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ANALYSIS OF THE EFFICIENCY OF ISLAMIC BANKING PERFORMANCE IN INDONESIA

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ABSTRACT
This study aims to determine the level of performance efficiency and sensitivity of each variable to the value of performance efficiency in Islamic banking in Indonesia. The method used is the Super Efficiency DEA method, which is a development of the Data Envelopment Analysis (DEA) method to rank each DMU. The purposive sampling technique used resulted in 7 DMUs from Islamic commercial banks that were sampled in this study. There are two kinds of variables used, namely input variables and output variables. Input variables consist of deposits, total assets, and general administrative expenses. Output variables consist of financing, operating income, and investment. The determination of these variables is done through an intermediation approach. The results of this study show that five banks achieve an efficient level; the one with the highest average efficient value is Bank Victoria Syariah at 398.52%. The banks that have yet to reach the efficient level are Bank Muamalat Indonesia at 81.73% and Bank Syariah Indonesia at 69.06%. In addition, the efficiency value of Islamic commercial bank performance is very sensitive to all input variables, namely deposits, total assets, and general administrative costs. While, in the output variable, the performance efficiency value is very sensitive to the financing variable and quite sensitive to the operating income and investment variable.

Keywords: Sharia Banking, Efficiency, DEA Sensitivity, Super Efficiency

INTRODUCTION

The financial institution industry is very important for the country's economic growth, especially in the banking sector. As an intermediary institution that has a role in collecting and distributing funds to the community, banking can support national development in a country (Maula & Jaya, 2022). Thus, banking is currently one of the needs of the community in terms of financial services and transactions (Monica Sari et al., 2020).

In recent years, the Islamic banking industry has experienced a fairly dynamic, fast, and competitive development. This can be seen from the increasing number of Islamic banking office networks in Indonesia, such as Sharia Commercial Banks until 2021, amounting to 500 office networks (Otoritas Jasa Keuangan, 2021). Therefore, the development of Islamic banking in Indonesia, the competition in the banking world is also getting tighter.

The most important aspect that must be considered by the Islamic banking industry in facing competition with conventional banking is to know the level of efficiency to be a benchmark for whether a bank has good financial performance or not because a bank that has good financial performance does not necessarily mean that the bank has good performance efficiency as well (Jaya & Kholilah, 2020). However, if a bank has good performance efficiency, it will have good financial performance.

In addition, according to Radojicic, efficiency measurement is very important for the banking industry in developing countries compared to developed countries, because of the cost of the efficiency gap (Kamel et al., 2021). So that from performance efficiency measurement, Islamic banking can find out what needs to be improved to achieve efficiency value and is expected to help the economy and public welfare. With information about the company's activities or performance efficiency, it will also increase stakeholder trust (Oktaviana et al., 2021)

A company can be said to be efficient if it is able to produce maximum output with certain inputs or by producing a certain number of outputs with minimal inputs, and companies must be able to maximize the use of inputs in accordance with a predetermined budget (Amirillah, 2014).

There have been several previous studies examining efficiency in Islamic banking. First, research conducted by Rusydiana & Hasib (2020) and Meruni Sani Putri & Mulazid (2015) found that the overall level of efficiency of Islamic banking is in an efficient condition. Meanwhile, research conducted by Monica Sari et al., (2020) and Amirillah (2014) shows that Islamic banking has not achieved a perfect level of efficiency. In addition, Setyono et al., (2021), Islamic banking has decreased efficiency caused by the Covid 19 pandemic.

The method that researchers often use to measure efficiency is the Data Envelopment Analysis (DEA) method. However, according to Anderson and Petersen (1993), the DEA method still has shortcomings, namely not being able to find out the best rank of the Decision Making Unit (DMU) if there is the same DMU value that is valued at 1, then the concept of super efficiency is introduced which can find out the efficiency value of DMU more than 1 or 100% (Rusydiana & Hasib, 2020). After calculating the performance efficiency value using DEA super efficiency, it will continue to analyze the sensitivity of each input and output variable to the relative value of performance efficiency in each DMU.

LITERATURE REVIEW

Sharia Banking

Islamic banking is a financial institution that has the function of collecting funds from the public in the form of deposits and investments and distributing them to people who need funds (Jaya, 2020). In general, investments are made in sales and purchase contracts and business cooperation, rewards or profits obtained in the form of profit sharing margins or in other forms in accordance with Islamic law. In addition, Islamic banks also provide financial transaction services to meet the needs of the community in carrying out their activities (Ismail., 2011).

