Comparison of Efficiency and Modelling of Islamic Banks and Conventional Banks in Indonesia

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Abstract : This study aims to analyze the efficiency comparison between Islamic banks and conventional banks in Indonesia in 2012-2014. The data in this study were chosen through purposive sampling from 20 Islamic banks and conventional banks in Indonesia. The method used in this study is non-parametric approach with data envelopment analysis (DEA) whereas input and output variables are treated in intermediary function. The input variables are total asset, total saving (third party fund), and price of labor while the output variables are total financing (loans) and total operational expenses. To measure the efficiency level of Islamic banks and conventional banks the independent sample t test is used. The result of the study shows that there is no significant difference of efficiency between Islamic banking and conventional banking in 2014 because of the significant value (2-tailed) only at 0.537 where P-value is higher than $\alpha=0.05$ H_a is refused. There is no difference of efficiency between Islamic banks and conventional banks in efficiency scale (ES). The empirical factors that affect Islamic banks and Conventional banks efficiency are ROA, CAR, and FDR variables. On the other hand, NPF results insignificantly and affects negatively towards Islamic banks efficiency. Lastly, ROA, NPL, LDR, and CAR had significantly affected Conventional banks efficiency in Indonesia from 2012 to 2014.

Keywords:. Efficiency, DEA, Islamic Banks and Conventional Banks, Intermediary Approach.
JEL clasification: G1,G2,G3

Introduction

The economic crisis that hit Indonesia in 1997, so that the private banks were exposed to liquidation, which is caused by factors such as bad credit. In 1997, there were 7 state banks and state banks shrank to 5 from 1997 to 2001, the amount of funds held in 1997 amounting to Rp 153 266 billion decreased to Rp 117 104 billion in 2001. While the private banks from 27 the number of banks in 1991 to 26 bank until 2001, also foreign banks amounted to 144 when it dropped to 80 foreign banks in Indonesia (Huri & Susilowati, 2004:96).

Government support for the existence of Islamic banking in Indonesia. This is evidenced by the reversal of Law No. 7 of 1992 into Law 1998 on Indonesian banks. In addition, the government has also issued the latest regulations governing the particulars of Islamic banking through Act No. 21 of 2008 (Pratikto & Sugianto, 2011:109).

Since the issuance of Law No. 10 of 1998 which allows a conventional bank operates by applying Islamic principles or conduct operations in Islamic and conventional *(dual banking system)*. The growth of Islamic banks experienced a significant acceleration, because the Islamic unit can offer Islamic banking products separate (Huda & Nasution, 2014:2).

However, one important aspect of this development is the competition between Islamic banks and conventional banks. Not only that fellow Islamic banks are also experiencing stiff competition. The efficiency of a barrier for both banks Islamic banks and conventional banks in competing. If a bank to be efficient in its performance, then the bank will always be stable in running operations and long-term returns to customers. Given the financial institutions such as banks are the institutions that are very risky and sensitive to the economic development of a country, because banks perform the function of an intermediary.

The main function of banks is as intermediary institutions that collect funds from the process, households, governments, and businesses to then be distributed to the needy. In other words, the bank facilitates the parties have more funds (surplus units) and distribution to beneficiaries who lack funds (deficit units). This function appears due to the high cost of monitoring, the cost of liquidity and price risk (price risk) due to asymmetric information between the owner of the funds with the funds, thus requiring the intermediary that it is able to fund both sides (Siringoringo, 2012:65).

This function makes financial institutions such as banks with strong ties to the real sector and the effect of economic growth in a country. Also associated with the stabilization of the banking institutions, so the effect on the liquidity risk, credit risk and other financial risks. Banking failures will cause a systemic effect on the economy of the State. Therefore, the government needs to maintain and monitor the health of banks.

So that a bank must maintain its performance in order to operate optimally. Moreover, Islamic banks now have to compete with conventional banks with more rapid growth than before. One factor to consider is the bank's financial performance. This can be seen through the bank's financial statements by calculating the ratio. So that we can analyze the performance of banks in a healthy and optimal (Ningsih, 2012:21).

Efficiency is one of the banking performance parameters that are theoretically underlies the entire performance of the company. The ability to maximize the available inputs to produce a high output is a measure of expected performance. In banking, the conditions of how to get there with minimal input level of input. To see ketidakefesiensi a bank can assess the level of output and input to further analyze the factors (Sarjono, 2008:3).

