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Efficiency Analysis of Sharia Commercial Banks (BUS) In Indonesia During 2015 – 2019

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Abstract

Research purposes to analyze the efficiency of Islamic Commercial Banks in Indonesia during the period 2015 – 2019. The object of this research is Sharia Commercial Banks consisting of Bank Mua-malat, BRI Syariah Bank, Mega Syariah Bank, Bukopin Syariah Bank, BNI Syariah Bank and BCA Sya-riah Bank. This study uses the Data Envelopment Analysis (DEA) method. The input variables used in this study are total assets, savings and other operational costs, while the output variables used are securities owned and other operating income. The results of the study show that BRI Syariah Bank and BNI Syariah Bank are inefficiency or inefficient, apart from these banks, namely Bank Muamalat, Bank Mega Syariah, Bank Syariah Bukopin, and Bank BCA Syariah are all efficient. The results of this study are expected to be able to contribute both theoretically and practically in increasing the effi-ciency of Islamic commercial banks.

Keywords: Efficiency, Total Assets, Islamic Commercial Banks, DEA

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INTRODUCTION

The banking industry is an industry that has an important role for the growth and development of a country's economy and is one of the needs of the community (Putri & Rusmita, 2020) . According to Sari et al. (2020) The role of banking in the perspective of society now is also a lot of need for financial services in the form of deposits, distribution of funds and other services. Banking also plays an important role in Indonesia because it can grow the nation's economy. Nugraha (2013) said that Indonesian banking has the feel of economic democracy where its activities are carried out by the people, from the people and for the people with the aim of prosper-ing the people by using the principle of prudence.

The main function of Indonesian banking is to collect and distribute public funds. The function of banking is to support the implementation of national development with the aim of increasing equitable development, economic growth and national stability that focuses on the standard of living of the people (Nugraha, 2013). The position of banks in improving people's living standards is a strategic one, namely as a supporter of the smooth payment system, implementation of monetary policy and financial system stability (Nugraha, 2013).

Banks operating in Indonesia are divided into two types, namely conventional banks where banks run their business based on interest principles and Islamic banks where banks run businesses based on profit sharing principles (Amalia, 2013). According to Nurdin & Yusuf (2020) the existence of conventional banks is longer than Islamic banks which were first established in 1992 and then followed by the emergence of Islamic commercial banks. Islamic banks themselves must be able to set the right strategy in managing their funds in order to be able to compete and still gain public trust.

The advantages of Islamic banks compared to conventional banks can be seen during the global crisis around 2008, Islamic banks were able to survive and still display good performance. Good performance makes Islamic banks do not experience negative spreads as studied by conventional banks. In order to gain public trust, Islamic banks are competing to provide various forms of products, facilities and services so that people will feel comfortable (Amalia, 2013) . The impact of public trust will result in the development of the banking industry.

The development of the Islamic banking industry continues to experience a fairly rapid increase. Its development can be seen from financial indicators and fi-nancial ratios in Islamic banks (Ledhem & Mekidiche, 2020) . Based on data from the financial services authority for the period 2015 to December 2019 it can be seen that the total assets in table 1.1 are distributed by Islamic banks.

Table 1.1
Development of Islamic commercial bank assets in 2015 – dec 2019
(In million rupiah)

Bus name	2015	2016	2017	2018	2019
Bank Muamalat	57,802,661	55,851,770	61,785,967	57,274,676	50,408,985
BRI Syariah	24,239,170	27,693,406	31,546,275	38,480,749	43,112,706
BNI Syariah	22,995,377	28,314,175	34,828,327	41,053.167	49,954,163

Bus name	2015	2016	2017	2018	2019
Bank MEGA Syariah	5,564,667	6,166,649	7,013,401	7,333,238	8,022,758
Bukopin Islamic Bank	5,830.050	7,036.349	7,287,487	6,343,345	6,741,729
BCA Syariah	4,353,594	4,996.621	5.952.007	7,066.453	8,628,917

Source: OJK, 2021

The data in table 1.1 explains that the total assets of Islamic banking have fluctuated but there are also Islamic banks that continue to increase. The increase in total assets was due to public trust in these financial institutions. Public trust is very important in the banking world because it can increase growth and even development for banking itself. The Islamic banks that continue to experience an increase are BRI Syariah, BNI Syariah, Bank Mega Syariah and BCA Syariah, the four banks continued to experience an increase during the 2015 – 2019 period. This indicates that the four banks have managed and channeled their funds appropriately and well.

