

# Profit Efficiency and Factors Affecting Indonesia Banking

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**Abstract.** Amid uncertain global economic conditions, Indonesian banks are showing a good increase in performance based on increased profitability up to the end of 2019. This research measures the efficiency of profit using the Stochastic Frontier Analysis (SFA) by using the translog Alternative profit Efficiency model. The model's equation uses the Bank Activity Approach. The measurement results based on average 8 commercial banks are not efficient. Bank size (total assets), bank capital (CAR), bank liquidity (LDR), and bank credit risk (NPL) significantly affect the level of profit efficiency.

**Keyword:** *efficiency profit, bank size, capital, liquidity, credit risk*

## INTRODUCTION

Increasingly, Indonesia's economic situation amid the turmoil of the world economy is not sure to be one of the good information for the nation of Indonesia. Serving as a decision-maker, Bank Indonesia strives to maintain its economic state while maintaining the benchmark interest rate at 5%. The interest rate Deposit Facility (DF) survives at 4.25% and the lending facility interest rate is 5.75 [1].

The development of banking performance until the end of 2019 is one of the indicators to better the banking conditions in Indonesia. The performance increase was in the description of several public banks such as PT Bank Rakyat Indonesia (PT. BRI) to gain net profit of Rp. 34.4 trillion by the end of 2019. The amount of credit channeled by PT. BRI throughout the year 2019 amounted to Rp. 908.8 trillion. It increased by 8.44% compared to 2018, above average industry credit growth of 6.08%. Bank Mandiri, profit growth throughout the year 2019 increased by 9.9% compared to the year 2018. Consolidated credit growth of 10.7% (YoY). Credit growth amounted to 10.7 (YoY) to reach Rp. 907.5 trillion in 2019. Net interest income of Rp. 59.4 trillion, increased by 8.8% (YoY) compared to 2018. PT. BNI, TBK scored a profit of Rp. 15, 38 Tirlu during the year 2019. The achievement increased by 2.5% compared to the previous year of Rp. 15.02 trillion. Net profit growth is 10.3% (YoY) from position Rp. 13.62 trillion by the end of 2017. The achievement was sustained by an increased credit distribution of 8.6% YoY, giving the effect of Net

Interest Income (NII) a rate of 3.3% compared to the year 2018 [1], [2].

The escalation of profit and bank performance is one of the efforts in the management of third-party funds in the welfare of the company's owners in helping increase economic growth. Measurement of the level of efficiency in managing third party funds and other funding sources used in gaining profit becomes one of the important indicators. Efficiency is a measure that demonstrates how well the economic resources are used in the production process to produce the output [3]. The relatively high liquidity rate of the relatively increasing Loan to Deposit Ratio (LDR) encourages banking to increase the growth of third-party funds by raising deposit rates [1].

Banking resilience is also maintained supported by the relatively high capital of banks and the risk of credit and liquidity risks. Capital resilience of banks is still relatively high, reflected by CAR in the trend increased to 22.53% in the first semester 2019 [2]. In composition, bank capital is still dominated by Tier 1, which is the most high-quality modal component that can be used to absorb risk quickly. The banking strategy of withholding credit rate hikes is an effort to maintain credit expansion amid increased competition to obtain qualified debtors and contribute to maintaining national economic growth.

The more efficient the banking sector contributes to its relatively high profitability in the midst of slowing down credit growth as reflected in Return On Asset (ROA) at the highest level in the last 3 years. Profitability is still maintained at a level above 2%, reflected from the ROA banking of 2.47% in the first semester of 2019 only decreased thinly from 2.5% in semester II 2018 [1].

As a company, banks have the aim to achieve economic profit as much as possible, so that the company makes the most margin possible between total revenue with the total economic cost. The effect of profit maximization is assumed as a driving ground goal of the decision made by the company [4]. Measurement of profit efficiency has taken into account the inefficiency of both the input side and the output side, the difference with the cost efficiency measurement emphasizes on the input side when the inefficiencies from the output side may be the same or can be greater than the input side inefficiency [6]. The advantages of using profit efficiency include allowing the measurement of

inefficiencies in the output side equal to the inefficiency measurement based on the input side and reducing the problems associated with specifying and measuring input and output variables [5].

The purpose of this research first measured the efficiency of Indonesia's banking profit as empirical research conducted by previous researchers [7]-[12]. Secondly, analyzing factors that affect profit efficiency [13]-[17]. These factors consist of: first, Bank size. A proxy-based on the total assets owned by the bank consists of deposits. Deposits by the bank are used for cash assets, total loans, and total securities [11], [22]-[24]. The number of assets collected by banks is a determinant of bank size is big or small. Large-sized banks are more competitive than small banks. Because small banks do not have the power to change the economic condition [25]. Large-sized banks are likely to obtain capital at a lower cost because they are derived from the results of the diversification of banks. So the bigger the bank size is increasingly efficient [22]. Second, capital adequacy. Capital must be sufficient to fulfill the basis as a reserve fund when experiencing financial and operational risks as well as the funds required to regulate operating a financial company before another source of funds is compiled [22].