Because there is a relationship between the financial sector to the economic stability of the State. The efficiency of the financial sector showed growth in the economy. Bank Indonesia in its policy targeting the three main corridors, namely: First, the maintenance of the stability of the financial system. Second, strengthening the resilience and competitiveness of the banking system. Third, strengthening the intermediation function. As for Islamic banking, the economic outlook and the policy is expected to further propel the growth of the industry forward, especially through the potential market is still huge untapped fully in line with the improvement in income per-capita, better coordination among stakeholders in the development of Islamic financial and strong domestic consumption sector and the success of public education programs and the promotion of Islamic Banking (Bank Indonesia, 2012).

Literature Review

Literature review on this study has been conducted by several researchers associated companies as well as the level of efficiency in the operations of banks. Firdaus & Hosen (2013), taking two-stage method of analysis, namely the first stage using the DEA, and the second stage uses Tobit models or perform regression for factors that affect efficiency. The results show there is no optimum efficiency in Bank Syariah during the period 2010-2012. Other studies conducted by Hadad, et al (2003), method, DEA, with the title of the Indonesian banking industry

efficiency analysis using non-parametric method of data envelopment analysis (DEA). The results showed merging banks experienced during the last three years the efficiency of the Year 2001-2003. Then the merger does not produce good efficiency for the bank. However, most banks that merged to experience efficiency.

Firdaus & Hosen (2013), using two-stage method of analysis, namely the first stage using the DEA, and the second stage uses Tobit models or perform regression for factors that affect efficiency. The results show there is no optimum efficiency in Islamic Banks during the period 2010-2012.

Another study using DEA method are Fauzi (2013), Joko Sarjono (2008), Shahid, et al (2010), Vitello & Sutarno (2010) used the DEA and comparison with the ROA, Yudhisthira (2004), using the method of DEA and OLS, Ahmad & Noor (2011), using the two-stage analysis: DEA and Tobit, Shafitranata (2011), Daman Huri & Susilowati (2004), Widyastuti (2011) using DEA and regression model panel (fixed effect model), and Perwitaningtyas (2014) using DEA and multiple Regression. While the research results Fauzi (2013), showed a significant difference between the efficiency of CB and IB both CRS and VRS.

Sarjono (2008) investigated the efficiency analysis of Islamic banks with DEA method, case studies Mumalat bank, Bank Syariah Mandiri and Bank Mega Syariah Year 2005-2007, the results showed the bank muamalat got scale the highest efficiency of all three banks. Haseeb Shahid researching "*efficiency comparison of Islamic and conventional banks of Pakistan*". The results showed conventional banks in Pakistan more efficient technically of the Islamic Bank. But cost allocation and cost efficiency showed a healthy competition. While the value of t-statistic showed no significant difference between the average efficiency score Islamic banks and conventional banks except in 2008.

Similarly, Ahmad and Noor (2011), conducted the research with two stage analysis method: DEA and Tobit. The results showed that there were technical efficiency in the profitability of Islamic banks and demonstrate efficiency tends to favor an Islamic bank. While research Wijayanto & Sutarno about the performance efficiency of intermediation owned banks in Indonesia by using DEA. Results showed BNI, BTN, and Mandiri have relative efficiency level of 100%. BNI obtain relative efficiency level of 88.5%. While the average score of efficiencies gained by the bank approximately 97.13%.

Recently research Widayastuti (2011), using the method of DEA and panel data model, showed that the average efficiency rate of 96.15% of Bank BNI, BRI amounted to 92.56%, the bank amounted to 98.50% and 96.51% of BTN. While the results of the regression using panel data shows that only asset variables that significantly influence the performance efficiency of state-owned banks in Indonesia. While third-party funds and loans did not significantly affect the efficiency of state-owned banks.

From some research above suggest that research into the level of efficiency of banking can be done with different methods and approaches vary. But in this study researchers used intermedisasi approach in determining the input and output of banking, while the methods used to see the level of bank efficiency using Data Envelopment Analysis (DEA). Then comparative efficiency of using the One Sample Test Furthermore, to analyze the effect of efficiency with that contained in Islamic banks and conventional banks researcher using Fixed Effect Model (FEM) 2012-2014.