The progress of the national Islamic banking industry is also proven by the amendment of Law no. 7 of 1992 into Law no. 10 of 1998 concerning banking, which recognizes the existence of a Dual Banking System, namely a conventional system with a sharia system or profit sharing. The existence of this system has an impact on the position of Islamic banks in Indonesia getting stronger and the role of the government in regulating specifically in Law no. 21 of 2008 (Ledhem & Mekidiche, 2020). The progress and growth of financial institutions can be seen from how efficient a bank is in managing and distributing funds, ranging from savings funds, securities owned to operating income. The funds or assets are then used properly. The increase in funds and assets continues in Islamic banking, as shown in table 1.2.

Table 1.2

Development of deposits, income and securities owned by six Islamic Commercial Banks

(In million rupiah)

Indicator	2015	2016	2017	2018	2019
Savings	1,787,557	1,611.109	2,163,326	1,798,536	2,174.263
Operating income	1,733,411	2.268.135	1,897,079	2,515,890	2,043,912
Securities owned	9,643,599	13,786,697	18,247,659	31,083,574	32,551,420

Source: OJK, 2021

Based on the data table 1.2 explains that deposits continue to increase from year to year, while income fluctuates from 2015 to 2019 and securities owned al-ways increase even the increase is very high. This shows that the management of Islamic banking is still not good because the income is still fluctuating. Islamic bank-ing must continue to develop and innovate so that funds and assets can generate efficiency in banking itself.

Measurement of a banking performance through the company's efficiency in managing its assets. The ability to maximize the value of the inputs owned to create high output results, this is the achievement of a performance measure (Ramly & Hakim, 2017) . The efficiency level of a sharia bank shows that the ability of a bank to optimize all the resources owned by the bank and provide benefits to its customers. Bank efficiency is expected to get optimal profits and more

loans and bet-ter service quality (Rahmi & Putri, 2019). Banking efficiency is included in the optimization of banking performance which provides an overview of the optimal use of inputs to produce maximum output (Stewart et al., 2016). The effect of efficiency on banking will create a value of trust for customers. According to Burgstaller (2020) the impact of efficiency and good performance of banks will have a concern and focus on social and environmental aspects which will be added value for the company so as to foster the value of trust from the community.

Research by Karimah et al., (2016) said that in general sharia general banks in Indonesia have not been operating efficiently. Sulaeman et al. (2019) also men-tions that Islamic commercial banks are banks that have not been able to maximize the value of their output and inputs, thus making Islamic commercial banks ineffi-cient/inefficient. Putri & Rusmita (2020) also found that the cost efficiency of Islamic banking in the 2015-2018 period tends to be less efficient in controlling costs. In ad-dition, the results of research by Candra & Yulianto (2015) who found that FDR had a positive and significant relationship to the level of efficiency. Meanwhile, ROA, CAR, BOPO, PPAP and NPF proved to have no effect on the level of efficiency. However, it is different from the results of research by Ichsan et al. (2021) which found that BOPO had a negative and significant effect on financial performance as proxied by ROA. Then reinforced by the results of Hijriyani & Setiawan (2017) who found the results of the t-test that the BOPO ratio had a negative and significant ef-fect on profitability. However, the other three ratios, namely PPAP, NPF and FDR, do not have a significant effect on the profitability of Islamic Commercial Banks (BUS).

Riani & Hendrawan (2020) analyzes efficiency and examines the differences between the efficiency of Islamic banks and conventional banks in 2014-2018. The results of the study concluded that the efficiency of Islamic banks and conventional banks during the 2014 – 2018 period fluctuated. The results of the difference test in the Intermediation approach of CRS and VRS assumptions, as well as in the Pro-duction approach of the VRS assumption, there is no significant difference between the technical efficiency of Islamic banks and conventional banks, while the results of the different tests in the Production approach of the CRS assumption show that there is a significant difference between the level of technical efficiency in Islamic banks with conventional banks, where Islamic commercial banks are more efficient than conventional commercial banks. The research of Sari et al. (2020) aims to determine the efficiency of Islamic banking performance in Indonesia in 2014 - 2018 and to find out the Islamic perspective on efficiency. The results showed that based on measurements using the DEA method with the CRS approach of 4 foreign ex-change BUS in the 2014-2018 period. There are 2 banks in a certain year having an efficiency value of <81%, namely mega sharia bank 30.38% (inefficient) in 2014, bank muamalat 77.47% (medium efficiency) in 2018. The SFA method shows a mean efficiency of 0.3808 and there is only 1 bank that has high efficiency com-pared to the other three banks that fall into the inefficient category.

