

Conference Paper

Islamic Bank Efficiency: A Comparative Study Between Indonesia and Pakistan

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Abstract

This study aims to compare the efficiency level of full-fledged Islamic banks in Indonesia and Pakistan during the period 2012–2016 using data envelopment analysis method based on assumption of CRS, VRS and also scale efficiency. In addition, this study also aims to look at the factors mostly affecting the level of efficiency of the variables studied by using the data panel regression method. This study used four samples of BUS in Indonesia and four samples of BUS in Pakistan in the first to fourth quarter of 2012–2016. Considering the result of research, full-fledged Islamic banks in Indonesia are more efficient than full-fledged Islamic banks in Pakistan according to the assumption of CRS, VRS and Scale, but there is no significant difference of efficiency value between full-fledged Islamic banks in Indonesia and those in Pakistan. In Indonesia, the banks with the efficiency value closest to optimum value are Bank Muamalat Indonesia, Bank Syariah Mandiri and Bank BRI Syariah based on the assumption of CRS, VRS and Scale at 99 percent point, while the one with lowest efficiency is Bank BNI Syariah with mean value below 99 percent. In Pakistan, on average, the bank with efficiency value closest to the optimum efficiency is Al-Baraka Bank based on the assumption of CRS, VRS and Scale at 99 percent, while the one with the lowest ones are the Bank Islami Pakistan Limited and Meezan Islamic Bank Value based on VRS assumption, with efficiency value below 99 percent. However, based on CRS and Scale assumptions, Dubai Islamic Bank Pakistan Limited gets the lowest efficiency value. All good variables from fixed assets, personal costs, deposits, financing and other income to financial investment both partially or simultaneously affect significantly the efficiency value. The variable with the greatest effect on efficiency value is deposits, followed with financing, based on the existing samples.

Keywords: data envelopment analysis (DEA), constant return to scale (CRS), variable return to scale (VRS), Scale, full-fledged Islamic bank

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1. Introduction

The growth of Islamic financial industry is getting better in the world; it brings about business opportunity for various industries, particularly in the terms of sharia-compliant banking and capital market sector. In 2015, global Islamic financial industry consisted of sharia-compliant banking accounting for US\$ 1496.5 millions or 80 percent of total global Islamic financial asset, and *sukuk* (sharia-compliant bond) for US\$ 290.6 millions or 15.45 percent of total global Islamic financial asset. Islamic funds asset account for US\$ 71.3 millions or 3.79 percent of total Islamic global financial asset. *Takaful* accounts for US\$ 23.2 millions or 1.24 percent of total global Islamic financial asset. A more detailed representation of Islamic financial asset development throughout the world has been given further.

TABLE 1: Assets of Islamic finance segments by region (US\$ billion, 2015).

REGION	Banking Assets	Sukuk Outstanding	Islamic Funds Assets	Takaful Contributions
Asia	209.3	174.7	23.2	5.2
GCC	598.8	103.7	31.2	10.4
MENA (Exc. GCC)	607.5	9.4	0.3	7.1
sub-Saharan	24.0	0.7	1.4	0.5
Africa				
Others	56.9	2.1	15.2	-
TOTAL	1496.5	290.6	71.3	23.2

Source: IFSI Stability Report, 2016

From Table 1, it can be seen that sharia-compliant banking industry contributes more to sharia-compliant financial industry. It is indicated with the size of sharia-compliant banking asset contributing most considerably to the total global sharia-compliant financial asset, that is, 80 percent. Meanwhile, MENA region states have highest sharia banking asset, US\$ 607.5 millions or 40.60 percent of total global sharia-compliant banking asset, followed by the GCC states with US\$ 598.8 millions USD or 40.02 percent and Asian states with US\$ 209.3 millions or 13.99 percent. The more detailed representation of sharia-compliant asset in some states can be seen further in Figure 1.

It can be seen from Figure 1 that Indonesia has sharia-compliant banking asset relatively equal to several other Asian states, including Pakistan, Egypt, Sudan, Bangladesh

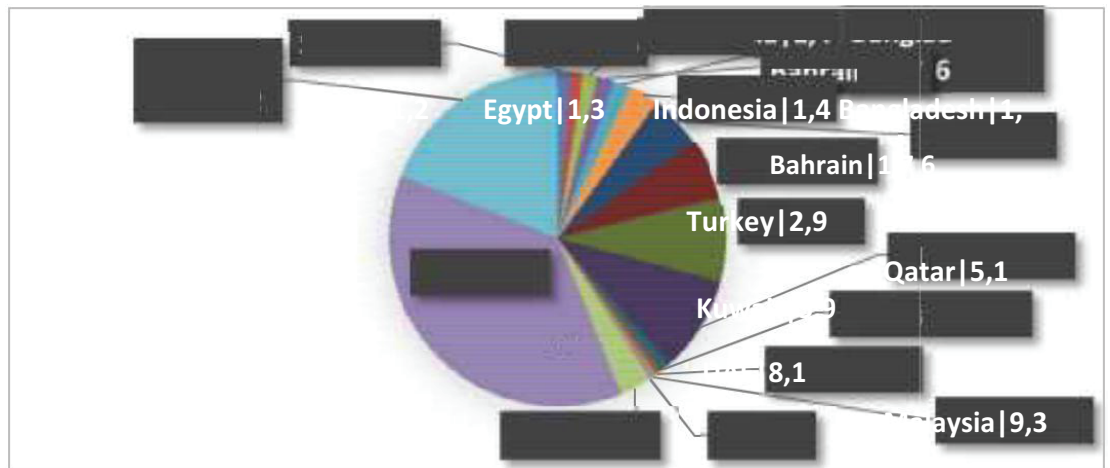


Figure 1: Proportion of global sharia-compliant banking asset by state. Source: IFSI Stability Report, 2016.

and Bahrain. It indicates that the share invested into sharia-compliant banking asset still tends to be minimal globally for those states.