The Concept of Efficiency

Efficiency is a term that is relative, that is always associated with a certain criterion. Most economists bisects an efficiency standpoint. First of positive aspects, which in the thrust of human behavior are always looking for increased value, this value will form the search market mechanism. Secondly, in terms of normative, stems from the desire to create a policy, whether the policy is better than other policies (Sari, 2010: 14).

Nuryana Sari (2010) states that the concept of efficiency starting from the concept of production theory that explains the relationship between input and output. The production function illustrates the input to output in a given period. One of the models used to describe the production function is the production frontier models. This line shows the relationship of input and output in the production process. The production line of the production frontier represent the maximum output level of any inputs that represent the use of technology from a company or industry.

The concept of efficiency was first proposed by Farrell as a follow-up proposed by Debreu and Koopmans. Efficiency measurement proposed by Farrell can take into account the input compound. Efficiency a company consists of two components, namely technical efficiency and allocative efficiency. Technical efficiency indicates the ability of companies to achieve maximum output from a number of inputs. While the allocative efficiency of input use show a company optimally at a certain price level input. Then the two components are combined to produce a measure of efficiency or total economic efficiency (Abidin & Endri, 2009: 22).

Basic economic theory there are two terms of efficiency, the technical efficiency and economic efficiency. Economic efficiency has a macro point of view that has more reach than technical efficiency micro-view cornered. Measurement of technical efficiency tends to be limited to technical and operational relationships in the process of converting inputs into outputs (Huda & Nasution, 2014: 10). As a result, efforts to improve the technical efficiency requires only micro policy which is internal, namely the control and optimal resource allocation. Price in economic efficiency can not be considered to be given, as they can be affected by macro policies (Amrillah, 2010: 22).

In general, banking efficiency can be divided into two kinds. The first scale efficiencies. Both X-efficiency. The concept of scale efficiencies introduced by Farrell (1957), which can be simply defined as the relationship between the average production cost per unit and volume, thus the bank is said to have economies of scale when output was accompanied by a low unit cost of production. Both X-Efficiency introduced by Leibenstein (1966), refers to the deviation from the constraints of cost savings from the lowest production costs for a given level of output. X-efficiency derived from technical efficiency and allocative efficiency (Yudhisthira, 2004: 2).

However, to achieve the level of economic efficiency of a company should be technically efficient. In order to achieve the level of profit (profit) is maximized, the company should produce the maximum output with given inputs (technical efficiency) and produces output with the right combination at a certain price level (allocative efficiency) (Sari, 2010: 16).

Research Method

The method employed in this study to measure the performance of technical efficiency using Data Envelopment Analysis (DEA). DEA measuring the ratio between the input and ouput owned by banks, the approach used is the intermediation approach in measuring input and output. Samples were examined in this study were 20 Islamic banks and 20 conventional banks in the period 2012-2014. Variables that used are the input variables comprised of Total Deposits, Labor Costs, and the total assets. While the output variables consist of Total Financing, and total operating income. Then to see the comparison between Islamic banks with conventional banks Years 2012-2014, the authors use the method Independent sample t test in SPSS Software 17. Furthermore, the results are grouped in the efficiency ratio of Islamic banks and conventional banks.

Furthermore, to look at the factors that affect the performance of the efficiency of using the independent variable in this study consisted of financial ratios in Islamic banks and conventional banks such as ROA, CAR, LDR/FDR, NPL / NPF. This variable is used to measure the factors that affect the performance of banking efficiency. While the scale of banking efficiency measured with DEA method is used as the dependent variable which is considered as the scale of the overall efficiency of the bank as measured by specific inputs and

outputs. In this study, using a fixed effect model (fixed effect model), because the data used is the data panel of cross section data and time series with a number of diverse individuals and only time was taken in the next 3 years.