Based on the explanation above, the level of efficiency is a benchmark to see the health of Islamic banking financial statements and also good management in Islamic banking. The health of a banking financial report can be seen from the allocation of funds. Banking efficiency is something important that must be maintained properly so that people will put their trust in

Islamic banks, the more people believe, the faster the development of Islamic banking in Indonesia will be.

LITERATURE REVIEW

SYARIAH BANKING

Bank is a financial institution or company that is engaged in finance and pro-vides various financial services. Banks have the main activity, namely collecting funds from the public/customers and channeling these funds back to customers and providing other bank services (Ridwan et al. 2021). Islamic bank is a financial institution that operates as an intermediary for customers or parties who have excess funds with parties who lack funds, where their business activities are in accordance with Islamic law. Islamic banking or interest fee banking is a label for Islamic banks, namely a banking system in operational implementation that does not recognize or does not use the interest system, speculation and uncertainty or obscurity (Salim & Djausin, 2020).

BANK'S FINANCIAL PERFORMANCE

Performance is something that will produce a positive side for the institution. According to Putri & Rusmita (2020) performance is a periodic determination of the operational effectiveness of an organization and its employees based on conformity to the previous plan. Performance is the result obtained by an institution that is profit oriented or non-profit oriented which is produced during a predetermined period of time (Buallay et al., 2020).

The form of performance is divided into two types, namely operational performance and financial performance. Operational performance only focuses on the company's internal parties, for example branch or division performance which can be assessed through speed and discipline. Meanwhile, financial performance is de-fined as a form of the bank's financial condition in a certain period, both in terms of raising funds and distributing funds, which are usually measured by financial ratios (Karamoy & Tulung, 2020). According to Ali et al. (2020) financial performance can also be defined as a description of a prospect, growth and development potential that provides added value for the company.

Financial performance is an analysis to see how a company has used financial implementation rules properly and correctly (Dong et al., 2020). According to Pu-tri (2020) bank financial performance is a description of the bank's financial condition in one period or several periods, the bank's financial position and financial performance in the past in one period or year will be used as a reference to predict the bank's financial position and performance, then evaluated with a financial ratio analysis approach from each financial report that has been reported.

EFFICIENCY

Different definitions make the meaning of efficiency wider. efficiency can be interpreted as the ratio of the ratio between output and input (Majdina et al. 2019). Sutawijaya & Lestari (2009) divides three factors that cause efficiency, namely (1) the same input will produce a larger

output, (2) a smaller input will produce the same output and (3) a large input will produce a larger output as well.

Efficiency measured by the model according to Prieto & Zofio (2007) can be seen through two approaches, as follows:

a) Approach from Input point of view

This approach is used to answer some quantity of input that can be reduced proportionally to produce the same quantity of output. This approach is used when market conditions have experienced a saturation level so that the company needs to know about improving the efficiency of its existing resources.

b) Approach from the output point of view

This approach addresses how much the quantity of output can be increased as needed to produce the same quantity of input. This output approach is used when market conditions are still in good condition so that producers are expected to maintain or increase output with the same input.

BANKING EFFICIENCY

Efficiency in the banking industry is divided into two perspectives, namely the micro and macro perspectives. The micro perspective explains that there is in-tense competition in the banking world so that banks are forced to survive, devel-op and be efficient in operational activities. Meanwhile, the macro perspective ex-plains that an efficient banking industry can be influenced by the cost of financial intermediation and financial system stability (Ozkan et al. 2017). Both perspectives seem to direct institutions to continue to innovate and evaluate, so that banks are not rivaled by banks that are competitors in terms of price, quality of products and services offered and reduce customer interest in the bank.

Banking efficiency can be analyzed with four types, namely scale efficiency, scope efficiency, technical efficiency and allocative efficiency. A bank can be said to exceed scale efficiency if the bank is able to operate with constant returns to scale. Banks can be said to exceed the scale of coverage if the bank is able to operate in a diversified location. According to Coelli et al. (2005) the efficiency of an ability is measured by two approaches: the output variable approach and the input variable approach. The output variable approach is where an entity will maximize its profits so that the proportion of output can be increased and produced even if using the same or fixed inputs. Meanwhile, in terms of input variables, the entity will reduce the results of the proportion of input levels in order to create the same level of output (Tuffahati et al., 2016). However, the allocation efficiency can be exceeded if a bank is able to determine several that can generate maximum profits and technical efficiency is efficient which results in the achievement of the relationship between inputs and outputs in a production process.