Unfortunately, such states as Pakistan, Indonesia and Bangladesh have lower total sharia-compliant banking asset than Iran, Saudi Arabia and Malaysia. Meanwhile, Muslim populations in those countries are the highest ones in the world.

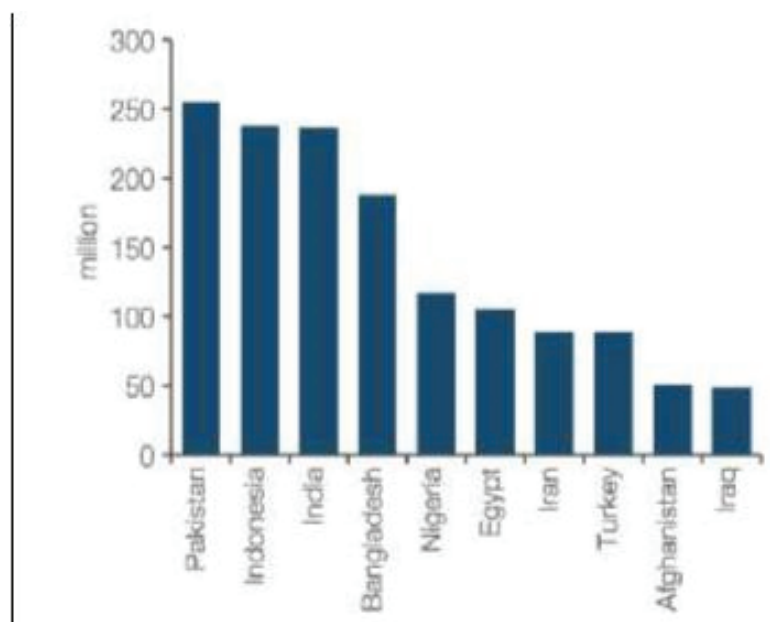


Figure 2: Predicted Muslim population (2030). Source: Islamic Finance for Asia, IFSB-ADB, 2015.

From the research conducted by Pew Research Center in IFSB-ADB, *Islamic Finance for Asia: Development, Prospects and Inclusive Growth* in 2015, it can be seen that Pakistan and Indonesia will predictably have the largest Muslim population, about 250 million people, in 2030.

Considering the aforementioned potency, the development of sharia-compliant financial industry, including sharia-compliant banking, will increase continuously. In 2023, the world sharia-compliant financial industry will predictably have assets up to US\$ 8.6 trillions. Even Indonesia is predicted to lead the world sharia-compliant financial industry in 2023 with total asset of US\$ 1.597 trillions.

Indonesia's sharia-compliant financial industry asset will be above Pakistan's, US\$ 1.388 trillions. The third position of the world sharia-compliant financial industry will be occupied by Bangladesh with total asset of US\$ 1.154 trillions. This prediction was presented in *Islamic Finance Intelligence Summit* in Kuala Lumpur on Tuesday (15/11) in *Republika* online news.

Considering the aforementioned prediction, Indonesia and Pakistan can be the *qibla* (direction or reference) to the world sharia-compliant economy. It is also confirmed by a sharia-compliant economy observer, Adiwarmarman Azwar Karim, in *Republika* on Wednesday (16/11), stating that there are two main factors for Indonesia to be the *qibla* of the world sharia-compliant economy: large population and human resource creativity. These two potencies are market-driven in nature.

Amid the global economic stress and uncertainty, the world sharia-compliant banking industry, particularly in Indonesia and Pakistan, is required to keep competitive. The tight competition in sharia-compliant banking, of course, requires the participants to have large asset, high market share, ability of improving the community economy by providing the finance accessible to lower-middle class in society, and to be an efficient institution/body.

The more efficient bank is expected to get an optimum profit, to get larger amount of loan and to provide better service quality to the customers. The problem of banking efficiency is the important thing both in the present and in the future. It is because of the tight competition, problem resulting from the reduced resource and the increased standard of customer satisfaction. This condition puts efficiency to be an important issue in the banking world (Suliyanto & Jati, 2014:298).

Operating expense ratio (OER) is used to measure a bank's efficiency level by comparing operational expense with revenue. However, viewing a banking industry as an intermediary institution using many inputs and outputs, the measurement of efficiency level using OER is considered as not representing a bank's efficiency level. It is because the calculation of efficiency level using OER is partial efficiency. In addition, the portion of weight in efficiency level calculation with CAMELS method, only 5 percent, attracts a distinctive attention moreover, recalling the urgency of efficiency-level measurement in representing a bank's performance (Firdaus & Hosssen, 2013: 170).

