

Efficiency of Commercial Banks in Indonesia After the Covid-19 Pandemic

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Abstract

The impact of the Covid-19 pandemic has caused the condition of the banking sector, both conventional and sharia, in Indonesia to be unstable due to the policy of limiting the Covid-19 pandemic period which affects the efficiency of bank performance on credit and financing activities disbursed as well as bank operations. This research aims to measure the level of efficiency of Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 pandemic and to find out whether or not there is a difference in efficiency between CCB and SCB after the Covid-19 pandemic. The method used in this study is a quantitative method with a Data Envelopment Analysis (DEA) analysis model and a different test with the inputs used, namely capital, assets, deposits, and operational costs, then the output consists of credit and financing realization, as well as operating income. The results showed that CCB achieved an average efficiency level of 98.8 percent and SCB achieved an average efficiency level of 98.6 percent, which means that both banks have reached high efficiency levels after the Covid-19 pandemic. Then CCB and SCB experienced fluctuations that tended to be the same, so that the results of different tests showed a probability value of 0.9138 and greater than 0.05, then H_0 was accepted which means that there is significantly no difference between the efficiency of CCB and SCB after the Covid-19 pandemic.

Keywords : Conventional commercial banks, DEA, Efficiency, Sharia commercial banks.

JEL Classification : E5, G2

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1. Introduction

Banking is a variable in a country's economy that cannot be separated in terms of monetary activities of a country's economy through a role that supports financial flows in national financial stability. Banking activities can affect the money supply and money demand that regulates the national economic financial stability system through the role of banks, both conventional banks and Islamic banks, as intermediation institutions to collect and distribute funds to the public (Habibah, 2020; Ningsih & Mahfudz, 2020; Simatupang, 2019).

Reporting from the Central Statistics Agency (2022), the Indonesian economy experienced an economic decline, namely in 2019 to 2020 where Indonesia's GDP fell by around 221 billion Rupiah and until Q2 2022 Indonesia's GDP slowed down -1.62 percent (yoy) which was affected by the impact of the Covid-19 pandemic. The impact of the pandemic is a challenge for Indonesia in terms of the economy, both fiscal and monetary in the process of supporting the success of local economic activities. The banking sector during the pandemic has become an affected sector due to policies taken to reduce the spread of Covid-19. The weakening of the MSME and industrial sectors directly affects third-party deposits and financing in banks. As a result, banks cannot freely disburse credit, this is due to a higher risk of credit failure for creditors because the income of most people, both individuals and Business is reduced during the Covid-19 pandemic (Effendi & Hariani, 2020; Seto, 2021).

Banking work in December 2020, namely during the Covid-19 pandemic until August 2022 during the post-Covid-19 pandemic, showed various percentages of increases and decreases in each variable of bank performance. In the capital owned by the two banks, there is an increase in capital between CCB and SCB. However, SCB experienced a higher increase than CCB which reached a 32 percent increase in capital and 24 percent in an increase in assets owned by banks. Then there was an increase in deposits, in SCB which was 6 percent higher than the increase experienced by SCB which was triggered by an increase in SCB's higher capital and assets. However, although the asset and capital aspects of CCB and SCB increased, the operational costs of CCB and SCB experienced a fairly high decline, namely a decrease of 35 percent in CCB and 29 percent in SCB. Then the decline was also followed by the aspect of operating income which is the income from the daily activities of the bank. The decline was about 26 percent on CCB and 21 percent on SCB.

Table 1. CCB and SCB Performance Indicators in Indonesia (in Billions)

Indicators	CCB			SCB		
	2020	2022	(%)	2020	2022	(%)
Capital	1.360.376	1.635.201	20	46.853	61.966	32,0
Assets	8.780.681	10.393.085	18	397.073	492.536	24,0
TPF	6.342.538	7.608.401	20	322.853	407.266	26,0
Operating Costs	849.954	554.235	-35	30.410	21.656	-29,0
Credit/Financing	5.235.027	6.179.454	18	246.532	305.851	24,0
Operating Income	981.650	722.723	-26	35.548	28.001	-21,0
Securities	1.466.904	1.811.093	23	86.932	128.786	48,0
BOPO (%)	86,58	76,69	-11	85,55	77,34	-9,5

Source: Financial Service Authority (2022)

In table 1 the decrease in costs and operating income also affected the ratio of BOPO CCB and SCB which decreased. The decrease in BOPO occurred around 11 percent in CCB which experienced a higher decline than SCB which only reached a decrease of 9.5 percent. This indicates a decrease in bank operations in the structure of credit and financing carried out which affects the bank's operating income. Thus, the suboptimal performance of the banking industry, which causes the BOPO ratio to tend to decrease, indicates that the bank's efficiency performance is not good so that the bank experiences an impact on performance inefficiency (Erlinda Sholihah, 2021; Seto, 2021).