BANKING EFFICIENCY MEASUREMENT

Efficiency measurement according to Muharam (2007) there are three types of approaches to measure banking efficiency, namely:

a) Ratio approach.

The ratio approach in measuring efficiency is done by calculating the com-parison between the output and input used in the discussion. A high effi-ciency assessment in the ratio approach is if it can produce the maximum amount of output but the minimum amount of input.

$$\text{Efficiency} = \frac{\text{output}}{\text{input}}$$

The weakness in this approach is that if there are several inputs and several outputs to be calculated, because if the analysis is carried out simultaneously it will lead to many calculation results so that it gives incorrect assumptions.

b) Regression approach.

Regression approach is an approach to measure efficiency using a model of a certain level of output, this is referred to as a function of various levels of certain inputs.

The regression function formula is as follows:

$$Y=f(X1, X2, X3, X4.....Xn)$$

Where Y = output; X = input

The regression approach can produce an estimate of the relationship that can be used to produce the level of output produced by an Economic Activ-ity Unit (UKE) at a certain input level. UKE can be said to be efficient if it is able to produce more output than the estimated output. In addition to the ra-tio, this approach also cannot overcome the condition of many outputs, be-cause only one output indicator can be accommodated in the regression equation. Combining many outputs in one indicator will result in a lack of detailed information.

c) Frontier approach.

This frontier approach can measure efficiency and is divided into two types of efficiency, namely parametric and nonparametric frontier approaches. The frontier approach of parametric type can be measured by parametric statistical tests such as using the Stochastic Fontier Approach (SFA) and Distribution Free Approach (DFA) methods. While the non-parametric approach can be measured by non-parametric statistical tests, namely by using the Data Envelopment analysis (DEA) method.

PREVIOUS RESEARCH

Nugraheni et al. (2021) mentions that go public and non-go public sharia commercial banks have been efficient with savings, operational costs, labor costs as input variables and output variables, namely financing and operating income. Amirillah's research (2014) found that the efficiency level of Islamic banking in Indonesia from 2005 – 2009 experienced a majority efficiency of 99.94%. However, there were at least five periods that experienced inefficiency, namely in July 2007 with an efficient rate of 99.52%, in January 2008 at 99.98%, in December 2008 at 98.49%, in July 2009 at 98 ,96% and in September 2009 it was 99.49%. Cahya 's research (2015) found that there were 4 Sharia Commercial Banks that were not efficient in 2010 – 2012. The four banks were BRI Syariah, BCA Syariah, Panin Syariah Bank and Victoria Syariah Bank with deposits, assets, labor costs, financing and operating income as the variables. Pambuko (2016) found that CAR, FDR, ROA, NPF and NIM have a positive and significant effect on the efficiency level of Islamic banking. Rahmawati's research (2015) states that the securities owned have a significant effect on the efficiency level of Islamic commercial banks. The results show that the cost efficiency levels of muamalat banks, independent Islamic banks and mega sharia banks are 96.95%, 96.92% and 94.93%, respectively. Of the three banks, only bank muamalat is the most efficient. Rosida & Hermawan's research (2020) states that Islamic commercial banks that experience fluctuations in their efficiency levels are BNIS and BRIS, but BNIS has the lowest efficiency value of 93.09%.

RESEARCH METHODS

This research is a type of descriptive research with a quantitative approach. According to Sujarweni (2015) quantitative research is a process of finding knowledge that uses data in the form of numbers as a tool to analyze information about what you want to know. These numbers can produce a new knowledge/science and technology.

The data used is secondary data. Secondary data is data obtained from pub-lished information. Researchers obtained secondary data directly from the official website of the Sharia Banking Report or Sharia Banking Statistics at the Financial Services Authority (OJK) , namely in the form of monthly and annual financial re-ports (Annual Reports) from the 2015-2019 period.