Results and Discussion

A. Result

Results of measurement Data Envelopment Analysis (DEA) with the approach of CRS and VRS Islamic banks 2012-2014 indicates the following results:

Table 1.1 Assumptions CRS and VRS Performance
Efficiency Islamic Bank

No	DMU	CRS Mean	VRS Mean
1	BRI Syariah	81.62%	91.73%
2	BNI Syariah	90.64%	100%
3	BSM	77.69%	100%
4	Bank Muamalat	52.39%	95.88%
5	Bank Mega Syariah	100%	100%
6	MayBank Syariah	99.16%	99.34%
7	Bank Victoria Syariah	60.60%	63.27%
8	BCA Syariah	38.75%	43.40%
9	Bank Syariah Bukopin	92.16%	92.36%
10	Bank Panin Syariah	49.85%	50.85%
11	BJB Syariah	58.24%	67.97%
12	Bank Danamon Syariah	83.27%	86.89%
13	Bank Sinarmas Syariah	100%	100%
14	BTN Syariah	77.79%	100%
15	BII Syariah	100%	100%
16	Bank Permata Syariah	60.26%	100%
17	Bank DKI Syariah	77.61%	80.02%
18	Bank DIY Syariah	73.43%	100%
19	Bank Aceh Syariah	100%	100%
20	BTPN Syariah	100%	100%

Source: DEA excel

While the measurement results Data Envelopment Analysis (DEA) with CRS and VRS approach conventional banks 2012-2014 indicates the following results:

Table 1.2 Assumptions CRS and VRS Performance

Efficiency Conventional Banks

No	DMU	CRS Mean	VRS Mean
1	BRI	98.23%	100%
2	BNI	88.12%	93.46%
3	Bank Mandiri	100%	100%
4	Mutiara Bank	100%	100%
5	BTN	99.61%	100%
6	BII	91.55%	93.73%
7	Bank Central Asia	93.24%	97.36%
8	Bank Pundi	98.74%	100%
9	Bank Mega	56.77%	58.42%
10	Bank Victoria	99.81%	100%
11	BTPN	100%	100%
12	Bank Sinarmas	80.45%	81.63%
13	Bank Danamon	97.58%	100%
14	Bank Bukopin	92.99%	95.36%
15	Panin Bank	100%	100%
16	Bank Permata	88.20%	91.39%
17	Bank DIY	79.55%	100%
18	BJB	74.31%	74.41%
19	Bank Aceh	81.98%	83.10%
20	Bank DKI	69.70%	70.53%

Source: DEA excel

Results of the comparison of efficiency in Islamic banks and conventional banks 2012-204 period by using independent sample t test indicates an average yield of three scale efficiency (SE) Islamic Banking and Conventional Banks Year period 2012-2014 can be concluded Ha accepted, meaning that there is a difference between efficiency Islamic banks and conventional banks in Indonesia in 2012-2014.

The results of this study contrast with previous research findings. Only in the year 2014 according to research conducted by Setiawan (2012), with the result there is no significant difference between the efficiency of Islamic Banking and Conventional Banks 2008-2012 period, with a view t <t table with P-value = 0.125. Furthermore, the results of research Pratikto & Sugianto (2011), with the result there is no significant difference between the efficiency of Islamic banks after and after the crisis on the approach-CRS DEA and DEA-VRS. Research conducted by Fauzi (2013), shows the results there are no significant differences between US and BUK significance SE (0.796> a) so that H0 is accepted. Later research Shahid, et al (2010), said the results were no significant differences between the average scores of efficiency of conventional banks and Islamic banks. Recently research Noor (2013), shows the results no significant difference between the efficiency of Islamic banks and conventional banks in approach-CRS DEA and DEA-VRS approach.

Furthermore, to analyze the factors that affect the performance efficiency Fator shown in the results of the regression Fixed Effect Model (FEM) as measured using 8.0 eviews shown in Table 1.3 as follows:

Table 1.3 Regression Results Factors Affecting Performance Efficiency of Islamic Banking and Conventional Banks

Variable	t-Statistic	Prob. Bank Syariah	t-Statistic	Prob.Bank Konvensional
C	-2.641141	0.0123	1.857364	0.0717
LOG(ROA)	-5.980466	0.0000	4.272712	0.0001
LOG(NPF)/NPL	-1.920170	0.0630	-3.078824	0.0040
LOG(FDR)/LDR	3.019806	0.0047	-3.389656	0.0017
LOG(CAR)	-3.657145	0.0008	4.473596	0.0001

Source: processed from Eviews 8.0

B. Discussion

The results of measurement of the efficiency of Islamic banks in 2012 showed the CRS approach shows only five Islamic banks are relatively efficient perfect (BMS, BDS, BIIS BSS and BAS). While in the year 2013 the number of Islamic banks are relatively efficient perfect increased by 6 banks. Then approach to CRS in 2014 the number of Islamic banks were efficient as many as 10 Islamic banks. However, the average efficiency of CRS approach to Islamic banks just as much as 5 Islamic banks were efficient in Year 2012-2014. The average efficiency of the approach is more dominant CRS Islamic banks experienced by sharia business unit than commercial banks sharia.

