The impacts of competition, efficiency, and risk towards bank's performance in Indonesia

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Abstract

Banks in Indonesia provide more than 40 percent of funding in economy. Sustainable performance of commercial banks is important because they have large effects on the growth of whole economy. The purpose of this study is to investigate how the effects of competition, efficiency, and risk on performance of bank in Indonesia forty-six public commercial banks in Indonesia Stock Exchange (IDX) between 2002-2018. One-step system generalized method of moments are used to handle endogeneity in dynamic panel model. Competition of non-interest income market influence negatively on bank performance. Cost efficiency and revenue efficiency does not affect bank performance. Profit efficiency positively effect on net interest margin, but not return on assets. Credit risk negatively effects on ROA, not on NIM. Capital risk negatively effects on NIM, but not ROA. Insolvency risk negatively effects on NIM, not on ROA. While, loans and deposit market's competition and liquidity risk does not affect bank performance in Indonesia.

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Abstrak

Perbankan di Indonesia menyediakan lebih dari 40 persen pendanaan dalam perekonomian. Kinerja bank umum yang berkelanjutan penting karena itu berpengaruh besar terhadap pertumbuhan ekonomi secara keseluruhan. Penelitian ini bertujuan untuk mengetahui bagaimana pengaruh persaingan, efisiensi, dan berbagai risiko terhadap kinerja bank di Indonesia bagi 46 bank umum yang publik di Bursa Efek Indonesia (BEI) selama tahun 2002-2018. One-step generalized method of moments *dipakai untuk menangani endogenitas dalam model panel dinamis. Persaingan pasar pendapatan non-bunga berpengaruh negatif terhadap kinerja bank. Efisiensi biaya dan efisiensi pendapatan tidak mempengaruhi kinerja bank. Efisiensi laba berpengaruh positif terhadap* net interest margin (NIM), *tetapi tidak berpengaruh positif terhadap* return on assets (ROA). *Risiko kredit berpengaruh negatif terhadap* return on assets (ROA), *bukan* NIM. *Risiko modal berpengaruh negatif terhadap NIM, tetapi tidak berpengaruh pada* ROA. *Risiko insolvensi berpengaruh negatif terhadap NIM, tetapi tidak terhadap* ROA. *Sedangkan risiko persaingan dan likuiditas pasar pinjaman dan simpanan tidak mempengaruhi kinerja bank di Indonesia.*

Kata Kunci:
Kinerja bank; Persaingan;
Efisiensi; Risiko

1. Introduction

The banking industry significantly effects on the advance of the economy. Indonesia's banking sector is vital components of financial systems that provide more than 43 percent of funding in 2016.

Considering the critical function of the banking sector in Indonesia, it is crucial to have healthy, efficient and sustainable banking sector. Even though banking sector in Indonesia already adopt market-based system, it still show dominance of short term than long-term debts and relatively high net interest margin (Nasution, 2015). Lusida & Suk (2019) show relatively high financial market frictions in Indonesia negative effects on the asset allocations of the non-financial firms.

However, as seen in Figure 1 during the period 1998-2017, performance based on *ROA* and net *NIM* of banks in Indonesia had a fairly stable trend, although in 1999-2000, *ROA* and *NIM* of banks in Indonesia experienced a downward trend. *ROA* and *NIM* increased again in 2001. Then, in 2002-2017, *ROA* and *NIM* of banking in Indonesia tended to be stable. This shows that the performance of commercial banks in Indonesia is relatively stable even though it was affected during the economic crisis in 1998.

Competition of the banking industry frequently mentioned as a main factor of the performance of the banking industry. According to structure conduct performance (SCP) theory market power or market concentration is the main driving force to gain higher performance of a bank (Goldberg & Anoop, 1996). Thus, banks with more concentrated market tend to less collide to obtain the higher profits. Quite a many researchers showed that the competition of the banking industry to explain bank performance (García-Herrero et al., 2009; Chortareas et al., 2012; Tan, 2016; Fang et al., 2019). In contrast, efficient structure hypothesis state that efficiency of the firm brings the superior performance of the bank (Hannan, 1991). Efficient structure hypothesis also predicts that in concentrated market structure, the more dominant banks get the higher profitability with the increase of the efficiency.