The variables used in this study are divided into two categories of input variables and output variables. The first category is total assets, operating expenses and savings as input variables and the second category is operating income and owned securities as output variables. The two categories were obtained from the Islamic banking financial reports published during the 2015-2019 period at the financial services authority (OJK). Then the data on these variables can be obtained through the following:

a) Total assets obtained from the financial statements of Islamic banking sourced from the official website, namely the financial services authority concerned during the study.
b) Operational expenses obtained from the financial statements of Islamic banking sourced from the official website, namely the financial services authority concerned during the study.

c) Deposits obtained from Islamic banking financial statements sourced from the official website, namely the financial services authority concerned dur-ing the study.
d) Operational income obtained from the financial statements of Islamic bank-ing sourced from the official website, namely the financial services authori-ty concerned during the study.
e) Owned securities obtained from Islamic banking financial statements sourced from the official website, namely the relevant financial services authority during the study.

The population in this study is Islamic Commercial Banks in Indonesia, which are registered with the Financial Services Authority. The researcher uses time series data, namely the 2015-2019 period, then the researcher determines the sample to be studied. Sampling in this study was carried out by purposive sampling. The sampling is a method of selecting samples that are selected based on considerations, where information is obtained with certain considerations and not randomly. The samples used must have criteria. Some of the sample criteria will be explained as follows:

a) Sharia Commercial Banks operating in Indonesia during the 2015-2019 observation period and excluding Sharia People's Financing Banks (BPRS) and Regional Development Banks (BPD).
b) Presenting complete and published financial report data for the period from 2015-2019.
c) The selected Islamic Commercial Bank is based on the same subsidiary of the Conventional Commercial Bank.

Based on these criteria, the Islamic commercial banks that were sampled were Bank Muamalat, BRI Syariah Bank, BNI Syariah Bank, Mega Syariah Bank, Bukopin Syariah Bank and BCA Syariah Bank in Indonesia during the 2015-2019 period.

The data analysis method used to calculate and analyze the efficiency is measured using a frontier approach, the frontier approach is a nonparametric method used to measure efficiency in this study. nonparametric approach there is a DEA method for determining the output and input variables used by using an intermediation approach. This approach emphasizes the function of the bank as a distributor of funds from parties who have excess funds then will be channeled to parties who lack funds, this is channeled into financial activities in order to achieve good banking performance efficiency. Some indicators of research variables are total assets, operating expenses, savings as well as operating income and securities owned as output variables.

Data Envelopment Analysis (DEA) is dedicated to calculating the efficiency of all units of each unit and relative efficiency scores, depending on the efficiency level of other units in the sample. The DEA approach evaluates the performance of DMUs through an analysis based on the evaluation of the relative efficiency values of comparable DMUs. Then the efficient DMU will form a frontier line. If the DMU is in the frontier line then the DMU can be said to be more efficient than other DMUs in the sample.

DEA originally developed by Charnes et al. (1978) assumes that a constant return to scale (CRS) uses multiple inputs and multiple outputs to measure a DMU. Banker, Charnes and Cooper (1984) re-developed the assumption of variable return to scale (VRS). Since then, DEA is often

used to evaluate and compare in terms of educational institutions, health institutions, agriculture, banking, market research, transportation and others (Chansarn, 2008) . The advantages of DEA are more relative than parametric techniques. Measuring efficiency, DEA identifies units that are used as a reference that can provide causes and solutions to inefficiencies, this is a major advantage in managerial software (Epstein & Henderson, 2010).

The DEA method was created as a tool to evaluate the performance of an activity within an organization. Emmanuel & Erwin (2017) describes two models in DEA, namely:

a) DEA CCR models (charnes, cooper and rhodes)

This model first appeared in 1978. This input-oriented CCR model is known as the CCR model which is based on the assumption of constant returns to scale (CRS). This model will compare each Economic Activity Unit (UKE) with all existing UKEs but on condition that the internal conditions of UKE are the same. Manufacturing companies are more appropriate to use this CCR model, due to measure the level of efficiency of its performance. The CCR approach applies the concept of CSR, where the addition of one input must add one output as well or the ratio of output values is constant.

b) Model DEA BCC (banker, charnes and cooper)

This BCC model is basically a development of the CCR model with the reason to be able to meet research needs. There is a difference between CCR and BCC, if the CCR model evaluates the overall efficiency, the BCC model has been separated between technical efficiency and scale efficiency. Service companies are more appropriate to use the BCC model to analyze performance efficiency, because the human resource factor plays a more significant role when compared to other factors, such as cash, capital and others.

Charnes et al. (1978) assume that the DEA method not only identifies inefficient units but also identifies the degree of inefficiency. The DEA approach itself has two orientations, namely; The first is input orientation which means minimizing the use of constant input-output and secondly output orientation which means maximizing the constant input-output.