Nevertheless, every year the number of Islamic banks increased efficiency very rapidly, from 5 banks were streamlined into 10 banks were efficient at CRS approach. Then the VRS approach to Islamic banks are eight Islamic banks were efficient in Year 2012. In this VRS approach other variables held constant and does not affect other variables. In the year 2013 increased by 11 Islamic banks are relatively efficient. Then the VRS approach to Islamic banks in 2014 to approach as many as 12 banks belonging perfectly efficient. While the average Islamic banks were efficient in VRS approach is as much as 10 Islamic banks are relatively efficient.

Judging from the overall efficiency of Islamic banks in the year 2012-2014, it gained an average efficiency of Islamic banks in the approach scale efficiency (SE) as many as nine Islamic banks are relatively efficient perfect. Average experience this is the perfect efficiency of Islamic banks, while Islamic business units are also still relatively good efficiency even under Islamic banks. This is because the Islamic banks more easily compete with other banks, compared Islamic business units are still located on the premises of conventional banks.

Then the development of the efficiency of conventional banks are quite varied in 2012-2014. Judging from the CRS approach in 2012 the number of conventional banks are efficient as conventional bank 7, higher than Islamic banks. Later in the year 2013 the number of efficiency of conventional banks decreased to 3 conventional banks. While in 2014 the number of efficiency of conventional banks with an efficient approach to CRS experience as much as five banks. When viewed from an average of just 4 CRS efficient conventional banks. Sedankan the VRS approach to conventional bank in 2012 as many as 10 banks. In the year 2013 as many as nine conventional banks efficiently. In 2014 the number of conventional banks efficiently increased by 10 banks. Then the average of conventional banks in the VRS approach only as many as 10 conventional banks are perfectly efficient. Judging from the overall efficiency of the Year 2012-2014 on SE approach conventional banks an efficient amount is as much as seven conventional banks efficiently. This number is still below the average efficiency of Islamic

banks. This is because conventional banks are still not optimal in managing third party funds and credit and too much cost of funds for the banking operations.

The estimation results ROA significant negative effect on the efficiency of Islamic banks. These results are consistent with research Rahman and Rosman (2013), Endri (2011), Ismail, Majid, and Rahim (2013), Ulfa (2014), Firdaus & Hosen (2013), and Hasan (2005). Hasan (2005) mentions ROA has a strong correlation between the efficiency of the bank with the profitability of Islamic banks. While Ismail, Majid and Rahim (2013) reported similar results ROA positive effect on the efficiency of Islamic banks are scale efficiency (SE). So with the above results it can be said even though the variables return on asset negative effect, the higher the ROA ratio of Islamic banks more efficient.

And then the regression results for conventional bank ROA positive and significant impact on the efficiency of conventional banks in 2012-2014. The analysis results ROA at conventional banks according to the research Soetanto & Ricky (2011), which showed ROA significant effect on the efficiency of conventional banks in Indonesia, due to the amount of assets owned by a conventional bank is greater than the Islamic banks.

The estimation results NPF negative but insignificant effect on the efficiency of Islamic banks in the year 2012-2014. This means that NPF did not affect the efficiency of Islamic banks in Indonesia. This is in contrast to the initial hypothesis that NPF requires significant negative effect on the efficiency of Islamic banks. And then results for conventional banks to non-peforming loans (NPLs) So accept the hypothesis that the NPL a significant negative effect on the efficiency of conventional banks. Means the ratio of NPL affect the efficiency of conventional banks in the year 2012-2014. This is due to the NPL ratio in conventional banks are relatively smaller and the burden of risk borne by conventional banks lower for larger banks will issue a guarantee fee, supervision to financing problems.

While the ratio of Islamic banks FDR showed Financing Deposit Ratio (FDR) positive and significant impact on the efficiency of Islamic banks. Pembiaayaan channeled Islamic banks is high and rising in the year 2012-2014, resulting in more optimal FDR variable and affect the efficiency of Islamic banks are positive and significant. And then results of the analysis Loan Deposit Ratio (LDR) a significant negative effect on the efficiency of conventional banks in Indonesia. Due to the negative and significant potential improvement can be seen from the average DEA conventional banks are still not optimal in providing financing to third parties. But the results of LDR analysis found a significant effect on the efficiency of conventional banks in Indonesia 2012-2014.