Reporting from ekon.go.id (2021) the Coordinating Ministry for Economic Affairs through the Financial Service Authority or OJK implemented a new policy during the Covid-19 pandemic which became a new reference for banks in Indonesia. This policy became a new innovation, then one of them was as an implementation for the ease of community credit and MSMEs during the pandemic. The ease of realization of bank loans and financing can strengthen the bank's profile as an intermediation institution that can reflect an increase in bank performance ratios to be able to improve more efficient management of bank performance (Agustin, 2019; Siringoringo, 2017).

Based on this description, which identifies efficiency in the banking industry, which is one of the most important sectors in the Indonesian economy in the financial sector, which is contained in the background of this study. Including Indonesia, which applies dual systems to banking, namely conventional and sharia systems. For this reason, this study aims to determine the level of efficiency of Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia, as well as whether or not there are differences in efficiency between the two banks.

2. Hypotheses Development

Bank efficiency is a reflection of bank performance which is measured based on optimizing banking aspects, namely by utilizing the amount of inputs owned by banks in achieving certain outputs that are maximized by the use of inputs used. The use of inputs and outputs in the bank can result in maximum bank performance, thus reflecting the bank's efficiency over the quality of bank performance including efficient or inefficiency (Amirillah & Permalink, 2014).

This study measures the level of bank efficiency in CCB and SCB in Indonesia. The measurement uses an intermediation approach and bank performance based on input and output variables. The previous research by regarding the efficiency of banks using assets, capital, operating costs as inputs, and output variables consisting of operating income, credit, and securities owned by banks. The same research was proposed by using input variables from Putri (2018) and Ayuningtyas (2020) Third Party Funds (TPF), operating costs, and assets, as well as output variables using operating income and financing realization. So that in this study about the efficiency between CCB and SCB using input variables in banks, namely capital, assets, operational costs, and Third Party Funds (TPF). As well as output on the realization of credit and financing, and operating income.

Capital in a bank shows the bank's ability to manage aspects of channeling bank risks related to fund activities. Capital can be measured in the form of a capital adequacy ratio as a possibility of whether the bank can cover the risks that occur or not, the adequacy of this ratio must also be above 8 percent of the risks borne by the bank. This is because bank capital can finance assets that are productive in nature such as in lending and in financing operational activities. Thus, the bank's capital adequacy affects the Return on Asset (ROA) because the capital disbursed affects the return on credit and operating income received by the bank (Janrosi & Yuliani, 2017; Nurhasanah & Maryono, 2021).

Assets are assets or economic value owned by banks as a support for the productivity activities of a bank in carrying out bank operations through measuring asset quality. Banks can demonstrate performance by meeting asset quality at a minimum limit of 5 percent of Net Performing Loans (NPLs). The value of the NPL affects the aspect of the profitability ratio of a bank. NPLs are directly related to credit interest on loans disbursed by banks to the public. So that when a credit failure occurs, it affects the interest income and operating income of the bank and affects the ability of the capital adequacy ratio (Buctic & Sudiarta, 2016; Mulyani & Budiman, 2017).

Third Party Funds (TPF) are deposits of funds originating from customers that are entrusted to be used by banks as intermediation institutions to channel funds back as a financial flow process. Deposits collected by banks become the main activity in providing bank profits, the higher the deposits collected, the easier it is to realize credit to customers. Thus, it affects the quality of failed credit risk as measured in Net Performing Financing (NPF). The quality of financing from deposits strengthens the bank's intermediation function to carry out risks to NPF which have an influence on credit failure in customers (Filial Piety, 2017; Gayo et al., 2022).

Operational costs at the bank include costs that are incurred as a process to support the bank's operational activities. Operating costs in a bank are often juxtaposed with bank operating income which is the bank's income derived from the operational activities of the bank including activities on deposits. Operating costs and income at this bank become BOPO ratios which are

indicators in determining bank efficiency based on costs and revenues. The higher the BOPO value, the higher the efficiency of the bank is achieved. The BOPO ratio also affects the bank's credit quality. When there is a bad credit that causes the bank not to function as an intermediation institution, the bank needs the costs incurred for the elimination of productive assets in covering the collectibility of banks that are not sufficient in meeting the bank's CAR criteria (Afkar, 2017; Kurniasari, 2017).