Performance Efficiency

According to Syafaroedin, a company can be efficient if it can produce the same output as other companies but uses fewer inputs or produces more output with the same inputs as other companies (Rahmi & Putri, 2019). While performance is a matter related to the strength and weakness of a company. Companies can take advantage of their strengths, while their weaknesses can be used as a benchmark for improvement in the future (Asiyah, 2014). Therefore, measuring the efficiency of banking performance is very useful for determining the health and growth of banks in Indonesia.

Super Efficiency DEA

Super Efficiency DEA is a development technique from the Data Envelopment Analysis (DEA) analysis method where this method has a wider range of efficiency values so that a more comprehensive ranking sequence of each research object can be known (Kaban & Setyawati, 2020). According to Andersen, P. and Petersen (1993), the basic concept of Super Efficiency DEA is the existence of a DMU efficiency value of more than 1 or 100%. In addition, inefficient units or DMUs will not be affected because the efficiency is smaller than 1 or 100% (Rusydiana & Hasib, 2020)

DEA sensitivity

DEA sensitivity is used to study the effect of changes in model parameters on optimal solving. DEA sensitivity analysis was performed to measure the degree of influence of variables on their relative efficiency values. The analysis can show how much the DMU is affected if one of the variables is left out. Therefore, this sensitivity analysis was carried out through a simulation process using the Super Efficiency DEA VRS model (Rusydiana & Hasib, 2020).

METHODS

This research uses quarterly data from 2017 quarter I to 2021 quarter III with 7 Sharia Commercial Banks as the objects to be studied. The method used in this study is the DEA super efficiency method which is a development of the Data Envelopment Analysis (DEA) method. The DEA method is a nonparametric method that does not require initial assumptions and does not have random errors from the production function so that errors in the specification of the production function can be eliminated (Awaluddin et al., 2019).

The DEA method has several advantages compared to other research methods, namely (Awaluddin et al., 2019): (1) The DEA method can measure the relative efficiency of the same few Economic Activity Units (UKES) using multiple inputs and outputs; (2) Economic Activity Unit compared directly with its kind; (3) Using this method, there is no need to look for the assumed form of the function of the relationship between the input and output variables of the same UKE to measure its efficiency; (4) The input and output factors have different units of measurement without changing the units of the two variables.

In addition, the DEA method also has disadvantages, including: (1) The DEA method is an extreme point, so errors in measuring efficiency can cause significant problems; (2)This method can only show the good and bad of a UKE compared to similar UKE (relatively). However, it cannot rank each DMU; (3) Because DEA is a non-parametric technique, statistical hypothesis testing cannot be performed.

In the DEA method, there are two variables, namely input and output variables. The input variable consists of deposits, total assets, and general administrative expenses, while the output variable consists of financing, operating income, and investment. The measurement of the efficiency level of this Sharia commercial bank uses EMS (Efficiency Measurement System) software version 1.3 and Microsoft Excel so that researchers do not calculate manually.

RESULTS AND DISCUSSION

Performance Efficiency Value Analysis

In measuring the performance efficiency value of each Sharia Commercial Bank in Indonesia, which can be seen in Table 1, it is found that 5 DMUs have met the efficient value consisting of BVS, BPDS, BMS, BCAS, and BJBS, and 2 DMUs have not met the efficient value, namely BMI and BSI.

Among the 7 BUS that became DMUs in this study, the one with the highest overall average value was BVS (Bank Victoria Syariah), with a relative performance efficiency value of 398.52%, followed by BPDS (Bank Panin Dubai Syariah) at 249.55% and BMS (Bank Mega Syariah) at 228.83% and then followed by BCAS at 114.78%, BJBS at 110.84%, BMI at 81.73%, and BSI at 69.06%.

The average efficiency value of Islamic bank performance, in general, is 179.05%, which means that Sharia Commercial Banks in Indonesia are in an efficient state, even though there are 2 DMUs with inefficient values. The following is a table of the average value of DEA of Sharia Commercial Banks in Indonesia for the 2017-2021 period.