To deal with the weakness of ratio analysis in measuring a bank's performance, particularly in the term of efficiency, frontier approach is developed to measure the efficiency level of a company, in this case, a bank. One of the frontier approaches used to calculate a bank's efficiency is data envelopment analysis (DEA).

Data envelopment analysis calculates the efficiency value for all units of sharia-compliant banks. Data envelopment analysis is a procedure designed specifically to measure efficiency value using many inputs and many outputs, in which the combination of input and output cannot be done. This method has an advantage over parametric method. Its advantage is that through it, we can identify the unit used as reference (Firdaus & Hosssen, 2013:169).

Therefore, it is very important to conduct a research on the efficiency level of sharia-compliant banks in Indonesia and Pakistan, recalling these two countries' potency to be the *qibla* of sharia-compliant economy in the world in 2030.

This study is the expansion of previous studies, the ones conducted by Norlina Kadri, Rossazana Ab-Rahim, & Dyg Siti Zahrah Abg-Abdillah in 2016 entitled "*The Efficiency Performance of Global Islamic Banks*", Rahmat Hidayat in 2014 entitled "*Efisiensi Perbankan Syariah: Teori dan Praktik* (Efficiency of Sharia-Compliant Banking: Theory and Practice)", Abdul Wahab, Muhammad Nadratuzzaman Hosen, & Syafaat Muhari in 2014 entitled "*Komparasi Efisiensi Teknis BUK dan BUS di Indonesia dengan Metode Data Envelopment Analysis* (The comparison of Conventional Public Bank and Sharia-Compliant Bank technical efficiencies in Indonesia using Data Envelopment Analysis Method)". But, this study is different from the previous ones in which it analyses the efficiency levels of two states, the method used is non-parametric approach (DEA), output variable is modified and research object uses more update data, and the variable mostly affecting the efficiency is analysed using panel data regression.

2. Hypothesis

2.1. Independent t- and Mann Whitney tests

Ho: There is no significant difference of efficiency value in sharia-compliant public banks between Indonesia and Pakistan.

Ha: There is a significant difference of efficiency value in sharia-compliant public banks between Indonesia and Pakistan.

2.2. Factor affecting efficiency

2.2.1. The effect of fixed asset on efficiency

Ho: There is no significant effect of fixed asset on efficiency value.

Ha: There is a significant effect of fixed asset on efficiency value.

2.2.2. The effect of Third Party's fund on efficiency

Ho: There is no significant effect of Third Party's fund on efficiency value.

Ha: There is a significant effect of Third Party's fund on efficiency value.

2.2.3. The effect of labour cost on efficiency

Ho: There is no significant effect of labour cost on efficiency value.

Ha: There is a significant effect of labour cost on efficiency value.

2.2.4. The effect of other revenues on efficiency

Ho: There is no significant effect of other revenues on efficiency value.

Ha: There is a significant effect of other revenues on efficiency value.

2.2.5. The effect of costing on efficiency

Ho: There is no significant effect of costing on efficiency value.

Ha: There is a significant effect of costing on efficiency value.

2.2.6. The effect of financial investment on efficiency

Ho: There is no significant effect of financial investment on efficiency value.

Ha: There is a significant effect of financial investment on efficiency value.

2.2.7. The effect of fixed asset, labour cost, Third Party's fund, other revenues, costing and financial investment on efficiency

Ho: There is no significant effect of fixed asset, labor cost, Third Party's fund, other revenues, costing and financial investment on efficiency value.

Ha: There is a significant effect of fixed asset, labor cost, Third Party's fund, other revenues, costing and financial investment on efficiency value.

3. Method

By its explanation level, this research belongs to a comparative–associative (causal) study. A comparative study is a research form or method conducted to compare a variable (Supriyanto, 2009: 117); this current study compares efficiency value of sharia-compliant public banks in Indonesia and Pakistan. Associative (causal) study is the one conducted to find out the effect or the relationship between one variable and another (Supriyanto, 2009:118), in this case to find out the factors affecting the efficiency value of data processed using DEA. Hence, it can be said that this research, by its explanation level, is a combined comparative and associative causal study (Supriyanto, 2009:118).

This study employed a quantitative data analysis by processing input and output variable used in the research. Quantitative data is data in numerical form. In line with its form, quantitative data can be processed or analysed using statistic calculation technique (Siregar, 2013:23).

This research employed two analysis techniques: non-parametric method analysis technique, DEA, to analyse the efficiency value with Third Party's fund, labor cost and fixed asset being input variable and costing, other revenues and financial investment being output variable. Then, Mann Whitney variance test was conducted to compare the efficiency between the banks. Meanwhile, to see the factor affecting model efficiency value, panel data regression analysis technique was employed with Third Party's fund, labor cost, fixed asset, costing, other revenues and financial investment being dependent variable and efficiency value of DEA processing result being independent variable. The analysis software used in this research was DEA Frontier software to estimate the efficiency weight in DEA with Microsoft Excel and SPSS 17.00 help for data normality and variance tests, and Eviews 9.0 to find out the determinant of efficiency model.

Data source employed in this research was secondary data, the one obtained in the finished form, collected and processed by other parties, usually in publication

and documented form (Suryani, 2015:171). Data obtained derived Quarterly Financial Statement in 2012–2016 published by the official website of sharia-compliant bank being the sample of research.