Inputs used as performance processes in banks produce targeted outputs into comparisons for efficiency measurements. The use of inputs owned by banks produces high outputs that reflect the optimal performance of banks in banking activities which shows the efficiency of the bank. The performance of the bank continues to grow based on the increase in each input owned by the bank. The measurement of efficiency in optimizing inputs and outputs is carried out to see the efficiency of CCB and SCB after the Covid-19 Pandemic.

3. Method, Data, and Analysis

Research Method.

This research is descriptive analysis with a quantitative approach. The quantitative method is a positivistic method because it is based on the philosophy of positivism with the scientific method because it meets scientific rules, namely empirical or concrete, objective, measurable, rational and systematic with research data in the form of numbers and statistical analysis (Sugiyono, 2013). The analysis in question is a research focus on efficiency variables in banking which is then carried out to identify research results in the form of conclusions using a quantitative approach. Then, the population that became the focus of the study was Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia. By determining the research sample by purposive sampling technique, namely determining the sample with the specified criteria. The criteria are Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) which report bank financial statements every month at the interval of reports from January 2021 to August 2022 and published on the website services of Indonesian Banking Statistics and Indonesian Sharia Banking Statistics (SBS) at the Financial Service Authority (OJK).

This study uses secondary data, namely data that is not directly taken from parties in the study and data obtained from data sources that have been published in the document (Sugiyono, 2013). This research data was obtained from Indonesian Banking Statistics and Indonesian Sharia Banking Statistics (SBS) published on the website Financial Service Authority (OJK). The data taken are capital data, assets, operational costs, and Third Party Funds (TPF), which are input variables in this study. Then the data on the realization of credit and financing, and Return on Asset (ROA), which is the output variable in this study.

Analysis Models

In this study, there are two stages in data analysis to get an interpretation of the conclusions of the research results based on the analysis model used. The analysis includes:

Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is a deterministic non-parametric approach that measures the relative efficiency of production frontiers based on empirical data grouped by multiple inputs and multiple outputs. The input and output model becomes the process of forming a basic function that describes the efficiency value of the comparison between the input value and the output value, that is, by measuring the ratio of existing units and compared with the ratio of other units that are considered the most efficient in the existing dataset. The function of the ratio of inputs and outputs in this analysis (Naufal & Paradise, 2017), is as follows:

$$h_s = \frac{\sum_{i=1}^m U_i Y_{is}}{\sum_{j=1}^n V_j X_{js}}$$

$$\text{Maks } h_s = \frac{\sum_{i=1}^m U_i Y_{is}}{\sum_{j=1}^n V_j X_{js}} \leq 1; r = 1 \dots N$$

Where U_i and $V_j \geq 0$

Where: h_s = Bank efficiency s ; m = Observed output bank s ; n = Observed input bank s ; Y_{is} = Number of outputs i produced by banks s ; X_{js} = Number of inputs used by banks s ; U_i = Weight of output i produced by banks s ; V_j = The input weight j that the bank gives s , and i is calculated from 1 to m , as well as j calculate from 1 to n .

Test Difference

In this study, it also used a different test analysis. This analysis is used to find out whether there is a difference in efficiency between CCB and SCB after the Covid-19 Pandemic. Before conducting a different test, first conduct a normality test to find out whether the data is normally distributed or not. The basis for calculating the normality test is if the data is normally distributed and the test is carried out using a parametric approach $L_{hitung} > L_{label}$, then if the data is not normally distributed and the test is carried out with a non-parametric approach $L_{hitung} < L_{label}$. After the researcher conducted a normality test with the results, then this study could use a non-parametric approach in an independent sample, namely the Mann Withney test. $L_{hitung} < L_{label}$ As for the equation in this test (Suyanto & Gio, 2017), namely:

$$U_1 = n_1 n_2 + \frac{(n_1)(n_1+1)}{2} - R_1$$

$$U_2 = n_1 n_2 + \frac{(n_2)(n_2+1)}{2} - R_2$$

$$\mu_{w1} = \frac{n_1(n_1+n_2+1)}{2}$$

$$\text{Variance } \alpha_{w1}^2 = \frac{n_1 n_2 (n_1+n_2+1)}{12}, \quad \text{if } n_1 n_2 > 8, \text{ then}$$

$$Z_0 = \frac{W_1 + \mu_{w1}}{\alpha_{w1}}$$

$$Z = \frac{U - \left[\frac{n_1 n_2}{2} \right]}{\sqrt{\frac{(n_1)(n_2)(n_1+n_2+1)}{12}}}$$

This test is carried out on the basis n_1 indicating the number of elements of the first sample and n_2 indicating the elements of the second sample. It then R_1 and R_2 shows the ranking held by the sample. This Mann-Whitney test is based on statistics by maximizing on U_1 , U_2 the one compared to U_{kritis} . Then this test can be transformed on a standardized Z test, if the sample measurements are moderate or more than 8. The Z value is calculated being the decision making of the test value by comparing the probability value against the significant test value.