Researchers use Banxia Frontier Analysis Software to calculate the value of performance efficiency by entering input and output variables that are used as measurements in this study. The several input and output variables after entering the data, it will produce an efficiency score with a good performance efficiency category, namely banks that achieve a performance efficiency level of 100%.

RESULT AND DISCUSSION

DATA DESCRIPTION

The sampling method used in this research is purposive sampling. Six Islamic commercial banks in Indonesia are the object of this research and the six samples are Muamalat, BRI sharia, BNI Syariah, Bank Mega Syariah, sharia bank Bukopin and BCA sharia. The sample is used as an object because it has provided financial report data for the 2015 – 2019 period. The calculation of the efficiency of the six Islamic commercial banks uses Data Envelopment Analysis (DEA).

This study uses savings, operating expenses, total assets as input variables and operat-ing expenses, securities owned as output variables.

Table 4.1
The development of Islamic commercial bank assets for the period 2015 – December 2019
(In millions)

Bus name	2015	2016	2017	2018	2019
Bank Muamalat	57,802,661	55,851,770	61,785,967	57,274,676	50,408,985
BRI Syariah	24,239,170	27,693,406	31,546,275	38,480,749	43,112,706
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BCA Syariah	4,353,594	4,996.621	5.952.007	7,066.453	8,628,917

Source: OJK, 2021

Table 4.1 shows that the total assets of Islamic banking have fluctuated but there are also Islamic banks which have continued to increase. The increase in total assets was due to public trust in these financial institutions. Public trust is very im-portant in the banking world because it can increase growth and even development for banking itself. The Islamic banks that continue to experience an increase are BRI Syariah, BNI Syariah, Bank Mega Syariah and BCA Syariah, the four banks contin-ued to experience an increase during the 2015 – 2019 period. This indicates that the four banks have managed and channeled their funds appropriately and well.

Table 4.2
The development of deposits, operating expenses, operating income and securities owned by Islamic commercial banks for the period 2015 – December 2019.
(In millions)

Indicator	2015	2016	2017	2018	2019
Savings	1,787,557	1,611.109	2,163,326	1,798,536	2,174.263
Operating expenses	7,038,226	7,166,633	6,961,620	7,727,739	7,768,526
Operating income	1,733,411	2.268.135	1,897,079	2,515,890	2,043,912
Securities owned	9,643,599	13,786,697	18,247,659	31,083,574	32,551,420

Source: OJK, 2021

The data in table 4.2 explains that deposits continue to increase from year to year, while operating income and operating expenses fluctuated from 2015 to 2019 and securities owned have always increased, even the increase was very high. This shows that the management of

Islamic banking is still not good because the income is still fluctuating. Islamic banking must continue to develop and innovate so that funds and assets can generate efficiency in banking itself.

ANALYSIS AND DISCUSSION

The results of the calculation and analysis of the efficiency level of Islamic commercial banks using data envelopment analysis (DEA). Efficiency calculations at bank muamalat, BRI sharia, BNI Syariah, Bank Mega Syariah, sharia bank Bukopin and BCA sharia use three input variables and two output variables. The calculation of the efficiency of the Islamic commercial bank is using the Banxia elec-tronic delivery software.

The criteria for acceptance and rejection of the hypothesis with the calcula-tion of efficiency using data envelopment analysis in this study is that if a period of Islamic banking can be declared efficient if it is worth 100%, whereas if the value is below 100% it can be said that the Islamic bank is inefficient. Calculations using da-ta envelopment analysis also contain actual numbers and target numbers. The ac-tual number is the number of inputs and outputs owned, while the target number is the number suggested by the results of the DEA data processing so that the input and output are efficient. Potential improvement is the percentage in the addition of targets in order to achieve the targets generated by the DEA calculation.

Table 4.3
Efficiency level of bank muamalat, BRI sharia, BNI Syariah, Bank Mega Syariah, sharia bank Bukopin and BCA sharia
(In percent)

Bank name	Year				
	2015	2016	2017	2018	2019
BMU	100	100	100	100	100
BRI	97.72	100	100	100	100
BNI	100	81.87	100	73.59	99.25
BMS	100	100	100	100	100
BSB	100	100	100	100	100
BCA	100	100	100	100	100

Source: Data processed using Banxia

Based on the data in table 4.3 above, the efficiency level at six Islamic com-mercial banks, namely muamalat bank, mega sharia bank, bukopin sharia bank and BCA bank experienced efficiency in a row during the 2015 – 2019 period. This shows that the four Islamic commercial banks manage and use funds properly. Bank BRI Syariah experienced efficiency during the period 2016 – 2019, but only in 2010 experienced inefficiency. Meanwhile, BNI Syariah banks experienced efficiency for only one period, namely 2010. This proves that BNI banks must evaluate the management and distribution of funds.

a) BRI Syariah bank input and output targets

Based on the results of the calculation of the efficiency level of the DEA method assuming *Variable Return to Scale* (VRS) using *Banxia Electronic De-livery software*, it is shown that the achievement of the efficiency value for each year in table 4.4.