Based on the results of previous research, the capital affects profit efficiency [7], [8], [14]. 3). Third, liquidity. The success of the bank in managing liquidity can be known through the bank's ability to predict the need for future funds and the ability to fulfill its obligations without having to withdraw its assets into cash [26]. Bank liquidity is measured based on the Loan to Deposit Ratio (LDR). If the value is high, it means that banking does not have enough liquidity to fulfill its obligations towards the customer and increase the risk of credit amount. If the value is too low banking has sufficient liquidity but the spread based income is lower [7], [8], [22], [26]-[28]. Fourth. Bank credit risk. These risks reduce the ability of the bank to meet its obligations or impact liquidity risk. Another result is to reduce the profit gain because credit risk is the risk of not returning bank funds which are channeled in the form of a credit to the public either part or all by existing credit agreements [7], [8], [16], [29],

METHOD

This research uses a parametric approach to measure profit efficiency. Measurement of profit efficiency using the selected public bank samples based on the terms of the 10 banks that have the largest total assets and have a financial report consecutively from the year 2010-2019. Of the total of 10 banks that have the largest asset, only 8 banks that have a complete financial statement from the year 2010-2019 namely 4 government-owned public banks (Bank Mandiri, BNI, BRI, BTN) and 4 Bank general private foreign exchange (BUKOPIN, BCA, MAYAPADA, MEGA)

Measurement of profit efficiency using the Alternative Profit Efficiency approach. The Bank will maximize the profit by selecting the output price (p) and the number of inputs (x), for several outputs (y) and the input price (R). Indirect profit alternative function is the solution of optimization problems with the equation, where and [19].  $Max \pi_{p,x} = P'Q = (p, w)(y - x)'s, t, g(p, y, w, z) = 0h(y, x) = 0$

The profit efficiency measuring model uses the development of the Activity Bank Approach model by using the Alternative Profit Efficiency model Translog. Activity Bank Approach Measures all Bank activities that make a profit. The similarities are as in Figure 1 [7], [8].

Where.:  $\pi_n$  Total profit bank n, =  $w_i$  price of bank input i, i.e. Labor price ( $w_1$ ), physical capital Price ( $w_2$ ) and interest cost price, = amount of credit on bank  $y_{ki}$  i,  $A_i$  = Number of other earning assets excluding Bank banking intermediation function i,  $z_{ln}$  = input or output factor that affects profit efficiency, =  $u_{\pi}$  controllable (random) factor that describes inefficiency factor so as to decrease the profit of a bank under Best Practice Banker's profit, =  $v_i$  uncontrollable factors or noise term.

The input-output determination used in the model uses an intermediation approach. The intermediation approach is more appropriate to evaluate the entire bank compared to the production approach [20] and can evaluate the importance of the efficiency frontier to the probability of minimizing the total cost (not just production costs) required to maximize profit [21].

The Input variable used is salary cost ( $w_1$ ), operational cost minus salary fee ( $w_2$ ), interest expense ( $w_2$ ). The Output variable consists of the amount of credit ( $y_k$ ) and the number of other assets

$$\begin{aligned} & \ln[(\pi) + |(\pi_{min}) + 1|] \\ & = \beta_0 + \beta_{w1} \ln(w_{1i}) + \beta_{w2} \ln(w_{2i}) + \beta_{w3} \ln(w_{3i}) + \beta_k \ln(y_i) + \beta_A \ln(A_i) \\ & + \frac{1}{2} \beta_{w11} \ln(w_{1i})^2 + \frac{1}{2} \beta_{w22} \ln(w_{2i})^2 + \frac{1}{2} \beta_{w33} \ln(w_{3i})^2 + \beta_{w1y} \ln(w_{1i}) \ln(y_i) \\ & + \beta_{w2y} \ln(w_{2i}) \ln(y_i) + \beta_{w3y} \ln(w_{3i}) \ln(y_i) + \beta_{w1A} \ln(w_{1i}) \ln(A_i) + \beta_{w2A} \ln(w_{2i}) \ln(A_i) \\ & + z_{in} + v_{a\pi} - u_{a\pi} \end{aligned}$$

Figure 1. Similarities

such as investment funds in both Rupiah and foreign exchange in the form of securities, the placement of interbank funds ( $y_k$ ).

Factors that affect the efficiency of profit consist of: Bank size based on Total Asset owned bank ( $z_{1n}$ ), bank capital ( $z_{2n}$ ), measured by Capital Adequacy Ratio (CAR), bank liquidity measured ( $z_{3n}$ ) based on Loan to Deposit Ratio (LDR), bank risk ( $z_{4n}$ ) is measured based on Non-Performing Loan (NPL)

**RESULT & DISCUSSION**

Based on the results of processed data using Stochastic Frontier Analysis (SFA) Frontier 4.1 The average result of profit efficiency throughout the year of research 2010-2019 is reflected in Figure 2. Overall the profit efficiency amounted to 0.464. It means that overall the performance of the bank in managing its inputs in generating inefficiency profit. The average bank has not been able to maximize input management in maximizing profit.