Then the determination of the test results is based on the probability value, that is, if $U_{hitung} > U_{krit}$ then it is accepted H_0 , then if it is then it is rejected and accepted H_1 . So this study raises the possibility of two hypotheses that occur, namely:

H_0 = there is no difference in efficiency between Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 Pandemic.

H_1 = there is a difference in efficiency between Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 Pandemic.

4. Results

Efficiency Level of Commercial Banks in Indonesia After the Pandemic Covid-19

This research resulted in a calculation that obtained an efficiency value between Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 pandemic. Economic conditions are affected by policies during the Covid-19 pandemic that have an impact on the banking sector as in the previous discussion. For this reason, the efficiency value in CCB and SCB is generated based on a comparison between inputs and outputs at each bank which is calculated based on the bank's approach as an intermediation institution or an institution that collects and distributes funds to the community. Input variables consisting of capital, assets, deposits, and operating costs, as well as output variables consisting of credit and financing realization and operating income at each bank. Then, the comparison of inputs and outputs is calculated to obtain efficiency values through the Data Envelopment Analysis (DEA) analysis model with the Constant Return of Scale (CRS) model and is output-oriented. The model assumes that any increase in the proportion of inputs used by the bank also increases the percentage of output produced to the maximum with an increase in the same value.

The level of bank efficiency can be said to be efficient, namely when the bank is able to produce an efficiency value that reaches 1 (one) or 100 percent of the calculation results. This means that the bank as an Economic Activity Unit (UKE) is able to utilize all aspects of the bank optimally in the use of inputs so as to produce targeted outputs. As for banks, it can be said to be inefficient if the efficiency value is below 40 percent. For this reason, the calculation results that show the efficiency value of CCB and SCB in Indonesia after the Covid-19 Pandemic are discussed in the next discussion. After calculating efficiency with a comparison between the inputs and outputs of CCB and SCB in the period January 2021 to August 2022, it produces CCB efficiency values with Data Envelopment Analysis (DEA) analysis. based on the CRS assumption model using DEAP Version 2.1 software, as follows:

Table 2. Efficiency Level of Commercial Banks

Era	Efficiency		Era	Efficiency	
	CCB %	SCB %		CCB %	SCB %
Jan-21	100	100	Nov-21	100	100
Feb-21	99,6	100	Dec-21	99,0	100
Mar-21	99,7	100	Jan-22	94,1	92,9
Apr-21	99,7	100	Feb-22	94,8	94,0
May-21	99,9	100	Mar-22	95,7	94,7
Jun-21	100	99,7	Apr-22	97,9	96,8
Jul-21	100	99,3	May-22	98,1	98,0
Aug-21	100	99,6	Jun-22	99,8	99,3
Sep-21	100	100	Jul-22	100	99,4
Oct-21	99,3	100	Aug-22	100	100

Table 2. shows the efficiency value of CCB and SCB from January 2021 to August 2022, namely the bank's performance period after the Covid-19 pandemic. CCB experienced perfect efficiency at the beginning of the 2021 period, namely in January with an efficiency value of 1 (one) or 100 percent. The early period of 2021 is a period of development of CCB's high efficiency condition caused by the quality of CCB's capital adequacy which grows based on OJK policy as

one of the microprudential monetary authority institutions in improving economic conditions through strengthening the bank's capital structure and strengthening the profile of MSMEs through ease in the realization of loans and financing proposed to banks. Thus, the adequacy of capital and assets owned by the bank is able to suffice the credit realization activities provided by the bank to customers in accordance with the expected target which ultimately supports the proportion between inputs and outputs that are perfect.