Table 4.4
BRI Syariah bank efficiency level
(In million rupiah)

Year	Variable	actual	Target	Potential Improvement
2015	Input			
	Savings	226453	207770.2	-8.25
	Operating expenses	1409462	1409462	0
	Total assets	24239170	24239170	0
	Output			
	Securities owned	2181054	2232006	2.34
	Operating income	138380	185866,1	34.32
2016	Input			
	Savings	25878	25878	0
	Operating expenses	1534557	1534557	0
	Total assets	27693406	27693406	0
	Output			
	Securities owned	4996190	4996190	0
	Operating income	147384	147384	0
2017	Input			
	Savings	519298	519298	0
	Operating expenses	1662122	1662122	0
	Total assets	31546275	31546275	0
	Output			
	Securities owned	7411068	7411068	0
	Operating income	174495	174495	0
2018	Input			
	Savings	53008	53008	0
	Operating expenses	2117241	2117241	0
	Total assets	38480749	38480749	0
	Output			
	Securities owned	9598114	9598114	0
	Operating income	513568	513568	0
2019	Input			
	Savings	63667	63667	0
	Operating expenses	2371880	2371880	0
	Total assets	43112706	43112706	0
	Output			
	Securities owned	10268066	10268066	0
	Operating income	328558	328558	0

Source: Data processed, 2021

Based on table 4.5, it is explained that BRI Syariah banks experienced inefficiency in 2015 due to the use of deposit inputs, with an actual value of 226453. While the input efficiency target that should have been used was 207770.2. So, to achieve input efficiency, it is necessary to reduce the input savings by 8.25%. Another factor causing the inefficiency of the BRI Syariah bank is not achieving the output target, namely securities owned and operating income with actual values of 2181054 (securities) and 138380 (income), while the targets to be achieved are 2232006 (securities) and 185866, 1 (income) so that it needs to be increased by 2.34% to achieve efficiency in the output of securities and 34.32% for efficiency in the output of operating income. The results of this study are in line with the results of his research in line with Rahmawati (2015) who found that BRIS has a low level of cost efficiency and profitability. Alfiyah (2017) also found that the output variable experienced in-efficiency, namely the distribution of financing so that the distribution of financing needed to be added by 6.14%. In 2015 BRIS needs to be added with securities so that it can touch the point of efficiency. In addition, BRIS also needs to add operating income to increase the efficiency level of BRIS itself. If both are increased, the efficiency level of BRIS will always be stable.

b) BNI Syariah bank input and output targets

Based on the results of the calculation of the efficiency level of the DEA method assuming Variable Return to Scale (VRS) using the Banxia Electronic Delivery software, it is shown that the achievement of the efficiency value each year in table 4.4.

Table 4.5
BNI Syariah bank efficiency level
(In million rupiah)

Year	Variable	actual	Target	Potential Improvement
2015	Input			
	Savings	70000	70000	0
	Operating expenses	1467437	1467437	0
	Total assets	22995377	22995377	0
	Output			
	Securities owned	2301687	2301687	0
	Operating income	137829	137829	0
2016	Input			
	Savings	92853	80757.37	-13.03
	Operating expenses	1690703	1559654	-7.75
	Total assets	28314175	28314175	0
	Output			
	Securities owned	3978456	4859607	22.15
	Operating income	159368	194664,9	22.15
2017	Input			
	Savings	150150	150150	0
	Operating expenses	2035841	2035841	0

Year	Variable	actual	Target	Potential Improvement
	Total assets	34828327	34828327	0
	Output			
	Securities owned	5231119	5231119	0
	Operating income	214789	214789	0
	Input			
	Savings	250150	249339.8	-0.32
	Operating expenses	2319828	2141473	-7.69
2018	Total assets	41053167	41053167	0
	Output			
	Securities owned	7327576	9957488	35.89
	Operating income	274976	638606.6	132.24
	Input			
	Savings	333366	333366	0
	Operating expenses	2678041	2259882	-15.61
2019	Total assets	49954163	44267520	-11.38
	Output			
	Securities owned	8413612	10441470	24.1
	Operating income	424666	427895.4	0.76

