

Cost Efficiency in The Banking Industry

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ABSTRACT

This study aims to analyze cost efficiency in conventional banking. The data of this study consists of 23 banks in Indonesia period 2009-2017. The research method is the Stochastic Frontier Approach (SFA) model. The results show that foreign exchange private banks are the most cost-efficient. State-owned commercial banks are not yet cost-efficient banks. Bank cost efficiency is determined by labor costs and interest costs. Higher labor costs and interest costs will increase the total cost of conventional banking. The results of this study will be useful for the banking industry to improve cost efficiency by controlling labor costs and interest costs. The implication of this research is that the government needs to improve cost efficiency at state-owned banks and reduce labor costs and interest costs with the aim of increasing banking cost efficiency.

Keywords : **Conventional bank; Cost Efficiency; Labor Cost; Interest Cost; Stochastic Frontier Approach**

ABSTRAK

Penelitian ini bertujuan untuk menganalisis efisiensi biaya pada perbankan konvensional. Data penelitian ini terdiri dari 23 bank di Indonesia periode 2009-2017. Metode penelitian yang digunakan adalah dengan menggunakan model Stochastic Frontier Approach (SFA). Temuan penelitian menunjukkan bahwa bank swasta devisa paling hemat biaya. Bank umum milik negara belum termasuk bank yang efisien biayanya. Efisiensi biaya bank ditentukan oleh biaya tenaga kerja dan biaya bunga. Biaya tenaga kerja dan biaya bunga yang lebih tinggi akan meningkatkan total biaya pada perbankan konvensional. Hasil dari penelitian ini akan berguna bagi industri perbankan untuk meningkatkan efisiensi biaya dengan mengendalikan biaya tenaga kerja dan biaya bunga. Implikasi dari penelitian ini adalah pemerintah perlu meningkatkan efisiensi biaya pada bank BUMN serta menekan biaya tenaga kerja dan biaya bunga.

Kata Kunci : **Bank Konvensional; Efisiensi Biaya; Beban Tenaga Kerja; Beban Bunga; Pendekatan Stochastic Frontier**

INTRODUCTION

Efficiency is one of the most critical concepts in industrial, financial performance, included in the banking industry. Bank efficiency has been substantial research in the last 20 years. However, the field of banking efficiency had low productivity, without a significant number of prolific specialized researchers (Abreu *et.al*, 2019).

Efficiency is often closely linked to how banks produce larger outputs with smaller inputs. Efficient banking generally has substantial total assets and strongly influenced by bank size (Mongid & Muazaroh, 2017). Besides, efficient banks will be able to provide credit at a lower cost. It is because the bank has low pressure when getting the most profit from a higher net interest margin.

Cost efficiency also depends on bank ownership management. Banks with private ownership have better cost efficiency than state-owned banks (Yannick *et.al*, 2016). Another studies showed that foreign banks have higher cost efficiency and profit efficiency (Ngan, 2014; Banerjee, 2012). Beside ownership management, the condition of internal banking conditions. Anwar (2019) explains that efficiency shows how banks can obtain greater or equal income from smaller expenses. Expenses and income are the main factors that affect efficiency (Linghe, 2012). Overall, labor and profit-sharing expenses have a positive and significant to total cost. Total financing has a negative and significant to total cost.

State conditions can also affect cost efficiency in banking. Mongid & Muazaroh (2017) found that large banks in the ASEAN region tended to be more efficient than small banks. It is because total assets and bank size also influence efficiency. For example, Singapore countries have higher cost effective than other countries in the ASEAN. State conditions will affect cost efficiency in banks through government policies which adopted in the economy.

Banks must be able to carry out their operational activities efficiently (Puteh *et.al*, 2018). Banking operational activities include funding and credit. These banking operations must meet the criteria for health indicators from Bank Indonesia. The Government regulates Risk-based bank health indicators from Bank Indonesia in PBI Number 13/1 / PBI / 2011 Article 2. This regulation explains that banks are required to assess bank health based on a risk approach (Risk Based Bank Rating / RBBR). This RBBR method includes four factors according to BI Circular No.13/24/DPNP,i.e. risk profile, Good Corporate Governance (GCG), earnings, and capital (Junaeni, 2016).

The risk profile is seen using the NPL/Non-Performing Loan ratio (credit risk), and LDR/Loan to Deposit Ratio (liquidity risk). GCG is seen based on self-assessment; namely, banks are valued according to their rank. Earning is seen using the profitability ratio (ROA) while the capital of the capital adequacy ratio (CAR). Based on these criteria banks are healthy if the NPL ratio is <5 percent, LDR <85 percent, ROA \geq 1.25 percent, and CAR > 8 percent (Junaeni, 2016).