February 2021 CCB efficiency contracted compared to January with a decrease of -0.4 percent. However, CCB efficiency increased again in the period from March to May 2021 so that the CCB efficiency value was still maintained at the high efficiency criteria. From June to September 2021 CCB experienced a perfect efficiency again with a 100 percent efficiency rate. CCB's engineering efficiency decreased back in October 2021 and December 2021 with a contraction that reached 1 percent. The stability of CCB efficiency conditions in 2021 with the high efficiency category defines the optimal level of CCB performance in the use of all bank inputs as well as being maximally successful in achieving targeted outputs. The level of efficiency of CCB fluctuates due to asset quality and operating costs which tend to increase every month period. Productive bank assets are not optimized, affecting Net Performing Loans (NPLs) which affect the quality of credit disbursed to the public. Then, the use of operating expenses to cover all operating expenses for the bank's increased daily performance was also not followed by an increase in operating income. The CRS model that assumes any increase in input then increases output by the same value does not overall correspond to CCB's operating costs and income. There was an increase in the proportion of operating income that was lower than the increase in CCB's operating costs.

In 2022 after Indonesia's economic condition tends to recover after the Covid-19 pandemic, as can be seen from the increase in Indonesia's economic growth rate which increased by 5.72 percent (yoy) from lpe in 2021 which only reached 3.51 percent (yoy) to strengthen Indonesia's economic position, including the financial and banking sectors. However, LPE in the first quarter of 2022 increased no more freely in the LPE in the third quarter of 2022 which was only 5.02 percent (yoy). This is also followed by developments in CCB efficiency which continues to contract at the beginning of the period or first quarter and along with increasing again in the second quarter of 2022 by achieving high efficiency criteria. The decline in CCB efficiency in the first quarter of 2022, which reached an average contraction of -4 percent, shows that there are few aspects that are not optimal in the use of CCB inputs, especially in the non-optimal use of CCB's productive assets for credit activities, the high deposits that CCB stores are stored into bank deposits due to non-distribution of credit realization and the growth in the value of operating costs which is higher than the percentage increase in CCB's operating income. Thus, the realization of credit and operating income that does not reach the expected target is a lack of perfect efficiency that can be achieved by CCB. however, CCB achieved a perfect efficiency score in the third quarter of 2022, with an efficiency of 100 percent. During the period from January 2021 to August 2022 or the period of CCB's performance after the Covid-19 pandemic, CCB achieved a high level of efficiency, namely with an efficiency value of 98.8 percent.

Then, the efficiency of SCB in the period January 2021 to August 2022, or during the post-Covid-19 pandemic period, experienced fluctuating efficiency levels during the span of that period. However, the efficiency level of SCB remains in the high-efficiency category, which means that SCB is close to achieving the targets on the performance that SCB has done. The period of 2021 became a high stable period achieved by SCB with an average efficiency value that has not changed with a perfect efficiency value of 100 percent high efficiency. The level of SCB efficiency can also be sustainable with optimal CCB performance with one of the policies carried out in the banking sector after the Covid-19 pandemic, namely by strengthening the capital side and monetary policy carried out to facilitate credit for MSMEs to improve the structure of the national economy which contracted during the Covid-19 pandemic. These conditions reflect SCB's capital and assets that are growing and optimally in supporting SCB performance activities to achieve maximum output conditions at the targeted level.

The adequacy of SCB's capital in supporting the bank's operational activities and the quality of productive assets owned by SCB are SCB's strengths in facing the bank's function as an intermediation institution, namely to distribute bank funds to the public in the form of SCB financing. Thus, this condition is a tendency to increase in the realization of financing provided by SCB. Then, the intermediation function of SCB is to raise funds through the collection of Third Party Funds (TPF) collected from the public into productive bank deposits that can re-affect the capital structure and productive assets through the ROA level that SCB can generate on the realization of the credit provided. Thus, the achievement of a perfect efficiency value can be defined that the SCB can optimally manage the input aspects used to obtain the targeted output to the maximum.

In the 2021 period, SCB still experienced a low decrease in efficiency which contracted by -0.3 percent, namely in June to August 2021 with efficiency levels reaching 99.7 percent, 99.3 percent and 99.6 percent, respectively. Then, the 2022 period becomes the post-Covid-19 SCB pandemic period which is starting to be unstable in SCB efficiency conditions. Where at the beginning of the 2022 period, SCB experienced a contraction in the SCB efficiency level of -7.1 percent from December 2021, the decline in the efficiency level continued in a volatile manner during the period 2022 to July 2022. The fluctuating efficiency level of SCB is influenced by the quality of productive assets and deposits collected to be distributed through financing to the public, as well as funds used for operational activities that are not in line with the growth in SCB's operating income. Thus, the occurrence of non-optimal use of SCB inputs in achieving the targeted output. However, SCB in August 2022 again achieved a perfect efficiency level at 100 percent efficiency value, which can be interpreted as SCB has optimally returned to using inputs, thus achieving the targeted output to the maximum. During the period from January 2021 to August 2022 or the post-Covid-19 pandemic period, SCB achieved a high efficiency level with an efficiency value of 98.6 percent.

