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EFFICIENCY ANALYSIS OF BANK BUKU 4 (BANK WITH CORE CAPITAL AT LEAST RP30 TRILLION) BEFORE AND DURING THE COVID-19 PANDEMIC

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Abstract

The purpose of the study is to analyze Bank BUKU 4 Financial performance the COVID-19 Pandemic, until the years of the pandemic. The research based on secondary data, sourced from annual and finansial reports of banks in Bank BUKU 4 category along with source from www.ojk.com. Every banking companies in Indonesia are the population for this reseach. While the sample of this research are ten (10) banks that categorized as Bank BUKU 4 from 2018 until 2010 with purposive sampling technique. Data Envelopment Analysis (DEA) on non-parametric term testing used the intermediation approach become efficiency measurement method in this study. Total Assets, Deposits, Total Savings, and Operating Costs are the input variables. While the output variables contained in this study are Credit, Interest Income, and Net Income. There are two results based on this study; First, most of banks that included as Bank BUKU 4 measured to have high efficiency, although Bank Permata and CIMB have reached the level moderate in efficiency in some years. Second, the banks' efficiency in Bank BUKU 4 category has No. difference on the study period.

Keywords**: *Efficiency, Data Envelopment Analysis (DEA), Pandemic COVID-19, Bank BUKU 4***

1. INTRODUCTION

In pandemic era, banks around the world could face increased credit and default risks. A lot of closed businesses along with low of goods demand and services demand in pandemic to post-pandemic period, resulted in businesses being unable to pay their obligations. Another adverse can be seen in the lower business development of lending institutions as investment and consumption in private terms continued to decline or did not emerge on the pandemic. Meanwhile, what happens to the amount of fees used in financing financial institutions, especially banks, may increase. This is due to the depreciation of savings and lower public income during the pandemic.

Research conducted by Solihah (2021) on banking in Indonesia during 2019 and 2020 shows that banks financial performance during the era of Covid-19 pandemic, both Islamic and Conventional type of banks in Indonesia faced a substantial decline. The same results were shown by Demirguc-Kunt et al (2021) analyzed banks stock prices that went through government control measures as well as central banks that were the result of the COVID-19 pandemic. Results showed that expansionary monetary policies countries that relied on policy liquidity support for banks, as well as utilization of supporting policies on interest rates for lenders, resulted in banking industry stock prices tending to increase. Otherwise, banking sector stock prices tend to decline in countries that implemented policies of prudent monetary. Previous research examines banking efficiency in times of crisis, namely Andreas and Ursu (2016) which explains that the crisis has a positive impact on inefficiency in Europe.

Other than studies above, a research from Murharsito and Fauziah (2023) revealed that government banks in Indonesia still have a fairly good level of efficiency despite the Covid-19 pandemic.

Muharam and Erwin (2017) explained that banks with a large amount of assets tend to have a high level of Value tool Risk (VAR), so they have a high systemic risk. Systemic banks are banks with massive management of third party funds (DPK). In addition, systemic banks have a complexity of activities, which are diverse and complicated services and products. If a systemic bank experiences a disruption, it will not only jeopardize its business, but also have impacts on other banks and or institutions in general. Bank management and the government must maintain bank stability and efficiency in the urgent moments like COVID-19 pandemic.

Referring to these criteria, Bank BUKU 4 or banks with a core capital of at least thirty trillion have the opportunity to be included as systemic banks. The BUKU 4 banks include BRI, Bank Danamon, BNI, CIMB, BCA, Bank Mandiri, Bank Permata, Bank Panin, OCBC, and BTPN. This study happened to evaluate Bank BUKU 4 efficiency in Indonesia during the 2018-2021 period and the factors that determine it.

To achieve the main goals, a related analysis will be conducted using frontier based techinque of non-parametric linear programming, namely Data Envelopmet Analysis (DEA) and Panel Data Regression. The advantage of using DEA over the Stochatic Fontier Analysis (SFA) approach is defining functional relationships is not neccesary between inputs and outputs, as well as on the measurement specifications of input and output weights. Chandra et al (1998) stated that the efficiency score generated by SFA, depends on the functional form accuracy that chosen to represent the actual production function. On the other hand, Topuz (1961) stated that DEA is known to have simultaneously benefit by using various outputs and inputs that used in efficiency calculations and overall performance measurement. DEA also has the advantage of investigating efficiency changes resulting from input savings and assessing the reasons for the changes.

Kemal et al. (2021) on assessing banks financial efficiency in Egyptian Stock Exchange (CBLSE) used several models such as, Malmquist Productivity Index (MPI), super-efficiency, cross-efficiency, and BCC-I. The results show that of the 12 banks studied, with four banks marked as efficient with model of BCC-I during 2017-2019. There is only one bank that is the most efficient. In addition, MPI results revealed a financial efficiency decline due to innovation of technologies decline on the study periods. The significant factors that influence Egyptian Stock Exchange banks financial efficiency are assets and equity, based on the confirmation of the Tobit Regression results.