The population of research consisted of 13 sharia-compliant public banks (thereafter called BUS) enlisted in Financial Service Authority in the 4th quarter of 2016 and 5 full-fledged Islamic banks enlisted in the State Bank of Pakistan in the fourth quarter of 2016. The sampling technique method employed in this research was non-probability sampling, the one not giving equal opportunity to every element or member of population to be selected as the sample. From various nonprobability sampling techniques, the author implemented the purposive sampling technique, the technique of selecting the sample based on certain criteria corresponding to the research objective (Sugiyono, 2007:66-67). The criteria of sampling in this research are as follows:

1. Sharia-compliant public bank operated in Indonesia and Pakistan enlisted in Financial Service Authority or Bank of Indonesia and Central Bank of Pakistan during observation period of 2012–2016, excluding Sharia-Compliant People Loaning Bank (BPRS) and Sharia Business Unit (UUS).
2. Presenting financial statement during observation period of 2012–2016 and published by Financial Service Authority and Central Bank of Pakistan and in official website of corresponding sharia-compliant public bank.
3. Included into top four with highest asset value in sharia-compliant public bank in Indonesia or full-fledged Islamic bank in Pakistan, as sharia-compliant public bank belonging to the top four with highest asset value can represent a half of the assets of the sharia-compliant public bank population in Indonesia and full-fledged Islamic bank population in Pakistan.
4. Not having negative value or weight in input and output variable in financial statement; it is a precondition of efficiency analysis with DEA.

Considering the specified criteria, eight representative samples were taken: four sharia-compliant public banks in Indonesia and four full-fledged Islamic bank in Pakistan.

4. Analysis and Discussion

4.1. Efficiency analysis using DEA method in Indonesia

Considering the CRS assumption approach, only few banks achieve optimum efficiency compared with those not achieving efficiency, or in other words, it is easier to obtain inefficient bank than the efficient one. Meanwhile, through VRS assumption approach, the number of efficient banks is larger than that of inefficient ones.

From Table 2, it can be seen that sharia-compliant public banks in Indonesia have the lowest efficiency (based on CRS assumption) occurring in the second quarter of 2014, in which no bank achieves the optimum efficiency level in this research. Then, the largest number of banks achieving the most optimum efficiency occurs in the first and the fourth quarter of 2012, and in the first quarter of 2016, in which all (sharia-compliant public) banks in Indonesia achieve the optimum efficiency in the current study.

Meanwhile, based on VRS assumption, there is only sharia-compliant public bank (Bank Muamalat Indonesia) with the lowest efficiency level in Indonesia, occurring in the fourth quarter of 2012. Then, the largest number of banks achieving the optimum efficiency occurring in all quarters of 2012, in the first quarter of 2013 and of 2014, the first, the second and the fourth quarters of 2016; so that it can be said that all sharia-compliant banks achieve the optimum efficiency in this current research.

Considering the result of research, it can be found that no sharia-compliant public bank achieves the optimum efficiency based on CRS, VRS and Scale assumptions. The banks mostly approaching optimum efficiency are Bank Muamalat Indonesia and Bank BRI Syariah, based on CRS, VRS and Scale assumption with 99 percent score, while the one with the lowest efficiency is Bank BNI Syariah scoring below 99 percent.

From Table 3, the author finds the average value of the four sharia-compliant public banks during the research period. The data of average efficiency level for sharia-compliant public banks in Indonesia with CRS, VRS and Scale efficiency assumption is presented further:

4.2. Efficiency analysis using DEA Method in Pakistan

Considering the CRS assumption approach, only very few banks achieve the optimum efficiency compared with those achieving inefficiency, or in other words, it is easier to find inefficient banks than the efficient ones. Meanwhile, through VRS assumption approach, the number of efficient banks is larger than that of inefficient ones.

TABLE 2: Sharia-compliant public bank in Indonesia achieving optimum efficiency with DEA method.

Period		Bank Code CRS*	Bank Number	Period		Bank Code VRS*	Bank Number
2012	Q1	1, 2, 3, 4	4	2012	Q1	1, 2, 3, 4	4
	Q2	2, 3, 4	3		Q2	1, 2, 3, 4	4
	Q3	2, 3, 4	3		Q3	1, 2, 3, 4	4
	Q4	1, 2, 3, 4	4		Q4	1, 2, 3, 4	4
2013	Q1	1, 2, 4	3	2013	Q1	1, 2, 3, 4	4
	Q2	2	1		Q2	1, 2, 4	3
	Q3	1	1		Q3	1, 2, 3	3
	Q4	2, 3, 4	3		Q4	2, 3, 4	3
2014	Q1	2, 3, 4	3	2014	Q1	1, 2, 3, 4	4
	Q2		0		Q2	1, 2	2
	Q3	4	1		Q3	2, 3, 4	3
	Q4	2	1		Q4	2	1
2015	Q1	1, 4	2	2015	Q1	1, 2, 4	3
	Q2	2, 4	2		Q2	2, 3, 4	3
	Q3	1, 2	2		Q3	1, 2	2
	Q4	4	1		Q4	3, 4	2
2016	Q1	1, 2, 3, 4	4	2016	Q1	1, 2, 3, 4	4
	Q2	2	1		Q2	1, 2, 3, 4	4
	Q3	1	1		Q3	1, 3, 4	3
	Q4	1, 2, 4	3		Q4	1, 2, 3, 4	4

Source: Data processed by author

Note*:

1: Bank Syariah Mandiri 3: Bank BNI Syariah

2: Bank Muamalat Indonesia 4: Bank BRI Syariah

Table 4 shows that the number of full-fledged Islamic banks with the lowest efficiency level in Pakistan (based on CRS assumption) occurs in the second quarter of 2012, second and third quarters of 2015, in which no sharia-compliant public banks achieves optimum efficiency level in the current study. Then, the largest number of banks achieving the optimum efficiency occurs in the fourth quarter of 2012, first

TABLE 3: Efficiency level of four sharia-compliant public banks in Indonesia.