In addition, the synchronization of the world economy through globalization and diversification of the business in banking sector tends to increase the concern to various types of risks that influence the bank performance. For instance, Ali et al. (2011) investigate the credit risk to bank profitability, and Drakos (2003) show the effect of the liquidity risk
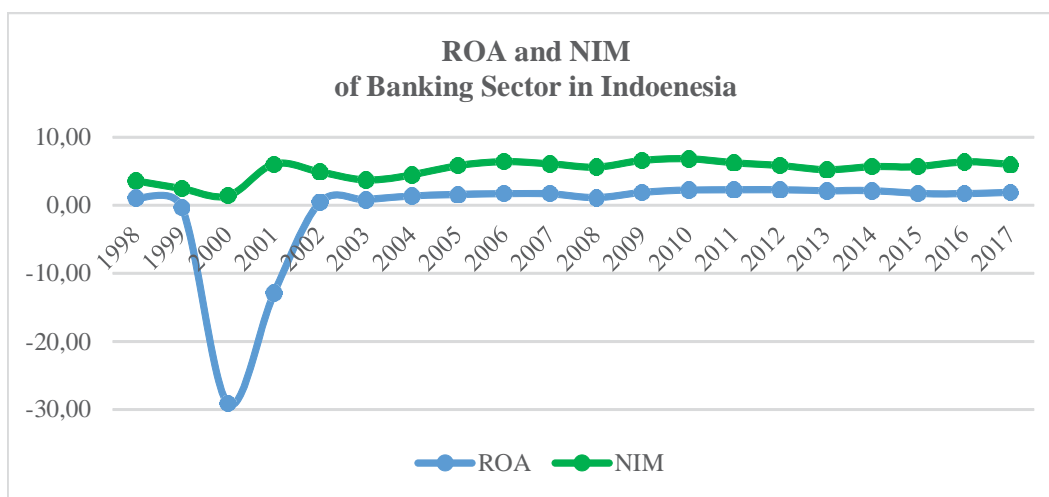

Figure 1. *ROA* and *NIM* of banking sector in Indonesia

on bank performance. Additionally, Garza-García (2012) show the importance of capital risk in bank performance. Shair et al. (2019) show also the insolvency risk of banks to its performance.

This paper we investigate simultaneous effects of market competition, banking efficiency, and various risk types of banking to the performance of the banks in Indonesia.

2. Hypotheses Development

Effect of competition on bank performance

Market structure influences on the level of the competition of the industry and competitions have effects on the performance of individual firms in that industry. In a concentrated markets banks behave monopolistically by lowering deposit rates and receiving costly loan rates (Goldberg & Anoop, 1996). Structure conduct performance (SCP) theory argue that firms that run their business with higher level of competition tends to have lower concentrated industry structure (Dinh & Calabro, 2019). Thus, firms in that industry tend to collide to obtain the higher profits (Chortareas et al., 2012; Tan, 2016; Fang et al., 2019). In contrast, efficient structure hypothesis state that efficiency of the firm brings the superior performance of the bank.

Chortareas et al. (2012) show that competition of the banks cause the low profits of the banks in Latin America. Munir et al. (2011) and Abiodun (2012) also find that competition negatively effects on bank profitability. Agustini & Viverita (2012) show that concentration of the bank has positive effects of the bank performance in Indonesia.

H_1:   banking competition negatively effects on bank performance

Effect of efficiency on bank performance

Efficient structure hypothesis state that efficient banks increase their market share and size because they enable to produce higher profits. Effi-

ciency that bank create through service processes or management generate superior profits, and it tends to intensify market concentration (Goldberg & Anoop, 1996).

Seelanatha (2010) and Guillén et al. (2014) show that the efficiency variable had a positive and significant to bank performance (*ROA*). García-Herrero et al. (2009) show also that banks in China with high levels of efficiency have high profitability.

H_2:   bank efficiency positively effects on bank performance

Effect of credit risk on bank performance

Credit risk is risk of failing of debtors to pay required payments to the bank. To reduce the main risk of bank, which is credit risk banks develop various models to increase the creditability of their potential debtors and reduce the credit risks.

Ali et al. (2011) investigated the effect of bank size, gearing ratio, credit risk, asset management, efficiency, capital risk on *ROA* and *ROE*. They prove that credit risk significantly and negatively effects on bank performance estimated *ROA* and *ROE*. Tan et al. (2017) and Fang et al., (2019) who investigate the simultaneous effects of diverse bank risks, competition and efficiency on bank performance find that credit risk negatively effects on performance of a bank.