The empirical results of this study indicate CAR variables significantly influence the efficiency of Islamic banks in 2012-2014. Receiving initial hypothesis, the higher the ratio of a bank's CAR at the more efficient the bank anyway. Due to banks that have large capital to be able to maintain the stability of performance as a whole. The results are consistent with research Ulfa (2014), Endri (2011). The results of the analysis of the variable CAR to conventional bank in Indonesia in 2012-2014. Variable CAR positive and significant impact on the efficiency of conventional banks in Indonesia. These findings are consistent with results of previous studies conducted by Perwaningtyas (2014). However, most studies assume CAR variable has no effect or not related to the banking efficiency. As Soetanto & Rizky (2011), Masita (2013), shows that the health of banks is not having an effect on the efficiency that shows the Capital Adequacy Ratio (CAR), which is owned by the bank is only used by the bank to meet the policy rule of minimum capital so it does not affect the efficiency of the bank.

Conclusions and Recommendations

A. Conclusions

Conclusions that can be drawn from this study by using DEA and comparison of the efficiency and performance of Islamic banks and conventional banks and quantify factors that affect the performance efficiency as follows:

1. approach to scale efficiency (SE), it can be concluded that there are nine Islamic banks are relatively efficient on average in 2012-2014, while there are seven conventional banks are relatively efficient in 2012-2014. When compared to 20 Islamic banks and conventional banks, the efficiency is relatively numerous in Islamic banks as many as nine bank.
2. Results of the independent samples t test was obtained, there is a difference (Ha acceptable) level of efficiency between Islamic banks and conventional banks assuming SE 2012-2014, with a P-value of 0.007 <of α = 12:05 in 2012. In the year 2013 obtained p-value of 0.022 <of α = 12:05 in 2013. While in 2014 obtained p-value of 0166> α = 0:05 in 2014, there are no means to accept H0 efficiency differences between islamic banks and conventional banks. However, the average ratio is concluded there are differences in the efficiency of Islamic banks and conventional banks in 2012-2014.
3. Efficiency Islamic bank from 2012 to 2014 with ROA, NPF, FDR, and CAR. It can be concluded ROA significant influence amounted to 0.0000, FDR variables have significant influence amounted to 0.0047, the variable CAR significant influence amounted to 0.0008 at the level of 5% or 0:05. While no significant effect NPF variable with a value of 0.0630 to the efficiency of Islamic banks in 2012-2014.
4. The efficiency of conventional banks from 2012 to 2014 with ROA, NPL, LDR, and CAR. It can be concluded ROA significant influence amounted to 0.0001, variable NPL significant influence amounted to 0.0040, variable LDR significant influence amounted to 0.0017, and variable CAR positive and significant impact on the efficiency of 0.0001 conventional bank in Indonesia in 2012-2014.

B. Recommendations

After conducting an analysis of this study, Source: DEA excel the authors have some advice to be reviewed in this study, as follows:

1. The sample in this study is limited to 20 Islamic banks and 20 conventional banks. While the variables used only 5 types, input variables include total assets, total deposits, and labor costs. While the output variables include the total financing and total operating income. So for researchers to develop the variables used in this study, as well as other approaches besides the intermediation approach undertaken.
2. Comparison of the efficiency of Islamic banks and conventional banks in this study used a different test. For further research can be carried out studies into the factors that affect the macro or micro level of efficiency in the banking system.
3. Should the approach model Data Envelopment Analysis (DEA) can be used in research IB, Islamic business units, and conventional banks, to obtain relevant information on the performance of the institution.
4. Later variable factors that affect the technical efficiency of banks can be deepened back in future studies
5. For academics and researchers can use a variety of variables in measuring technical efficiency in the institution or company.

6. Availability of data affecting the efficiency of banks can be trusted, so that it can obtain diverse information.
7. For the Indonesian Bank and the financial services authorities should discuss and formulate a policy that is carried out in measuring financial performance.
8. This study was limited in using a regression model that related to internal factors banking, due to the availability of external data is still limited and the period used comparatively brief for 3 years.

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