Bank	CRS	VRS	Scale
Bank Syariah Mandiri	98.95%	99.57%	99.38%
Bank Muamalat Indonesia	99.41%	99.94%	99.47%
Bank BNI Syariah	94.60%	98.81%	95.74%
Bank BRI Syariah	99.22%	99.57%	99.65%
Average	98.05%	99.47%	98.56%

Source: Data processed by the author

and fourth quarter of 2014, meaning that all sharia-compliant public banks achieve optimum efficiency.

From Table 4, for VRS assumption approach, it can be seen that all sharia-compliant public banks achieve the lowest efficiency level in Pakistan in the second quarter of 2012, second and third quarter of 2015, meaning that no sharia-compliant public bank achieves optimum efficiency in Pakistan in this current study. The largest number of banks achieving optimum efficiency occur in the first quarter of 2012, first quarter of 2014 and fourth quarter of 2014, in which all bank achieve optimum efficiency in Pakistan in the current study. Based on the data presented in Table 4, the author finds the average value for the four sharia-compliant public banks during the research period. The result of data processing for efficiency level of full-fledged Islamic banks in Pakistan with CRS, VRS and Scale efficiency assumption is presented further.

From Table 5, it can be seen that no full-fledged Islamic banks in this study achieves optimum efficiency based on CRS, VRS and Scale assumptions. Meanwhile, the one mostly approaching the optimum efficiency is Al-Baraka Bank with 99 percent level based on CRS, VRS and Scale assumptions, and the ones with the lowest level are Bank Islami Pakistan Limited and Meezan Islamic Bank with score below 99 percent based on VRS assumption. However, compared with CRS and Scale assumptions, the bank with the lowest value is Dubai Islamic Bank Pakistan Limited, because it gets the lowest value compared to the other three banks.

TABLE 4: Full-fledged Islamic banks achieving optimum efficiency in Pakistan using DEA method.

Period		Bank Code CRS*	Bank Number	Period		Bank Code VRS*	Bank Number
	Q1	1, 4	2		Q1	1, 4	2
2012	Q2		0	2012	Q2		0
	Q3	1, 2	2		Q3	1, 2	2
	Q4	1, 2, 3, 4	4		Q4	1, 2, 3, 4	4
	Q1	1, 3, 4	3		Q1	1, 3, 4	3
2013	Q2	1, 3, 4	3	2013	Q2	1, 3, 4	3
	Q3	1, 2, 4	3		Q3	1, 2, 4	3
	Q4	2, 3, 4	3		Q4	2, 3, 4	3
2014	Q1	1, 2, 3, 4	4	2014	Q1	1, 2, 3, 4	4
	Q2	1, 3	2		Q2	1, 3	2
	Q3	1, 3	2		Q3	1, 3	2
	Q4	1, 2, 3, 4	4		Q4	1, 2, 3, 4	4
	Q1	1	1		Q1	1	1
2015	Q2		0	2015	Q2		0
	Q3		0		Q3		0
	Q4	1, 3	2		Q4	1, 3	2
	Q1	1, 2, 4	3		Q1	1, 2, 4	3
2016	Q2	2, 3, 4	3	2016	Q2	2, 3, 4	3
	Q3	1	1		Q3	1	1
	Q4	1, 3, 4	3		Q4	1, 3, 4	3

Source: Data processed by the author

Note*:

1: Al-Baraka Bank 3: Dubai Bank Islamic Pakistan L

2: Bank Islami Pakistan Limited 4: Meezan Islamic Bank

4.3. Total potential improvement of Sharia-compliant public banks in Indonesia and Pakistan

The result of DEA calculation also reveals the potential improvement that can be done by the banks not operating efficiently yet. Considering an input-oriented intermediary approach, it can be concluded that majority sharia-compliant public banks in Indonesia

TABLE 5: Efficiency level of four full-fledged Islamic banks in Pakistan.

Bank	CRS	VRS	Scale
Al-Baraka Bank	99.35%	99.83%	99.52%
Bank Islami Pakistan Limited	95.70%	98.45%	97.21%
Dubai Islamic Bank Pakistan Limited	94.99%	99.03%	95.92%
Meezan Islamic Bank	95.83%	98.26%	97.53%
Average	96.47%	98.89%	97.54%

Source: Data processed by the author

and Pakistan should reduce its total input and increase its output all at once to yield an ideal output by DMU.