Li et al. (2020) measured commercial banks efficiency in China by using bootstrap-DEA. The efficiency level of the banks state-owned is higher in rural areas based on the result. However, the sensitivity of kredit risk stocks appears more in joint-stock.

Kwateng et al. (2020) have done a study about internet banking impact on banking performance with DEA and Principal Component Analysis (PCA) in Ghana. The processing showed that bank performance in Ghana excels due to internet banking integration. Meanwhile, failure in the internet banking strategy is sought in achieving higher profits.

Ben-Abdullah and Al-Taher (2020) study implemented DEA with input-oriented term in measuring 13 commercial banks efficiency in Sudan. Based on the result, six banks that technically achieved overall efficiency, six banks have not achieved efficiency, and one bank has only achieved efficiency at the scale level.

Wasiaturrahma et al. (2020) compared and analyzed Indonesian bank, BPR (in conventional and islamic form), by using CCR and BCC-DEA. The study results in the assertion that both banks

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are not intermediation efficient, but production efficient. There is a positive influence between location ratio and adequated capital on both approaches efficiency.

Goyal et al. (2019) compared and finalized the 66 public, private, and foreign banks efficiency in India by developing a DEA approach with meta-frontier directional distance function. The results of the study showed that the efficiency level of banks reached 37.44%. Indian state-owned banks were found to have the lowest efficiency levels. The first order came for when foreign banks, and then private banks in India.

2. IMPLEMENTATION METHOD

Descriptive method and quantitative approach is the main methods for this study. Secondary data come from financial statements (balance sheets, by the income statements part) of the Financial Services Authority (OJK) are the sources of the study's data. The research ultilize a time series (2018-2021) and cross section combination data (BNI, PANIN, BRI, CIMB, Bank Mandiri, BCA, Bank Danamon, Bank Permata, OCBC, and BTPN), Panel Data. To do a comparison, the researchers took data for a period of 2 years before COVID-19, and 2 years in the COVID-19 situation. Data Envelopment Analysis (DEA) is the method of analyze tool that will measure banks of Bank BUKU 4 category efficiency. DEA is a mathematical calculation method that used in measuring the efficiency level of relativation of one to another decision-making unit (DMU), with multiple inputs and multiple outputs. The basic assumption of DEA is the extreme point method. Suppose bank A produces Y (A) units, using X (A) units of input, and other banks will do the same if they run efficient production. In other words, if bank B is able to produce Y (B) units with X (B) units of input, then other banks can also do the same. Then the banks are grouped into composite banks with composite output and composite input where they produce maximum capacity and have no real form called virtual producers. Comparative Analysis of Efficiency Before and During COVID-19 using simple regression analysis.

Table 1 Variable of Inputs and Outputs

Variabel	Unit	Sources
Input		
Total assets	Rp 000	Balance sheet
Deposit	Rp 000	Balance sheet
Savings	Rp 000	Balance sheet
Other operational expenses	Rp 000	Income statement
Output		
Credit	Rp 000	Income statement
Net income	Rp 000	Income statement
Interest income	Rp 000	Income statement

This research will use the intermediation approach. The reason for choosing this approach is due to the main character of banks which are often interpreted as financial intermediation institutions rather than public fund-raising institutions. This is also based on previous studies that have used the intermediation approach more widely.

Based on the intermediation approach, there are four input variables and three output variables in this research. The input variables are total assets (Kamel et al. (2021); Kwateng et al. (2020); Khan and Shireen (2020); Alwabel (2019); Chaluvadiet al. (2018)), total deposits (Lie et al (2019); Hasan, (2019), Jreisat et al (2018)), savings (Lie et al (2019), and other operating expenses

(Ben-abdallah and Al-Taher (2020); Goyal et al (2019)). Output variables include loans (Ahwabel, 2019), net interest income (Goyal et al., (2019); Achi (2021)), and net income (Jreisa et al,. 2018).

3. RESULTS AND DISCUSSION

Based on the estimated efficiency results, BUKU 4 banks in 2018 show that all banks are at optimal efficiency. In 2019 and 2020, there are as many as eight banks obtaining optimal efficiency. Meanwhile, two other banks, namely CIMB and Bank Permata, did not obtain optimal efficiency. There is only one bank that does not obtain efficiency (Bank Permata) in 2021. While the other nine banks are at optimal efficiency.