H_3:   credit risk (measured using the parameter impaired loans / gross loans) negatively effects on bank performance

Effect of liquidity risk on bank performance

Liquidity risk the bank failure risk because it cannot settle its maturing obligations through cash flow from funding sources and / or from liquid assets that bank owns. Liquidity may reduce profitability of the bank because high liquid assets tends to incur lower interest income (Beck et al., 2006).

However, if bank with higher liquid assets can increase turnover the loans, then can have higher volume of the loans that results in better performance (Tan et al., 2017).

Beck et al. (2006) show that banks with high liquid assets generate lower interest income than banks with low liquid assets. Tan et al. (2017) find that liquidity risk positively effects on performance in Chines banks. Whereas Fang et al. (2019) and Shair et al. (2019) discover that liquidity risk does not have effects on the profitability of the banks.

H_4: liquidity risk (measured using the liquid assets / total assets parameter) negatively effects on bank performance

Effect of capital risk on bank performance

Capital of bank has been known to reduce risk of the bank because capital can reduce liquidity shocks and portfolio losses as a buffer (Hogan, 2015). Because of the importance of the capital of bank Basel committee for a long time try to modify for finding suitable capital adequacy ratio to ensure stability of the banks especially after crisis (Berger & Bouwman, 2013). The volume of the capital negatively rated with capital risk. However, bankers often say that to maintain large capital may endanger the profitability.

Garza-García (2012) and Francis (2013) show that capital had a positive on profitability. In additions, Berger & Bouwman (2013) show that capital improve the profitability of small bank both financial crisis and non-financial crisis period. They find also that the capital get better the profitability of the medium and large bank during the crisis.

H_5: capital risk positively effects on bank performance

Effect of insolvency risk on bank performance

Individual bank's insolvency risk or bankruptcy risk not only impact to individual bank's sur-

vival but also whole banking system of an economy. Insolvency risk may have negative effects on profitability because if bank becomes insolvent condition, the related indirect bankruptcy costs is so high. While, Tan et al. (2017) show that insolvency risk has positive effects on bank performance. Shair et al. (2019), however, show that insolvency risk negatively effects on bank profitability with another types of risks. While, Fang et al. (2019) show that insolvency risk have no effect on profitability of Chinese banks.

H_6: insolvency risk negatively effect on bank performance

3. Method, Data, and Analysis

The research objects are 46 public commercial banks in the Indonesia Stock Exchange (BEI). All these banks are observed for seventeen years starting from 2002-2018. We use unbalanced panel data and eliminate the firm-year data in case incomplete data for measure variables. We get the data from Capital IQ from S&P.

When bank performance is measured by *ROA* and *NIM*, it causes endogeneity issues. The more profitable a bank is, the easier to raise capital by retaining profits. Apart from capital risk, the credit risk variable also faces endogeneity issues. To solve the issue of endogeneity, the lagged 2 (two) years for both variables are used. Another issue related model is the unmonitored heterogeneity in the banking sector, which may exist in Indonesia due to differences in governance between banks. Thus, methods that used (Tan, 2016) which uses a one-step estimator system generalized method of moments (GMM) are applied to estimate performance in the banking sector in Indonesia. The empirical models to estimate banking performance as follows;

$$Perf_{it} = \alpha_0 + \alpha_1 Perf_{i,t-1} + \alpha_2 Comp_{i,t} + \alpha_3 Eff_{i,t} + \sum_{m=4}^{7} \alpha_m Risk_{i,t} +$$

$$\sum_{m=1}^{m} \beta_m T_{it}^m + \sum_{n=1}^{n} \gamma_n T_{it}^n + \sum_{p=1}^{p} \delta_p T_{it}^p + \sum_{n=1}^{n-1} \varphi_n Year_i + v_{it} + v_{it} \dots (1)$$

Where $Perf_{it}$ refers to the performance indicators for specific banks and specific years. $Comp_{it}$ is market competition. Eff_{it} is efficiency in cost, profit, and revenue. $Risk$ is credit, liquidity, capital, and insolvency risk. T_{it} are three groups of determinant factors of bank performance. T_{it}^m are bank specific determinants, including size of bank and diversification level of a bank, T_{it}^n are industry-specific determinants, including banking sector development and stock market development, and T_{it}^p are macroeconomic determinants, inflation. $Year_i$ is the time dummy between 2002-2018. v_{it} are bank-specific heterogeneity that is not observed and v_{it} is error term of the model.