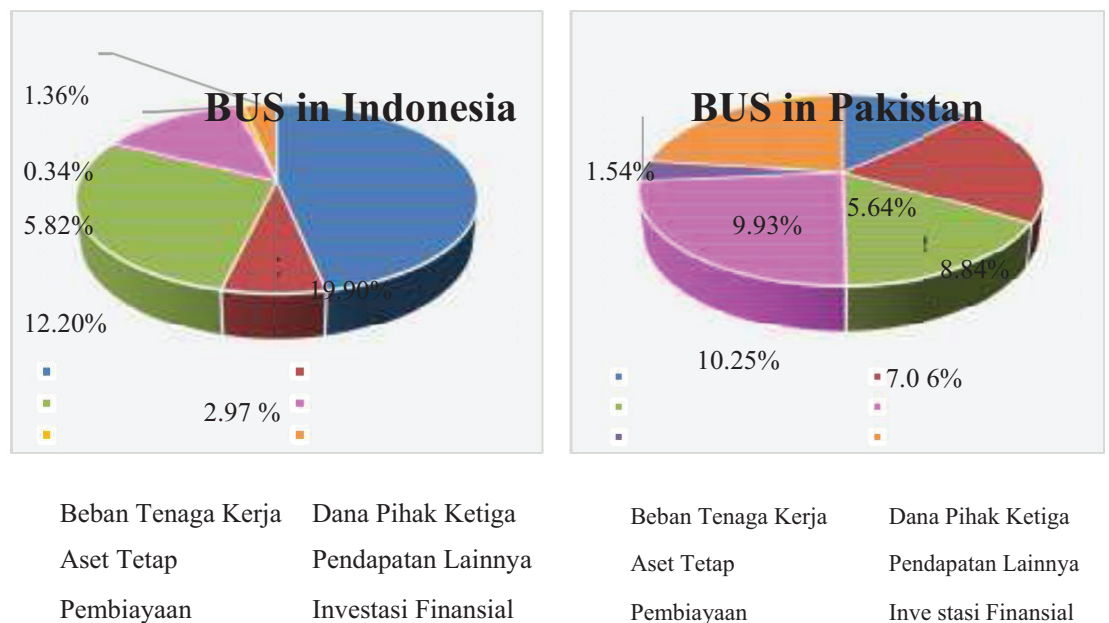


Figure 3: Total potential improvement of sharia-compliant public banks (BUS) in Indonesia and Pakistan. Source: Data processed from Target Input-oriented DEA Frontier.

Notes:

■ Labour cost	■ Third party's fund
■ Fixed asset	■ Other revenues
■ Costing	■ Financial investment

Figure 3 shows that total improvement (variable requiring improvement) occurs in input and output variables. Input variable includes labour cost, Third Party's fund and fixed asset. Meanwhile, the output variable needing attention includes: costing, other revenues and financial investment.

In Indonesia, the variable causing the largest inefficiency is labour cost (19.90%) and fixed asset (12.20%), while the variable causing efficiency is costing (0.34%). Next, in Pakistan, the variable causing the largest inefficiency is other revenues (10.25%), while the one causing efficiency is costing (1.54%).

The increase in labour cost is due to the expansive aggressiveness of sharia-compliant public banks. During expansion, the bank, of course, establishes new branch office and eventually there is an increase in human resource number. When the number of human resource increases, the cost also increases. Cost of training and education for human resource increases as well, because of limited number of sharia-compliant human resource viewed from supply aspect but the increased demand viewed from sharia-compliant industry (expansiveness). The management of sharia-compliant bank needs to make new innovation as to save labour cost and to maintain its effectiveness. When human resource reaches efficiency and effectiveness, it is not impossible to achieve the efficiency of labour cost currently still below 19.90 percent.

The less efficient other revenues deriving from fee-based income should get serious attention. The problem occurs only when it is still related to investment plan, for example, fee-based income is obtained from ATM service. Therefore, as long as the number of ATM is not increased, it will be difficult. However, increasing the number of ATM means spending much cost. To increase the fee-based income, input-output ratio should be taken into account. Generally, the increase in fee-based income is always related to technology use that can improve customer service. So, actually, the opportunity of improving fee-based income will be utilized more by a number of banks having advanced technology.

Surplus fixed asset occurs likely because of high expansiveness. The establishment of new branch, operational vehicle, ATM machine and etc. increases the long list of inefficiency, viewed from surplus fixed asset aspect. It can be actually dealt with or

minimized through good cooperation with its parent conventional bank to suppress the cost of fixed asset, for example, by optimizing office channelling, collective ATM strategy or new breakthrough of branchless banking in which the branch (subsidiary) has no physical office. In addition to saving fixed asset cost, sharia-compliant public bank can reach or can be closer to the potential customers, particularly unbankable customer and thereby financial inclusion can be achieved.

4.4. Mann Whitney variance test

Considering the result of data processing using SPSS 17.0 program with Kolmogorov Smirnov Normality test, it can be seen Asymp. Sig (2-tailed) of 0.000. It means that the data is not distributed normally, because Asymp. Sig (2-tailed) score is < 0.05 . Therefore, the statistic test for variance significance in this research was conducted using Mann Whitney U-Test.

The result of data processing using SPSS 17.0 also shows that efficiency value has significance level of 0.180 or higher than $\alpha = 0.05$, meaning that H_0 is supported and H_a is not supported, so that it can be concluded that there is no significant difference of efficiency value between sharia-compliant public banks in Indonesia and Pakistan.