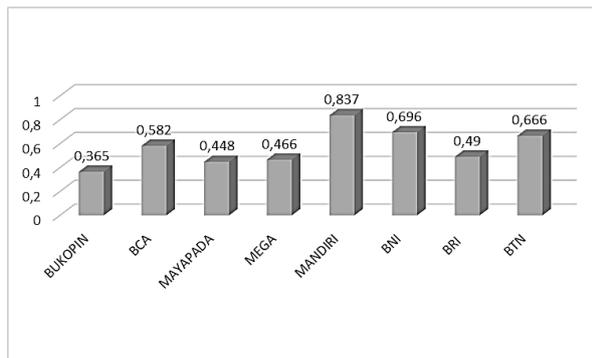


Figure 2. Average Profit efficiency 2010-2019

Figure 2, describing that Bank Mandiri, BNI, BTN, and BCA are more efficient than Bank BUKOPIN, MAYAPADA, MEGA, and BRI. BRI Bank has the lowest profit efficiency rate compared to the other banks. This means that with an increase in the amount of credit in the year 2019, it is not yet able to maximize the profit generated. If based on BRI bank size is the same size as BNI, BRI, and BTN. The logarithmic value of bank size BRI, BNI, and Bank Mandiri amounted to 33, Bank BTN amounted to 27.31. Bank BUKOPIN by 27, BCA of 29, MAYAPADA amounted to 25, MEGA amounted to 27.

Table 1, indicating that Bank size ( $z_1$ ), bank capital ( $z_2$ ), bank liquidity ( $z_3$ ), bank credit risk ( $z_4$ ) are significant at a level of 5% (1.96). The result of the estimated factors of profit efficiency as follows :

Bank size ( $z_1$ ), significantly affects the efficiency of bank profit. The negative effect means that the smaller the total assets that have become increasingly inefficient. This is due to the small size of the bank which has a smaller funding source so that the ability to compete to carry out the

intermediation function as a credit dealer is lower than that of large-sized banks.

Table 1. Frontier Data Results in 4.1

Variable	Coefficient	Standard Deviation	t Ratio	Signifikan
BANK SIZE ( $z_1$ ) $\delta_1$	0,0345	0,0255	-2,2763	Negative, Significant
CAR ( $z_2$ ) $\delta_2$	-0,0087	0,5178	-4,5789	Negative, Significant
LDR ( $z_3$ ) $\delta_3$	-0,0023	0,1087	2,3295	Positive, Significant
NPL ( $z_4$ ) $\delta_4$	0,0093	0,0038	2,4182	Positive, Significant

Source : processed data, 2020  
Note : Level of Significant 5%=1,96

Capital Bank - CAR ( $z_2$ ), significantly affects the efficiency of bank profit. Negative effect means if CAR inefficiencies higher profit decreases. The higher the CAR, the higher the efficiency of profit. Based on the capital function, the more bank capital, the growth of the bank will be better even though the amount of capital has exceeded the rules stipulated by the authority or by Bank Indonesia. Serves as a reserve fund when the bank is experiencing a bad credit risk or is required to regulate operating a financial company before another source of funds is collected.

Bank liquidity - LDR ( $z_3$ ), significantly affecting bank profit efficiency. The positive effect is meaningful if LDR the higher the profit inefficiencies are getting higher. The higher the LDR the more profit decreases efficiency. Liquid deposits are required by the bank, but the amount must be adjusted to the needs. If the funds in large amounts will result in a declining profit level so that the profit efficiency decreases. The bank must have the ability to predict the needs of the required funds so that bank-owned funds can be managed properly.

Bank credit risk -  $npl$  ( $z_4$ ), significantly affecting bank profit efficiency. The positive effect is meaningful if the NPL is getting higher inefficiencies higher profit. The higher the NPL, the more profit decreases efficiency. Bank credit risk is the risk of not returning funds channeled by banks in the form of credits. So it is not a bigger cost that will reduce the profit of the bank. Not good NPL ratio management will result in decreased profit efficiency.

Based on the results of the above analysis concluded that bank size, bank capital, liquidity, and credit risk banks are factors that affect the efficiency of the bank. Based on the average calculation of efficiency, the eight banks during the year 2010-2019 are inefficient. This means that overall the ability of the bank to manage the assets and capital that have Keseluruhan not maximal. The amount and management of liquid funds are not maximized. Excess liquid funds will incur losses on the bank. The amount of credit that started to be stuck will

give a negative effect on bank profit gain. The higher the NPL will reduce the level of profit efficiency.

Based on the ownership and bank size, BRI, BNI, Bank Mandiri, and BTN are the same size. But BRI has the lowest profit efficiency compared to the other three banks. This indicates that BNI, BTN, and Bank Mandiri have better performance in managing capital, bank liquidity, credit risk level, and bank input that is owned compared to BRI. Similarly, with the ownership of public bank foreign exchange.

### CONCLUSION

Based on the results data analysis can be concluded that 1). On average the performance of banks is categorized inefficiently during the year 2010-2019. The Bank must improve the channeled credit management capability as well as the input that belongs to labor cost, operational cost, and interest expense. 2). Bank size, capital, liquidity, and Bank credit risk are factors that influence the efficiency of the bank profit.

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