Measurement of competition variables

The Boone (2008) indicator is used to measure bank competition. Compared to other competition measurement methods, The Boone indicator has a superiority in estimating competition for certain product markets and for different bank categories.

$$MS_{ki} = \psi_0 + \psi_1 MC_{ki} \quad \text{..(2)}$$

Where i is specific bank, k is specific bank output, MS represents natural logarithm of market share, MC represents logarithm marginal cost, ψ_1 is Boone indicator. k represents credit, non-interest income, and saving of individual bank. Related specific method of calculation to get Boone indicators, approach of Fang et al. (2019) is applied in this research.

Measurement of efficiency variables

To calculate efficiency, two methods usually are employed; Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA). Fries & Taci (2005) state that SFA is much more suitable than DEA in developing markets, because they tend to have more serious mismeasurement of variables and

higher economic uncertainty than that of developed markets. SFA is used to estimate efficiency in Indonesian banks.

Following to Tabak et al. (2012) efficiency is estimated using Equation (3) after all variable take natural logarithm. Then, we separate error term into two components as in Equation (4).

$$\left(\frac{C}{X_2}\right)_{it} = \rho_0 + \sum_j \rho_j Z_{jit} + \frac{1}{2}\sum_j \sum_k \rho_{jk} Z_{jit} Z_{kit} + \alpha_1 \left(\frac{X_1}{X_2}\right)_{it} +$$

$$\frac{1}{2}\alpha_2 \left(\frac{X_1}{X_2}\right)_{it}\left(\frac{X_1}{X_2}\right)_{it} + \sum_j \lambda_j Z_{jit} \left(\frac{X_1}{X_2}\right)_{it} + \varepsilon_{it} \quad \text{............(3)}$$

Where index i and t is bank i is running on time t, whereas j and k is a another output, C is the natural logarithm of total cost of a bank, Z refers outputs, which are natural logarithm of total deposits, securities, total credits, and non-interest income. On the other hand X represents two input costs, X_1 is the cost of funds, which is defined by the natural logarithm of ratio of interest expenses over total deposits, X_2 is cost of capital, that is estimated by the natural logarithm of the ratio of non-interest expenses over fixed assets.

$$\varepsilon_{it} = v_{it} + v_{it} \quad \text{..(4)}$$

Where index i and t is bank i is runing on time t, v_{it} is normal disturbance term that has variance of σ_v^2. v_{it} captures inefficiency of a bank. To estimate income efficiency and earnings efficiency, the same specifications is applied by substituting gross income and profit as the dependent variable.

Measurement of risk variables

Four kinds of risk in the banking sector are estimated which are credit, liquidity, capital, and insolvency risk. The three types of risks which are credit, liquidity, and capital risk are measured using accounting ratios. Credit risk is calculated by the ratio of non-performing loans of a bank over its total loans. Liquidity risk is calculated by the ratio

of liquid assets of a bank to its total assets. Then, capital adequacy ratio is employed to measure capital risk.

To measure insolvency risk, we follow Tabak et al. (2012) approach. To estimate insolvency, dependent variable in Equation (3) are substituted by natural logarithm of Z-score over X_2. After that technical and allocative inefficiency is measured by in Equation (4). The lower (higher) stability inefficiency indicates the lower (higher) insolvency risk.

4. Results

Bank competition in Indonesia

Table 1 presents the Boone indicator in Indonesia during 2002 -2018. The Boone indicator for loans market ranges from -1.0593 (min) to -0.7616 (max). The competition level in the loans market

tends to show a fairly stable and there is no high volatility on the loans market. The Boone indicator for the non-interest income market ranges from -1.0517 (min) to -1.0047 (max). The competition level in non-interest income markets tends to show a fairly stable trend and there is no high volatility in the non-interest income market. The Boone indicator for market deposits ranges from -1.0582 (min) to -0.7370 (max). The level of competition in deposits markets tends to show a fairly stable trend and there is no high volatility in the deposits market.