4.5. Factors affecting efficiency (Two-stage DEA)

Considering the result of t -statistic test, the factors mostly affecting the efficiency level of sharia-compliant public banks in Indonesia and Pakistan are as follows:

4.5.1. The effect of fixed asset on efficiency level

Considering the result of t -test, it can be found that fixed asset affects

significantly the efficiency. This finding is in line with Firdaus and Hossen's (2013) study, finding that there is negative significant effect of fixed asset on efficiency, meaning that the more the fixed asset a bank has, the more inefficient is the bank in managing the resource it has. It is because sharia-compliant public banks in Indonesia have not reached economies of Scale yet and the increase in fixed asset number such as new branch opening or in ATM machine number will increase only the cost spent by sharia-compliant public bank. It is also consistent with potential improvement of DEA result, in which to achieve an efficient condition, a sharia-compliant bank should

decrease its surplus fixed asset number not used duly to improve the bank's efficiency and performance.

4.5.2. The effect of Third Party's fund on efficiency level

Considering the result of *t*-test, Third Party's fund affects significantly the efficiency. It is in line with Pambuko's (2016) study stating that the presence of Third Party's fund allocated to productive asset sector can affect the bank's efficiency. This indicates that there is a negative significant effect or in other words, the large the amount of Third Party's fund, the more inefficient is the bank in managing the resource it has. Such a condition means that when the Third Party's fund is larger, the bank's ability of changing its resource into productive assets such as costing and portfolio investment becomes inefficient. It is because the Third Party's fund is high and cannot be distributed well to productive assets, thereby leading to idle money, so that the bank's performance, in this case, fund allocation efficiency, will decrease. For that reason, Third Party's fund should be allocated efficiently to other sectors in order to improve the bank's efficiency. It is also in line with the potential improvement in DEA result, in which to achieve an efficient condition, sharia-compliant bank should reduce the Third Party's fund that can result in idle money, and should also increase the fund distributed and the investment in bonds (obligations).

4.5.3. The effect of labour cost on efficiency level

Considering the result of *t*-test, labour cost affects significantly the efficiency. It is in line with Dewi, Negoro and Rahmawati's (2017) study finding that there is a company's tendency to spend substantial labour cost, particularly in banking company that can affect the company's efficiency. Human resource is a non-physical asset inside individual/bank officers including knowledge, work ethos, skill, understanding and energy the individuals have to contribute all of their best to the bank's progress. In its implementation, the bank should usually allocate the fund for human resource development through education and training aiming to optimize the human resource potency in the bank. Human resource becomes the most important indicator that can contribute most considerably to a bank's financial performance, particularly its efficiency. When the bank spends labour cost of 50 percent, the improved bank performance can be seen from the increased income or the good fund distribution performance; therefore, it can be said that labour cost spent has been efficient to result in the bank's best

performance. However, the expensive investment spent by the bank is sometimes not comparable to the result (return) the bank receives (in this case, there is no improved performance) so that the bank encounters inefficiency in labour cost aspect. It is also consistent with the potential improvement resulting from DEA, in which to achieve an efficient condition, sharia-compliant banks should decrease the excessive amount of labour cost inconsistent with the target, in order to focus more on the human resource development that can improve the bank's efficiency or performance.

4.5.4. The effect of other revenues on efficiency level

Considering the result of *t*-test, other revenues affect significantly the efficiency. It is in line with Pambuko's (2016) study, finding that the increased revenue affects the efficiency of the bank. This study showed that there is a positive significant effect, or in other words, the higher the amount of other revenues the bank receives, the more efficient is the bank in allocating the profit to other sector. It means that when the amount of other revenues is higher, the bank's ability of managing the fund in other sectors is more efficient. It is because other revenues usually derive from fee-based income that can derive from the use of technology or service offered by the bank. In addition, the bank with fee-based income or the large income will automatically be indicated as the efficient bank as the bank can result in profit from the resource it has managed. It is also consistent with the potential improvement resulting from DEA, in which to achieve an efficient condition, sharia-compliant banks should increase the amount of other revenues as targeted, so that when the amount of other revenues is increased, the bank will be efficient.

4.5.5. The effect of costing on efficiency level

Considering the result of *t*-test, costing affects significantly the efficiency. It is in line with Pambuko's (2016) and Rakhmat Hidayat's (2014) studies finding that the presence of costing resulting from the allocation of Third Party's fund can contribute to the bank's efficiency. This finding indicates that there is a positive significant effect, or in other words, the higher the amount of costing distributed, the more efficient is the bank in allocating the resources it has. It means that, when the costing is higher, the bank's ability of making the resource, the costing, is more efficient. It is because the high costing results in high profit, so that the bank's performance, in this case the efficiency of fund allocation, will be good. It is also consistent with the potential improvement

of DEA result in which to achieve the efficient condition, sharia-compliant bank should improve the amount of costing allocated to society productively as targeted; thus, when the costing amount is increased, the efficient bank will result from intermediary aspect.