Differences in the Efficiency of Commercial Banks in Indonesia after the Covid-19 Pandemic

Before conducting a different test for testing whether there is a difference between the efficiency of Conventional Commercial Banks and Islamic Commercial Banks after the Covid-19 pandemic, a normality test is first carried out to see whether the data tested is normal distributed or not. Different tests are carried out on the results of the calculated L , if then the data is normally distributed and the test is carried out using a parametric approach $L_{hit} > L_{lab}$, then if $L_{hit} < L_{lab}$ then the data is not normally distributed and the test is carried out with a non-parametric approach. The results of the normality test can be seen in figure 4.1. in the next discussion.

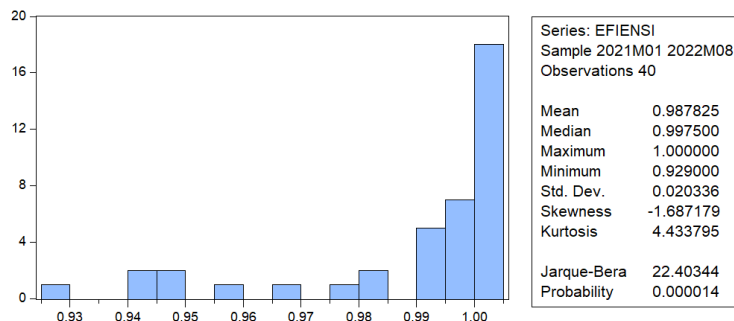


Figure 1. Normality Test Results

Figure 4 shows the normality test results of the Jarque-Bera approach through calculations using E-Views10 software. As for the test results, they show the test results of 22.40344 with a probability value of 0.000014, the probability value is smaller than that of L_{lab} $0,000014 < 0.05$. Thus, the data in this study are not normally distributed and different tests can use a non-parametric approach with independent samples, namely the Mann-Whitney test.

Table 3. Test for Equality of Medians of Efisiensi

Method	df	Value	Probability
Wilcoxon/Mann-Whitney		0.108	0.913
Wilcoxon/Mann-Whitney (tie-adj.)		0.113	0.909
Med. Chi-square	1	0.000	1.000
Adj. Med. Chi-square	1	0.100	0.751
Kruskal-Wallis	1	0.014	0.903
Kruskal-Wallis (tie-adj.)	1	0.016	0.898
Van der Waerden	1	0.108	0.741

Table 4. Category Statistics

BANK	Count	Median	>Overall Median	Mean Rank	Mean Score
BUK	20	0.997	10	20.275	-0.037
BUS	20	0.998	10	20.725	-0.047
All	20	0.997	20	20.500	-0.042

Figure 4.2. showed different test results through the Mann-Whitney test with a value of 0.108200 and a probability of 0.9138, the value is significantly higher than, or $0.9138 > 0.05$. Thus, the results of different tests show that H_0 is accepted and H_1 is rejected, which means that there is no difference in efficiency between Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 pandemic.

5. Discussion

The impact of the post-Covid-19 pandemic in Indonesia has affected the banking sector with input conditions consisting of capital, assets, deposits and operational costs, as well as outputs consisting of credit realization as well as financing and operating income fluctuating with conditions tending to increase in each variable every period from January 2021 to August 2022. This condition affects the performance of banks, both CCB and SCB, in carrying out bank operational activities and carrying out activities as bank intermediation institutions. The bank's performance affects the level of efficiency of the bank that performs on the use of inputs to produce the bank's targeted output.

The calculated bank efficiency value shows the efficiency of the bank running during the calculation period for the performance carried out. CCB and SCB both manage bank activities by managing inputs and producing outputs proportionally to each company in setting targets to achieve efficiency levels. For this reason, with the condition of sufficiently optimal performance efforts carried out by CCB and SCB, there is no difference between the efficiency level of CCB and SCB with each having a median value or a value in the middle, namely 0.997 and 0.998 or the two banks only a difference of 0.00100 and higher in SCB efficiency. Then, if calculating based on the average efficiency in the period from January 2021 to August 2022, CCB reached an efficiency

level of 0.988 and SCB reached an efficiency level of 0.986. Then both banks can be interpreted as both being at a high level of efficiency.