Judging from the development of the variables used in this study, the five efficient banks, namely Bank Victoria Syariah, Bank Panin Dubai Syariah, Bank Mega Syariah, Bank BCA Syariah, and Bank Jabar Banten Syariah, tend to experience an increase in variables every quarter. While the two banks have inefficient values, the development of variables tends to fluctuate every quarter. This greatly affects the results of the efficiency value of each bank's performance.

Table 1. Average Value of Super Efficiency DEA BUS in Indonesia 2017-2021

Bank	Period					Mean	Rank
	2017	2018	2019	2020	2021		
BMI	76.72%	76.89%	84.01%	92.00%	79.05%	81.73%	6
BVS	705.39%	492.14%	350.62%	291.23%	153.24%	398.52%	1
BSI	89.17%	85.09%	90.27%	80.76%	79.89%	69.06%	7
BPDS	141.60%	150.87%	213.27%	337.24%	404.78%	249.55%	2
BMS	131.62%	188.59%	190.02%	307.32%	326.60%	228.83%	3
BCAS	140.57%	102.31%	100.89%	107.63%	122.52%	114.78%	4
BJBS	165.03%	115.01%	100.55%	79.09%	94.52%	110.84%	5
Mean						179.05%	

Source: processed data, 2022

DEA Sensitivity Analysis

DEA Sensitivity Analysis is carried out by comparing the relative efficiency value with the efficiency value of the simulation results. If there is a small change in the variable causing the efficiency value to change as well, then the performance efficiency value is very sensitive to the variable's value. Conversely, if the change in variables does not affect the performance efficiency value, then the efficiency value is insensitive to the variable value.

Table 2. The sensitivity value of the input

Bank	Relative Efficiency	Mean		
		without I1	without I2	without I3
BMI 2017	76.72%	64.72%	40.33%	42.65%
BVS 2017	705.39%	225.45%	598.41%	556.91%
BSI 2017	89.17%	74.46%	43.88%	48.22%
BPDS 2017	141.60%	119.33%	80.57%	75.12%
BMS 2017	131.62%	99.53%	59.56%	83.70%
BCAS 2017	140.57%	120.97%	83.19%	64.64%
BJBS 2017	165.03%	98.47%	75.48%	121.17%
BMI 2018	76.89%	65.93%	41.62%	44.67%
BVS 2018	492.14%	185.16%	403.57%	460.50%
BSI 2018	85.09%	75.78%	113.50%	112.45%
BPDS 2018	150.87%	137.73%	86.41%	77.60%
BMS 2018	188.59%	159.51%	80.75%	125.24%
BCAS 2018	102.31%	83.93%	57.48%	56.70%
BJBS 2018	115.01%	60.51%	53.91%	86.94%
BMI 2019	84.01%	75.65%	41.66%	50.59%
BVS 2019	350.62%	154.18%	532.96%	589.47%
BSI 2019	90.27%	77.87%	51.03%	50.03%
BPDS 2019	213.27%	182.04%	132.16%	112.32%
BMS 2019	190.02%	158.24%	87.51%	131.49%
BCAS 2019	100.89%	85.97%	57.06%	54.08%

Bank	Relative Efficiency	Mean		
		without I1	without I2	without I3
BJBS 2019	100.55%	54.44%	51.52%	78.71%
BMI 2020	92.00%	74.36%	51.73%	48.29%
BVS 2020	291.23%	134.03%	458.48%	512.07%
BSI 2020	80.76%	69.95%	42.37%	43.67%
BPDS 2020	337.24%	170.86%	254.38%	202.02%
BMS 2020	307.32%	172.65%	202.61%	205.18%
BCAS 2020	107.63%	87.39%	61.90%	58.84%
BJBS 2020	79.09%	51.07%	43.80%	60.28%
BMI 2021	79.05%	64.86%	44.55%	44.74%
BVS 2021	153.24%	120.71%	102.07%	76.95%
BSI 2021	79.89%	72.21%	43.38%	43.89%
BPDS 2021	404.78%	151.26%	303.75%	311.58%
BMS 2021	326.60%	142.18%	239.71%	244.23%
BCAS 2021	122.52%	108.24%	77.68%	57.17%
BJBS 2021	94.52%	64.52%	56.42%	68.11%

Source: processed data, 2022

In Table 2, which contains the results of the sensitivity value of input variables, it can be seen that all input variables consisting of deposits, total assets, and general administrative costs are very sensitive to the value of relative efficiency. This is because the performance efficiency value of the simulation results all changes either greater or smaller than the relative performance efficiency value.