Based on Indonesian banking statistics for December 2017 showed that there had been an increase in third-party funds from Rp 4,630,352 M in 2016 to Rp 5,050,984 M in 2017. This increase in third-party funds was followed by an increase in expenses and costs of third-party funds. Conversely, the distribution of third-party funds which constitute income from banks moves lucratively. From 2014 to 2015 there was a significant increase in the distribution of funds, from 89.42 percent to 92.11 percent. From 2015 to 2017 there was a decrease in bank funding from 92.11 percent to 90.04 percent. It means that there is a decrease in bank credit.

Efficiency according to the traditional approach, BOPO, shows that the level of banking efficiency still lacks because in 2016 the average BOPO of Conventional Commercial Banks is 82.22 percent. The ideal BOPO according to BI regulations is 60 percent-80 percent. BOPO turns out to be in line with the bank's core capital (Hosen & Rahmawati, 2016). Banks with substantial capital tend to have lower BOPO than banks with small capital. Based on the description above, the research objectives in this study analyze the level of cost efficiency in Conventional Banks and analyze the determinants of cost efficiency in Conventional Banks.

Efficiency is a healthy indicator of banking performance (Lutfi & Suyatno, 2019). Banks that have good performance tend to be able banks. In financial ratios, the level of banking efficiency is identified with BOPO (operating costs on operating income), which means a comparison of operating costs to operating income. However, BOPO is a financial ratio that shows the efficiency of operations with a traditional approach.

Efficiency is measured through two approaches, the traditional approach (BOPO) and the frontier approach. In this study, the measurement of cost efficiency in banks does not use the BOPO ratio but uses input and output components in banks that can interpret the extent of cost efficiency in banks. The frontier approach includes many things, namely deterministic approach (non-parametric approach usually uses DEA) and stochastic approach (parametric approach usually uses SFA) (Fiorentino, Karmann, and Koetter, 2006).

Based on the concept, efficiency can be divided into three types, namely cost efficiency, profit efficiency, and alternative profit efficiency (Berger & Mester, 1997). However, according to Linghe (2012), the concept of efficiency is only divided into two types, namely cost efficiency and profit efficiency. The high competition in the banking industry requires banks to be able to achieve maximum profit with minimal costs. If the bank wants to increase profits by increasing NIM (net interest margin), the bank is less able to compete with other banks which can increase profits by not raising loan interest rates (Mongid & Muazaroh, 2017).

Efficiency is a comparison between output and input (Anwar, 2019). In this case, a company is said to be efficient if it can produce a more prodigious output using the same or smaller input. A bank is said to be efficient if (1) can obtain a more prodigious output by using the same input (2) can obtain the same output by using smaller inputs (3) can obtain a more prodigious output using more substantial inputs (Firdaus & Hosen, 2014).

In determining the input and output components, three approaches can be made (especially in the banking world), namely (1) a production approach, namely seeing banking as a producer of savings and loans. In this approach, the input component includes expenses while the output component includes revenues. (2) The intermediation approach, which is to see banking as an intermediary institution that converts financial assets from surplus units to deficit units. In this approach, the input component includes expenses while the output component includes total loan loans and financial investment assets. This approach will be used in this study. The standard approach is employed for one reason. The researcher concerned with how cost-efficient the bank is as a financial intermediary in channeling funds from depositors to borrowers (Miah & Uddin, 2017) (3) An asset approach, namely seeing banking as a financial institution that provides loans. The asset approach is almost the same as the intermediation approach that puts assets as an output component (Aiello & Bonanno, 2013).

The background in this research is about the importance of cost efficiency in banking. According to (Anwar, 2019), banking cost efficiency in Indonesia tends to decline. Especially in banking with government ownership. The hypothesis in this study is two.

The first, state-owned commercial banks are classified as cost efficient. Cost efficiency is calculated using the total cost. The second hypothesis is that total costs are positively influenced by labor costs, interest expenses, total loans, and total securities.

The formulation of the problem taken in this study is how the level of cost efficiency in banking with foreign exchange banks and state-owned banks. In addition, is the level of cost efficiency in private foreign exchange banks higher than in BUMN foreign exchange banks? This research contributes to the banking sector, especially banks with foreign exchange and non-foreign exchange types, both government and private.