Source: Data processed, 2021

Based on table 4.6, it explains that BNI Syariah bank experienced inefficiency in 2016 due to the use of deposit inputs, with an actual value of 92853 and operating expenses of 1690703. While the input efficiency targets that should have been used were 80757.37 (savings) and 1559654.4 (operating expenses). So, to achieve input efficiency, it is necessary to reduce the input savings by 13.03% and operating expenses by 7.75%. Another factor causing the inefficiency of the BNI Syariah bank is not achieving the output target, namely securities owned and operating income with an actual value of 3978456 (securities) and 159368 (income), while the target to be achieved is 4859607.33 (securities) and 194664.94 (income) so that it needs to be in-creased by 22.15% to achieve efficiency in the output of securities and 22.15% for efficiency in the output of operating income.

In 2018, BNI Syariah bank experienced inefficiency due to the use of de-posit inputs, with an actual value of 250150 and operating expenses of 2319828. Meanwhile, the input efficiency targets that should have been used were 249339.8 (savings) and 2141472.93 (operating expenses). So, to achieve input efficiency, it is necessary to reduce the input savings by 0.32% and operating expenses by 7.69%. Another factor causing the inefficiency of the BNI Syariah bank is not achieving the output target, namely securities owned and operating income with an actual value of 7327576 (securities) and 274976 (in-come), while the target to be achieved is 9957488.1 (securities) and 638606.56 (income) so it needs to be increased by 35.89% to achieve efficiency in the output of securities and 132.24% for efficiency in the output of operating in-come.

In 2019, BNI Syariah bank experienced inefficiency due to the use of operating expense inputs, with an actual value of 2678041 and total assets of 49954163. While the input efficiency

targets that should have been used were 2259882.07 (operating expenses) and 44267519.7 (total assets). So, to achieve input efficiency, it is necessary to reduce the input operating expenses by 15.61% and total assets by 11.38%. Another factor causing the inefficiency of the BNI Syariah bank is not achieving the output target, namely securities owned and operating income with an actual value of 8413612 (securities) and 424666 (income), while the target to be achieved is 10441470.4 (securities) and 427895.41 (income) so it needs to be increased by 24.1% to achieve efficiency in the output of securities and 0.76% for efficiency in the output of operating income. The results of his research are in line with Puspitasari et al., (2018) Islamic commercial banks that experienced the highest inefficiency were BNIS in the period 2014 – 2015. Rosida & Hermawan (2020) found that BNIS was included in the inefficiency category with a value of 93.09%.

Based on the results described above, there are several ways to create efficiency levels in Islamic commercial banks:

1. For Islamic commercial banks, it is necessary to fix and allocate their funds properly so that the level of efficiency remains stable
2. For the two Islamic commercial banks, namely BRIS and BNIS, in order to achieve a level of efficiency, in terms of output, it is necessary to increase the securities owned and operating income, but it is also necessary to re-duce deposits and if all are implemented, BRIS will reach a stable point of efficiency.

CONCLUSION

The development of the national banking industry has proven to be advanced with the amendment of Law no. 7 of 1992 into Law no. 10 of 1998 concerning bank-ing, which recognizes the existence of a Dual Banking System, namely a conven-tional system with a sharia system or profit sharing. The existence of this system has an impact on the position of Islamic banks in Indonesia getting stronger and the role of the government in regulating specifically in Law no. 21 of 2008. In order to meet the needs of society, the government and the directors of conventional banks established Islamic banking as a bank that follows Islamic principles. The growth of Islamic banking is also inseparable from sound financial reports. The soundness of financial statements is referred to as the efficiency of financial statements.

Efficiency is a benchmark to see the accuracy in the management and distribution of customer funds. Islamic banking in Indonesia is divided into 13, but in this study only 6 Islamic banks were sampled because these banks met the criteria. Looking at the results of this study, bank muamalat, mega sharia bank, bukopin sha-ria bank and BCA sharia bank is considered efficient in managing and distributing funds. The two Islamic banks, namely BRI Syariah and BNI Syariah Bank, are considered inefficient and inefficient due to the management and distribution of funds whose input variables are savings, operating expenses, total assets and other fac-tors are also influenced by securities owned, operating income as an output variable is not on target.

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