4.5.6. The effect of financial investment on efficiency level

Considering the result of *t*-test, it can be found that financial investment affects significantly the efficiency. It is in line with Pambuko's (2016) and Firdaus and Hosen's (2013) study finding that an investment in bonds (obligations) can affect the efficiency of a bank. It is because the largest amount of investment in bonds (obligations) will automatically make the adoption of new technology easier that can increase profit gain and minimize the management cost. In other words, the higher the profit gained from bond (obligation) investment, the more efficient is the bank in managing its resource. It indicates that sharia-compliant banks that can result in higher profit from bond investment will operate efficiently. It is also consistent with the potential improvement of DEA result, in which to achieve the efficient condition, sharia-compliant bank should increase bond investment that has good potency in the future, thereby improving the bank's efficiency or performance.

Considering the result of research, it can be concluded that all independent variables affect significantly the dependent variable. Fixed asset, labour cost, Third Party's fund, other revenues and financial investment affect significantly the efficiency in this model. Meanwhile, the variable with larger effect on efficiency is Third Party's fund at significance level of 0.0000 and coefficient value of -0.225789, meaning that this variable affects 22.58 percent of efficiency in this model, followed by costing at significance level of 0.0000 and coefficient value of 0.140358, meaning that it affects 14.03 percent of efficiency in this model.

It is in line with the approach used by the author in determining the efficiency value with DEA, because basically bank should be efficient intermediary in undertaking its function of managing the fund collected and distributed, so that through this model, the bank as an intermediary institution is required to be able to distribute fund to other sectors, so that the Third Party's fund does not become only idle money.

5. Conclusion and Recommendation

5.1. Conclusion

Considering the result of research, the following conclusions can be drawn:

- a. Sharia-compliant public banks in Indonesia are more efficient than those in Pakistan, according to CRS, VRS and Scale assumptions; but there is a significance difference of efficiency value between sharia-compliant public banks in Indonesia and those in Pakistan. The mean value closest to the optimum efficiency (99%) in Indonesia occurs in Bank Muamalat Indonesia, Bank Syariah Mandiri and Bank BRI Syariah based on CRS, VRS and Scale assumptions, while the lowest one (below 99%) occurs in Bank BNI Syariah. Meanwhile, the mean value closest to optimum efficiency (99%) in Pakistan occurs in Al-Baraka Bank based on CRS, VRS and Scale assumptions, while the lowest one (below 99%) occurs in Bank Islami Pakistan Limited dan Meezan Islamic Bank, based on VRS assumption. However, based on CRS and Scale assumptions, the lowest value occurs in Dubai Islamic Bank Pakistan Limited, as the value gained is the lowest one compared with the other three banks.
- b. Based on the factors affecting efficiency, it can be concluded that all variables (fixed asset, labour cost, Third Party's fund, other revenues and financial investment) affect significantly the efficiency. The variable with the larger effect on efficiency is Third Party's fund, followed by Costing, based on the existing sample. Therefore, there should be a good policy, either internal to the bank and from the regulator, comprehensively improving the efficiency of sharia-compliant bank, thereby resulting in the acceleration in the sharia-compliant banks in the two states and making the two states the *qibla* of sharia-compliant economy in the world in 2030.

5.2. Recommendation

Considering the result of research and aforementioned conclusion, the author tries to suggest the following implications:

- a. To academicians, the object of research used should be more than four (maybe 10 or more) sharia-compliant public banks. Similarly, the research period should be renewed in order to get a result that can explain various phenomena occurring related to the study. The study can also compare with other states, or the object of research can include all South East Asian countries in order to be more

comprehensive. In addition, the analysis instrument used can be parametric analysis methods such as Stochastic Frontier Analysis (SFA). Through this analysis method, the author can analyse the efficiency of sharia-compliant bank using cost efficiency approach, so that the efficiency level based on the cost spent by the bank can be found. Meanwhile, for the two-stage method, Tobit Regression analysis method can be used to see the environment (external) factors affecting the efficiency value.

- b. To the management of sharia-compliant bank, there should be an internal bank's good control and strategy over the asset of sharia-compliant banks; a competitive marketing and product innovation strategy is required, in terms of fund collection and fund distribution products; a strategic management of human resource (HR) is required as well, for example, by applying multi-specialization AO. In addition, efficiency should be made by means of transformation to digital, core banking, etc.; branchless banking strategy should be applied in order to improve the efficiency so that the bank can distribute its fund to unbankable customers effectively. A stronger cooperation between office channelling and banking technology to suppress the cost of fixed asset can be a solution; joint or sharing operation should be established, in the terms of ATM and VSAT facility use and disaster recovery centre.
- c. To Government/Regulator, Standard Minimum Fund Personnel should be applied appropriately by means of solving it collectively involving practitioners, academicians and regulator in order to create link and match, so that the limited number of reliable workers in sharia-compliant finance can be solved; sharia-compliant financial literacy and sharia-compliant financial product utility should be improved, by remaining to maintain the cooperation with organizations operating in sharia-compliant financial scope to help improve sharia-compliant financial literacy in lower-, middle- and upper-classes of society. In addition, Financial Service Authority can develop video learning related to sharia-compliant finance that can be played in public places such as KRL, airport, bus terminal, busway, etc.; Financial Service Authority and State-Owned Enterprises Minister (*Kementerian BUMN*) can synergize the red-plate sharia-compliant banks in order to have their own switching company, just like its parent bank, so that the ATM operating system can be managed completely by the transaction transferring company belonging to the state-owned enterprises (BUMN), PT. Jalin Pembayaran Nasional (JPN).

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