RESEARCH METHOD

The data used in this paper is a panel data of conventional banks from 2009 to 2017. Data is taken from the Financial Services Authority (OJK). The main databased in this research is Bank scope, and the balance sheet and income statement of 23 banks from 2009 to 2017. Data includes 4 state-owned commercial banks (SOCBs) and 12 foreign exchange banks (FEBs), 7 non foreign exchange banks (NFEBS). The sampling method used is purposive sampling with the financial report criteria available in full.

The study used SFA (Stochastic Frontier Approach) method to measure cost efficiency (Anwar, 2019). SFA is developed by Aigner, Lovell and Schmidt (1977) and applied to banks by Ferrier and Lovell (1990). SFA cost efficiency is used considering that in the measurement of cost or economic efficiency of a bank, it involved input prices and output quantities in the model. Trans log-function for the total cost as an objective of the function along with some outputs and prices of inputs variables is used in this study (Khalifaturafi'ah, 2021).

The study presents the variables in a logarithm form. The model uses total cost (TC), price of labor (P1), price of borrowed funds (P2), total loans (Q1), total securities (Q2). Total cost is a dependent variable while the others is independent variable (input and output). The input prices employed in this study are price of labor and price of borrowed funds. The output quantities are total loans and total securities. In this study use an intermediate approach to measure input and output for cost efficiency. Variable definitions for cost efficiency are shown in Table 1.

Table 1. Variable definitions of Research Sample

Variables	Name	Variable	Description
LnTC	Total Cost	Dependent Variable	Sum of interest cost and general operating expenses
Ln(P1)	Price of Labor	Input Prices	Personnel expenses
Ln(P2)	Price of borrowed funds	Input Prices	Interest expenses
Ln(Q1)	Total Loans	Outputs	Loans to customer
Ln(Q2)	Total securities	Outputs	Sum of loans to other bank, equities, and bond

Source: Processed Data, 2020

The SFA method is used to answer the first question about cost efficiency. The value of cost efficiency is optimum if banking efficiency equals 100%. To estimate the stochastic frontier model, it is needed to assume the functional form as follows

$$\text{LnTC} = a + b_1\text{Ln}(P1) + b_2\text{Ln}(P2) + b_3\text{Ln}(Q1) + b_4\text{Ln}(Q2) + e \quad (1)$$

Here, to estimate cost efficiency from the SFA approach, The author used frontier 4.1. The research framework is showed in Figure 1.

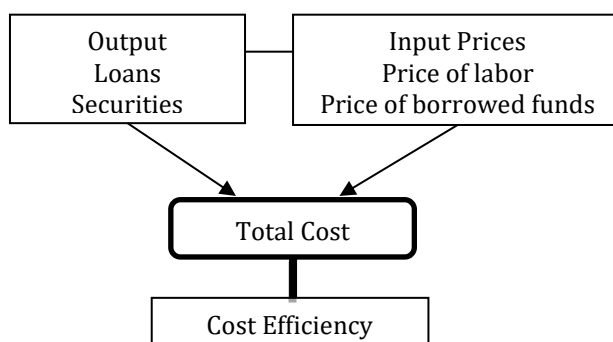


Figure 1. Research Framework

RESULT AND DISCUSSION

This study uses annual financial report data. The data is derived from banking publication reports that have been published through the OJK. The sample research were conventional commercial banks namely state-owned commercial banks (4 banks), foreign exchange banks (13 banks), and non-foreign exchange banks (6 banks) (Table 3). The data is from 23 banks period 2009-2017, so 207 observation is collected. Research sample is summarized in Table 2.

Table 2. Research Sample

No	Conventional Banks	Type of Bank
1	Mandiri	State-owned bank
2	BNI	State-owned bank
3	BRI	State-owned bank
4	BTN	State-owned bank
5	BTPN	Foreign exchange bank
6	BCA	Foreign exchange bank
7	CIMB Niaga	Foreign exchange bank
8	Danamon	Foreign exchange bank
9	Mayapada	Foreign exchange bank
10	Maybank	Foreign exchange bank
11	Mega	Foreign exchange bank
12	OCBC NISP	Foreign exchange bank
13	Permata	Foreign exchange bank
14	Rabobank	Foreign exchange bank
15	Sinarmas	Foreign exchange bank
16	UOB	Foreign exchange bank
17	Bukopin	Foreign exchange bank
18	Kesejahteraan Ekonomi	Non foreign exchange bank
19	Ina Perdana	Non foreign exchange bank
20	Jasa Jakarta	Non foreign exchange bank
21	Sahabat Sampurna	Non foreign exchange bank
22	Yudha Bakti	Non foreign exchange bank
23	Harda internasional	Non foreign exchange bank

Source: OJK, 2020

In this study, efficiency is calculated using the stochastic frontier approach (SFA) with an intermediate approach (Kumar, 2018). In an intermediate approach, the input variables

are the price of labor and price of borrowed funds. The explanatory variable is total Cost (TC). The outputs are loans and securities. All variables both explanatory variable and independent variables are converted into logarithm to fulfil the frontier software requirement.