The high level of efficiency achieved by CCB and SCB reflects the fairly optimal management carried out on the performance of CCB and SCB in managing all inputs owned by the bank so as to produce a targeted output that is quite optimal. However, the level of efficiency has not reached perfection or has not reached the level of 100 percent efficiency. This happens because there are several periods that do not achieve less than perfect efficiency due to the suboptimal use of bank inputs so that the targeted output is not achieved the maximum target. As in the initial CCB of the 2021 period, it has not yet reached the level of perfect efficiency and reached the level of perfect efficiency in mid-2021 and experienced a decrease in the level of efficiency again in the period 2022 to mid-2022. Then SCB experienced a stable level of efficiency at the beginning of the 2021 period and tended to fluctuate at the end of 2021, the beginning of the 2022 period SCB contracted quite high, but again experienced an increase in efficiency. August 2022 CCB and SCB achieved perfect efficiency levels with the same level of efficiency at 100 percent.

The use of capital inputs owned by CCB is the use of capital funds that exceed its target, especially at the beginning of the 2022 period. Thus, the excess use affects the CCB intermediation process which affects the achievement of outputs that do not reach the target. Meanwhile, SCB is optimal in the use of capital inputs and produces the resulting output productivity. Efforts that can be made by banks in maintaining the level of efficiency, especially CCB in optimizing the use of capital, are able to allocate excess capital use in a more productive form of assets. Thus, the excess capital does not settle and does not affect the credit given. The allocation of capital to productive assets can increase proportionally to the realization of credit given to the community and provide a higher level of profitability of the credit given. The capital adequacy of CCB and SCB can be allocated to the bank's operational use that supports operational activities. Thus, capital productively supports the profitability that can be achieved by the targeted CCB and SCB.

The use of asset inputs owned by CCB and SCB has not been optimally used optimally on a targeted basis to achieve outputs that reach the target. CCB and SCB have assets in the form of cash, current accounts, securities, placements at Bank Indonesia, and placements in other banks, as well as other fixed assets owned by CCB and SCB. Productive use of assets can affect credit and financing activities carried out by banks. Thus, the presence of unproductive assets affects the bank's performance results from credit activities and affects the bank's profitability and the influence on the quality of NPLs which causes interest expense and increases operating costs. Assets are wealth owned by banks for operational activities and credit and financing. Thus, the use of assets can not be deducted not to affect the decline in bank intermediation. However, banks can optimize overall assets productively, namely by increasing credit and financing distributed to the public.

The use of assets must be in line with the maximum income that has a positive impact on the bank. In addition, excess assets that become less efficient levels of both CCB and SCB due to lack of performance in achieving optimal output, CCB and SCB can allocate excess assets to be used in productive activities that are returns, such as purchasing securities or placing in Bank Indonesia. Thus, asset quality will be maintained and there is an increase in operating income from an increase in interest income that increases.

Third Party Funds (TPF) collected by banks as a bank intermediation process are then channeled back to the public in the form of credit and financing. However, CCB and SCB have not been optimal in the use of deposits collected, so that credit and financing have not reached the target optimally. Efforts that can be made by banks are by increasing credit and financing in order to achieve the specified target optimally. Excess deposits that are not distributed can be used productively so that they do not become deposited deposits, namely through increased credit and non-performing financing with credit restructuring. Thus, the conversion can increase the Net Performing Financing (NPF) of banks and deposits as a whole productively disbursed and can increase loans and financing disbursed.

The use of higher operating cost inputs from operating income is an influence of CCB and SCB in achieving efficiency levels that do not reach the target. Non-fixed operational costs are used to cover bank operations, transportation and other activities other than non-operational costs such as costs on credit and financing. The amount of operating costs can affect the ratio of BOPO to comparison to operating income, thus affecting the level of efficiency. The assumption of using operational costs for bank employee costs is faced by CCB and SCB. The use of these fees is distributed according to the number of bank employees. However, the use of operational costs such as those employees if not accompanied by maximum bank productivity in the short term the bank will experience a decrease in bank productivity, thus affecting the bank's profitability due to the high costs that banks continue to pay in supporting bank operations, but these expenses are not accompanied by an increase in bank productivity. in achieving the targets set by the bank.

The condition of increasing costs and not accompanied by income is in line with the concept of microeconomic production in the law of diminishing returns or the law of decreasing yield growth which states the use of inputs that are arbitrary in nature, productivity increases, but if the increase in inputs continuously, it can reduce the level of productivity. So that banks in an internal micro-study can regulate proportional to operational costs by setting a cost budget for each determination period so that the costs incurred do not exceed the set target. The determination of budget plans, both those used in fixed expenses and variable expenses, can be a reference for banks in the period of performance on the comparison of profitability achieved. Thus, it can account for the possibility of overuse of bank operating expenses which triggers bank inefficiencies due to non-optimal bank profits that are targeted.