Table 2. Estimated Efficiency results of Bank BUKU 4 in 2018-2021

Bank	2018	2019	2020	2021
BRI	100	100	100	100
MANDIRI	100	100	100	100
BCA	100	100	100	100
BNI	100	100	100	100
CIMB	100	95	96	100
PANIN	100	100	100	100
DANAMON	100	100	100	100
PERMATA	100	80,2	80,5	73,1
BTPN	100	100	100	100
OCBC	100	100	100	100

Source : Data processed with Software BANXIA (2022)

Based on the processing results, Bank Mandiri, BRI, BNI, BCA, Panin, Danamon, OCBC, and BTPN are at high efficiency with an optimal score of 100 percent during 2018-2021. Whereas in 2019, Bank CIMB (total efficiency score of 95%) must reduce the use of total assets by 9%, deposits by 5%, savings by 5% and other operating expenses by 5%. Instead, CIMB must increase its net profit by 29%. In 2020, CIMB obtained an efficiency score of 96% which required a reduction in the use of total assets by 4%, deposits by 6%, savings by 4% and other operating expenses by 4%. Conversely, credit must be increased by 17%. Bank Permata earned 80.2% in 2019, so it must reduce the use of total assets by 19%, deposits by 19%, savings by 30%, and other operating expenses by 19%. On the other hand, net income must be increased by 45%, and interest income by 40%. In 2020, Bank Permata obtained a score of 80.5%, which required a reduction in the use of total assets by 19%, deposits by 26%, savings by 19%, and other operating expenses by 19%. Conversely, net profit should be increased by 1%. Bank Permata obtained an efficiency level of 73.1% in 2021. This results in the need to reduce the use of total assets by 26%, deposits by 27%, savings by 26%, and other operating expenses by 26%. Bank Permata must increase output spending through an increase in net profit by 62% and interest income by 1%.

Kurniawan (2020) in his article entitled "Shopping, Savings, Pandemic, and Economy", explains that the upper middle class has concerns about the economic outlook so they prefer to allocate their funds for sudden expenses by keeping their money in the bank. Based on LPS data, the total value of deposits until the end of September 2020 increased 23% compared to the same period in 2019. The amount reached 6,721 trillion rupiah.

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Table 4.6 below presents a summary of the Linear Regression Test used in testing differences in efficiency before and during COVID-19 in Bank BUKU 4.

Table 3 Difference Test Using Linear Regression

Variable	B	Significant (α=0,05)
COVID-19	-1,2800	0,505

Source : Data processed with SPSS 25 (2022)

The result in table 3 show a significant value of 0.505 is obtained, which means that difference is on Bank BUKU 4 efficiency from the year prior to the COVID-19 period. A study of banks efficiency comparison in Indonesia before and during COVID-19 was also conducted by Sholihah (2021). Study results have proven that efficiency level in sector of banking, both Conventional Commercial and Islamic Commercial, faced substantial shrinkage during the COVID-19 pandemic. However, when viewed from the Bank BUKU 4 category, the average Indonesian Bank BUKU 4 is at a medium and high level of efficiency. This may also indicate that the Indonesian economy will recover, followed by policies and stimuli issued by the government such as Government Regulation (PP) Number 43/2020, the revises of PP Number 23/2020 concerning the National Economic Recovery Program Implementation for Handling the COVID-19 Pandemic Supporting Policies. All healthy banks have access and distribute to the National Economic Recovery funds (PEN). Based on research conducted by Aryani (2021), the results of the health analysis of Bank BUKU 4 show that BCA is in a "Very Healthy" condition, both before and during the pandemic. Then BRI, BNI, Mandiri, CIMB Niaga, Panin, and Danamon are in a "Healthy" condition, both before and during the pandemic.

As stated by Candra Fajri Ananda, Indonesian Minister of Finance Special Staff, the government placed funds worth IDR123.46 trillion in banks as a stimulus for the Covid-19 business recovery of MSME debtors. The policy is retrieved to increase bank lending and become a liquidity buffer for implementing banks. Throughout 2021, economic growth (GDP) in Indonesia has reached of 3.69 percent, higher than the contraction on 2020 (Hayati 2022).

4. CONCLUSION

Indonesia COVID-19 pandemic outbreak bring massive impacts on almost every life sectors, such as economic, political, social to cultural aspects. The banking sector, which is the heart of a country's economy, is also affected. Measurement of banking efficiency, especially Bank BUKU 4, is very important during the COVID-19 pandemic situation. This is due to the important role of Bank BUKU 4 for keeping financial system stability. Based on the measurement of Bank BUKU 4 efficiency financial performance on 2018-2021 period, the following results were obtained:

1. In terms of Overal Technical Efficiency (OTE), there are eight banks that obtained optimal efficiency (score 100) during 2018-2021, including BRI, BNI, BCA, Mandiri, Danamon, BTPN, Panin, and OCMB. While the other two banks, namely CIMB in 2019 and 2020 and Bank Permata in 2019-2021, did not have optimal efficiency. Based on testing with Pure Technical Efficiency (PTE), there are nine banks that are efficient during 2018-2021, including BRI, BNI, BCA, Mandiri, Danamon, BTPN, Panin, OCMB, and CIMB. Meanwhile, Bank Permata did not obtain optimal efficiency in 2021. In terms of Scale Efficiency (SE), there are eight banks that obtained optimal efficiency (score 100) during 2018-2021, including BRI, BNI, BCA, Mandiri, Danamon, BTPN, Panin, and OCMB. While the other two banks, namely CIMB and Bank Permata in 2019-2021, did not have optimal efficiency.

2. Results for the different Bank BUKU 4 efficiency test before and during the pandemic shows nothing different.

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