The results of the descriptive statistics are summarised in Table 3. Overall, all variables are good, and the data of Indonesian banking is quite homogenous. It is from the value of standard deviation which less than the value of the mean from Table 3. It is more difficult in explaining variables with natural logarithm. However, in sum, the average of loans is the highest among other variables.

Table 3. Descriptive statistics

	Variable	Mean	Std Dev	Min	Max
Dependent	LnTC	15.07851	1.843840	11.03015	18.21017
	LnP1	13.31903	1.913290	9.507255	17.10845
Input	LnP2	14.36724	1.687704	10.58000	17.14145
	LnQ1	17.07543	1.923659	13.10980	20.37797
Output	LnQ2	15.04028	2.172362	9.458138	18.93841

Source: Processed Data (Data is in natural logarithm), 2020

Table 4 reports descriptive statistics according to the type of banks. This Table explains all the variables for this study. According to the type of bank, the research sample is divided into three types of banks, namely state-owned banks, foreign exchange banks, and non-foreign exchange banks. The highest total cost is BRI Bank (state-owned bank) which amount 81,017,303 in 2017. The lowest total cost is Sahabat Sampoerna bank which amounts 5,574,853 in 2009. State-owned banks have the most substantial total assets period 2009-2017, which is around 464,217,319. State-owned banks are known as banks with the most considerable total assets because of government ownership. However, it does not mean that state-owned banks are the most efficient among other banks. Interestingly, a total asset as high as total cost in state-owned banks.

From Table 5., almost all banks are classified inefficient enough except two banks, i.e. OCBC NISP (less efficient) and UOB (efficient). Cost efficiency of UOB is 96.061 percent meaning on average UOB achieves 96.061 percent cost efficiency. The highest is UOB while the lowest is OCBC NISP. The average cost efficiency is 88.11 percent which means that the banks are wasting 11.89 percent of their inputs mix. So, there are 11 banks under average cost efficiency. In state-owned banks, there are Mandiri Bank and BRI Bank. In foreign exchange banks, there are BTPN, Mayapada, Mega, OCBC NISP, and Permata. The last in non-foreign exchange banks, there are Harda International, Jasa Jakarta, Sahabat Sampoerna, and Bukopin. Instead, all banks which are under the average cost efficiency should reduce their total cost. It is because in increasing cost efficiency.

Although efficiency level differs between the type of banks, it is needed efficiency rankings of all banks. The identification of which conventional banks are more efficient than others is usually more important for regulatory policy decisions (Fiorentino *et al*, 2011). To determine efficiency rankings, based on average from 3 types of banks, foreign exchange banks are most efficient among the others. Mean efficiency in foreign exchange banks is 88.641 percent, which is higher than the level of average all banks (88.111 percent). Mean efficiency in state-owned banks is 87.42 percent and mean efficiency in non-foreign exchange banks is 87.422 percent. Based on Table 6, foreign exchange banks are most efficient among the other banks then followed by non-foreign exchange banks and the last is state-owned banks.

Nevertheless, efficiency rankings are different from descriptive statistics. In the level of cost efficiency, foreign exchange banks are the most cost-efficient banks with the value of CE is 88.641 percent. However, according to descriptive statistics, state-owned banks is the highest of all variables includes total cost, and variable inputs or outputs. It means that banks with the more substantial total asset, total cost, and the high price of labor and interest have lower efficiency than banks with smaller one.