The achievement of less than optimal output in achieving the target of credit and financing realization as well as operating income affects CCB and SCB in achieving perfect efficiency levels. The realization of credit and financing still did not reach the target due to less productive assets and deposits that have not been distributed as a whole. Efforts that can be made by banks are by increasing credit and financing products, so that banks increase in credit and financing activities, and can determine policies on restructuring for non-performing loans. The increase in loans and financing disbursed can increase operating income through interest income or profit sharing on loans and financing carried out. In addition, the use of excess costs does not provide performance results that support the increase in bank profitability. This is because the use of CCB and SCB operating costs is not constantly followed by operating income earned by CCB and SCB. Operating costs that are affected by the NPF quality of loans disbursed so that the use of costs increases and operating income does not increase due to the lack of interest income on the realization of loans and financing disbursed becomes a lack of level of perfect efficiency achieved by CCB and SCB.

Conventional Commercial Banks (CCB) and Islamic Commercial Banks (SCB) have both achieved high levels of efficiency, although CCB achieved an average efficiency rate of 0.2 percent higher than SCB. This shows the bank's good performance and can make efforts to be able to increase the level of efficiency higher in achieving the perfect level of efficiency as in the previous discussion. Efficiency that shows good performance results affects public confidence in making deposits or loans made to banks. Customer confidence in the banking industry is a major strength for banks in expanding operational activities that reflect the breadth of the banking market achieved. Thus, this trust can, as a result of CCB and SCB, can continue to improve performance and the public continues to carry out transaction activities at the two banks. Operational activities that continue to increase with funds raised by banks for inputs that are used are then channeled back through credit and financing to the public become an economics force that is supported by the financial sector and can affect the real sector or the goods and services market sector. Thus, bank financial flows are stable and affect the condition of the national economy and national financial stability on activities in the banking sector.

6. Conclusion, Limitations, and Suggestions

Conclusion

Based on the results of data processing through Data Envelopment Analysis (DEA) with the Constan Return to Scale (CRS) model with the DEAP Verison 2.1 software, conclusions can be drawn from the final results of the study, namely Conventional Commercial Banks (CCB) during the post-Covid-19 pandemic period, namely from January 2021 to August 2022, experiencing fluctuating efficiency levels. CCB did not achieve perfect efficiency at the beginning of the 2021 period and the beginning of the period until the middle of the 2022 period. Thus, CCB achieved an efficiency level of 98.8 percent. This shows that the condition of CCB after the Covid-19 pandemic has reached a high level of efficiency which reflects quite optimal in the use of inputs in performance and produces outputs that are sufficient to achieve the targets set. Then, Sharia Commercial Banks (SCB) during the post-Covid-19 pandemic period, namely from January 2021 to August 2022, experienced fluctuating efficiency levels. SCB did not achieve perfect efficiency in the mid-2021 period and the beginning of the period until the middle of the 2022 period. Thus, SCB achieved an efficiency level of 98.6 percent. This shows that SCB conditions after the Covid-19 pandemic have reached a high level of efficiency which reflects the optimal use of inputs in performance and produces outputs that are sufficient to achieve the targets set.

The efficiency level of CCB and SCB after the Covid-19 pandemic reached a relatively fluctuating level of efficiency equal to the median of 0.997500 and 0.998500, respectively. The two banks did not have a difference in efficiency level as the results of the Mann-Whitney difference test showed a calculated probability value of 0.9138 greater than 0.05. So the results of the different tests show that H_0 is accepted and H_1 is rejected, which means that there is no difference in efficiency between Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) in Indonesia after the Covid-19 pandemic. This is due to CCB and SCB both being less than optimal in managing asset inputs, deposits and operating costs and the suboptimal capital adequacy of CCB in generating credit realization output and financing as well as targeted operating income. As a result, CCB and SCB have the same range of efficiency values at the high level of efficiency achieved in the post-Covid-19 pandemic period.

Limitation and suggestions

This research focuses on measuring the efficiency of Conventional Commercial Banks (CCB) and Sharia Commercial Banks (SCB) with an intermediation approach as banks carry out activities to collect and distribute funds with the Data Envelopment Analysis (DEA) analysis model. The DEA measurements carried out are the main focus in achieving the objectives of this research formulation and pay less attention to other approaches that can be used as a more valid form in the results of the analysis presented. Then, each bank has its own policies and products in carrying out performance operations. Thus, research suggestions and discussions can be developed by subsequent researchers in order to achieve a measurable impact on each commercial bank.

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