Table 3. The Sensitivity Value of the Output

Bank	Relative Efficiency	Mean		
		without IO	without O2	without O3
BMI 2017	76.72%	72.13%	70.28%	76.72%
BVS 2017	705.39%	705.39%	705.39%	266.85%
BSI 2017	89.17%	88.19%	50.00%	85.46%
BPDS 2017	141.60%	113.54%	121.33%	141.60%
BMS 2017	131.62%	131.62%	49.87%	126.15%
BCAS 2017	140.57%	138.03%	72.38%	140.54%
BJBS 2017	165.03%	164.51%	24.13%	165.03%
BMI 2018	76.89%	69.26%	74.16%	75.24%
BVS 2018	492.14%	460.50%	492.14%	271.22%
BSI 2018	85.09%	83.47%	54.94%	83.77%
BPDS 2018	150.87%	83.17%	150.87%	150.87%
BMS 2018	188.59%	188.59%	46.63%	186.96%
BCAS 2018	102.31%	87.40%	84.70%	102.31%
BJBS 2018	115.01%	113.33%	29.24%	115.01%

BMI 2019	84.01%	84.01%	82.98%	61.57%
BVS 2019	350.62%	589.47%	593.22%	225.15%
BSI 2019	90.27%	88.72%	61.24%	87.52%
BPDS 2019	213.27%	93.86%	213.27%	213.27%
BMS 2019	190.02%	190.02%	49.23%	190.02%
BCAS 2019	100.89%	89.87%	75.69%	99.53%
BJBS 2019	100.55%	98.04%	42.13%	100.54%
BMI 2020	92.00%	84.79%	92.00%	53.03%
BVS 2020	291.23%	512.07%	541.23%	177.71%
BSI 2020	80.76%	75.97%	65.58%	66.79%
BPDS 2020	337.24%	85.61%	337.24%	337.24%
BMS 2020	307.32%	307.32%	183.35%	267.68%
BCAS 2020	107.63%	88.25%	101.74%	88.72%
BJBS 2020	79.09%	72.57%	62.57%	76.62%
BMI 2021	79.05%	59.55%	79.05%	58.67%
BVS 2021	153.24%	124.72%	153.24%	105.77%
BSI 2021	79.89%	72.59%	57.05%	79.89%
BPDS 2021	404.78%	88.88%	404.78%	404.78%
BMS 2021	326.60%	326.60%	262.47%	261.39%
BCAS 2021	122.52%	95.06%	114.17%	119.03%
BJBS 2021	94.52%	83.74%	67.55%	94.52%

Source: processed data, 2022

While in table 3 which describes the results of the sensitivity value of the output variable, it can be seen that the column shaded in gray is the value of the simulation results that are insensitive to the relative efficiency value, meaning that the value of the variable does not affect the performance efficiency value. Output variables that are very sensitive to the value of relative performance efficiency are financing variables (O1), and variables that are quite sensitive to the value of performance efficiency are operating income (O2), and financial investment (O3). Regarding the use of variable financing and operating income in measuring the efficiency of Islamic banks in Indonesia, relatively many studies use it. Among them are Jajang Badruzaman (2019), Sari, et al (2020), Pratikto & Sugianto (2011), Rusydiana (2019), Rusydiana &; Hasib (2020), and Kaban &; Setyawati (2020). Thus, input and output variables that need to be considered in an effort to increase the efficiency of Sharia Commercial Banks in Indonesia are all input variables consisting of deposits (I1), total assets (I2), and general administrative costs (I3), as well as financing (O1).

CONCLUSION

The performance efficiency value of each Islamic commercial bank in Indonesia, using quarterly data measured using the DEA Super Efficiency method, can be concluded as follows: The results of the DEA super efficiency test state that Sharia Commercial Banks in Indonesia are in an efficient condition. However, the efficiency value of the performance of each DMU tends to fluctuate every year. This can be seen in the average value each year. From the sensitivity research that has been conducted, it can be said that the efficiency value of Sharia Commercial Bank performance for the 2017-2021 period is very sensitive with all input variables, namely deposits (I1), total assets (2), and general administrative costs (I3). Meanwhile, the variable output variables that are very sensitive to

the efficiency value of Sharia Commercial Bank performance for the 2017-2021 period are financing variables (O1) and are quite sensitive to operating income (O2) and financial investment (O3) variables.

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