Table 6. Efficiency Rankings of Type Banks

Type banks	Level of cost efficiency		Descriptive Statistics	
	Cost efficiency	Ranking	Price of labor Price of borrowed funds Loans Securities (look at Table 5)	Ranking
State-owned banks	0.87420	3	(look at Table 5)	1
Foreign exchange banks	0.88641	1	(look at Table 5)	2
Non foreign exchange banks	0.87422	2	(look at Table 5)	3

Source: Processed Data, 2020

Based on Table 6, the most cost-efficient bank is foreign exchange banks. UOB is the efficient bank among others bank. However, in foreign exchange banks, there is OCBC NISP which is the lowest efficient bank. It means that stakeholders in foreign exchange banks should have controlled the financial performance of banking to keep the cost efficiency well. Besides, state-owned banks efficiency is 87.420 percent. BNI is the highest efficient in state-owned banks while BRI is the lowest one. BRI is one of the banks with large total asset and total cost, but in state-owned banks, BRI is unable to keep the financial performance running in cost efficiency well. In non-foreign exchange banks, Ina Perdana is the highest efficient amount to 90.618 percent while Jasa Jakarta is the lowest one amount to 84.213 percent.

Table 8 reports the regression outputs. Based on Table, the adjusted R squared is 98.66 percent and significant at 5 percent. It means the model can explain 98.66 percent variability in the model. Here, Constanta is 0.455666 means that if all variables were 0 (zero), LnTC would amount to 0.455666. For the variable price of labor (LnP1), I find that the coefficient is 0.377493 means that any percentage increase in the price of labor, the total cost will increase 0.377493, so banks tend to be less efficient. The price of labor is significant at 5%, meaning that the price of labor is a matter for bank efficiency (Anwar, 2019).

Table 7. Banking Efficiency

Variable	Coefficient	Standard Error	Probability	Note
C	0.455666	0.180062	0.0121	
LnP1	0.377493	0.037743	0.0000	+
LnP2	0.663833	0.036491	0.0000	+
LnQ1	-0.010109	0.046924	0.8296	-
LnQ2	0.007765	0.013319	0.1769	+
Adj R2	0.986598			

Source: Processed Data (significant at alpha 5 %), 2020

For the price of borrowed funds (LnP2), the coefficient is 0.663833 means that any percentage increase in the interest expenses, the total cost will increase 0.663833, so banks tend to be less efficient. The price of borrowed funds is significant at 5 percent, meaning that the interest expenses is a matter for bank efficiency. This result supports Linghe (2012) that input variable such as the price of labor and borrowed funds is favourable to the total cost. So, it means that banking should reduce the input variable to be efficient (Nkem & Akujinma, 2017).

For total loans (LnQ1), the coefficient is -0.010109 means that any percentage increase in the total loans, the total cost will decrease 0.010109, so banks tend to be more efficient. However, the total loans are not significant at 5 percent, meaning that the total loans are not mattered for banking efficiency. Instead, banking should give attention to total loans because it will give profitability for banking (Ha, 2020).

For securities (LnQ2), the coefficient is 0.007765 means that any percentage increase in the sum of securities, the total cost will increase 0.010109, so banks tend to be less efficient. However, the securities are not significant at 5 percent, meaning that the securities are not mattered for banking efficiency. This shows that the securities owned by bank produce returns that are lower than the costs (Ngumi, 2013). So that must be incurred by the bank in the securities. However, this variable does not significantly affect the total cost.

Overall, the variables that affect cost efficiency in conventional banks are the price of labor and price of borrowed funds. The variable with the most significant influence is interest expenses because of the effect when this variable increases by 1 percent, the total cost will increase by 0.663833 percent. Conventional banking must pay attention to the input variables such as labor cost and interest cost in order to increase cost efficiency so that banking performance will be achieved (Maesaroh, 2013).

CONCLUSION

Based on the results of the analysis and discussion above, it can be concluded that the average level of cost efficiency in foreign exchange banks is better than the average efficiency of state-owned banks and non-foreign exchange banks. Banks with the highest level of cost efficiency are UOB and OCBS NISP is the lowest one.

Based on the analysis of the effect of input and output variables on cost efficiency in banks, the variables that affect cost efficiency in banks are labor costs and interest expenses. It means that banks should give attention to the price of labor and funds. Stakeholders should know that higher expenses lower efficiency. Especially for state-owned banks which had a higher expense both in labor price and interest price.

RECOMMENDATION

The suggestion for further research is that the results of this study have not been able to prove the effect of cost efficiency on macroeconomic indicators as external variables in the banking sector. Re-research needs to be done which includes macroeconomic indicator variables such as inflation, interest rate, exchange rate and economy growth, as well as extended research periods so that better research will be produced.

Banking practition should be aware with cost in banking operational. Labor cost does not give positive contribution for bank. Higher labor cost, will make higher expenses in bank. Finally, it will make inefficiency in banking. Banking practition should have any

strategies to improve the quality and performance in finance of banking. Such as, increase the revenue and reduce the cost.

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