and significantly impacted both TEP and TEC.

The unbalanced panel data is taken in this research. The input variables utilized in this paper are Operating Expenses, Equity, and Liability. The outputs are Income, and Investment. So, various techniques to input and output selection are recommended. Furthermore, the choice of input and output available in the existing literature which researches are previously conducted. Besides that, the sample size of the determinants / control variables can also increase. The future researchers are guided to conduct the combined analysis of both modaraba and leasing sector. Time span of

the study can also be enhanced. It is recommended to the future researchers that they can make comparisons of these sectors with other sectors and also make a comparison of various econometric and non-econometric approaches or it can make comparisons of leasing and modaraba firms with other conventional and shariah compliant firms to know which sector is more efficient. Besides that it can also conducted studies between manufacturing and services sector.

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