Estimation bank efficiency

We estimate three time-varying inefficiency, which are models proposed by Cornwell et al. (1990), Lee & Schmidt (1993), and Battese & Coelli (1992). These three models we mention as *CSS90*, *LS93*, and *BC92*. We estimate also two time-invari-

Table 1. Boone indicators in loan, non-interest income and deposits markets

Year	*Loan Market*		*Non-Interest Income Market*		*Deposits Market*	
	Boone indicator	**p>|z|**	**Boone indicator**	**p>|z|**	**Boone indicator**	**p>|z|**
2002	-0.8590	0.000***	-0.9056	0.000***	-0.8809	0.000***
2003	-0.9927	0.000***	-0.9915	0.000***	-0.9845	0.000***
2004	-0.8756	0.000***	-0.9546	0.000***	-0.8762	0.000***
2005	-0.9282	0.000***	-0.9248	0.000***	-0.9416	0.000***
2006	-0.8807	0.000***	-0.9186	0.000***	-0.8786	0.000***
2007	-1.0095	0.000***	-1.0049	0.000***	-1.0085	0.000***
2008	-0.7616	0.000***	-0.7962	0.000***	-0.7370	0.000***
2009	-1.0593	0.000***	-1.0517	0.000***	-1.0582	0.000***
2010	-0.9700	0.000***	-1.0047	0.000***	-0.9326	0.000***
2011	-0.9028	0.000***	-0.9239	0.000***	-0.8744	0.000***
2012	-0.8534	0.000***	-0.8858	0.000***	-0.8441	0.000***
2013	-0.8954	0.000***	-0.9177	0.000***	-0.8888	0.000***
2014	-0.9465	0.000***	-0.9684	0.000***	-0.9460	0.000***
2015	-0.9597	0.000***	-0.9850	0.000***	-0.9562	0.000***
2016	-0.9976	0.000***	-1.0268	0.000***	-0.9901	0.000***
2017	-0.9620	0.000***	-0.9789	0.000***	-0.9474	0.000***
2018	-0.8060	0.000***	-0.8598	0.000***	-0.7979	0.000***

***, ** and * indicate statistical significant level at 1%, 5%, and 10% respectively.

ant inefficiency, which are Schmidt & Sickles (1984) and Battese et al. (1988). These two models we mention as *SS84* and *BC88*. The time-invariant efficiency is estimated from the in Equation (4) by transformed into .

Estimation results of cost inefficiency

Table 2 shows that cost inefficiency is estimated by *LS93* model is the best Stochastic Frontier Analysis (SFA). This is because the *LS93* model shows a cost inefficiency distribution with less variability than the *CSS90* model. The *BC92* model was not chosen because the *BC92* model has a very high correlation with the time-invariant model which is high correlation with the *SS84* model and *BC88* model.

Estimation results of revenue inefficiency

The *LS93* model is the best Stochastic Frontier Analysis (SFA) model to estimate revenue inefficiency. This is because the *LS93* inefficiency shows the distribution of revenue inefficiency with less variability than the *CSS90* model. The *BC92* model was not chosen because the *BC92* model has a very high correlation with the time-invariant model which is *SS84* and *BC88*.

Estimation result of profit inefficiency

The *CSS90* model is the best Stochastic Frontier Analysis (SFA) model to estimate profit inefficiency. This is because the *CSS90* model has the most statistically significant variables (there are 5 vari-

Table 2. Cost inefficiency model correlation

Model	SS84	CSS90	LS93	BC92	BC88
SS84	1.0000				
CSS90	0.5839	1.0000			
LS93	0.1113	0.2494	1.0000		
BC92	0.9448	0.5297	-0.0144	1.0000	
BC88	0.9872	0.5712	0.1178	0.9577	1.0000

Table 3. Revenue inefficiency model correlation

Model	SS84	CSS90	LS93	BC92	BC88
SS84	1.0000				
CSS90	0.6296	1.0000			
LS93	0.6325	0.4662	1.0000		
BC92	0.9695	0.6232	0.6499	1.0000	
BC88	0.9752	0.6424	0.6708	0.9919	1.0000

Table 4. Correlation of the profit inefficiency model

Model	SS84	CSS90	LS93	BC92	BC88
SS84	1.0000				
CSS90	0.4643	1.0000			
LS93	0.1322	0.2869	1.0000		
BC92	0.0414	0.1841	0.4931	1.0000	
BC88	0.9688	0.4329	0.1511	0.0484	1.0000

ables) when compared to other time-varying inefficiency models. On the other hand, the *LS93* model has 4 statistically significant variables and the *BC92* model has 4 statistically significant variables.

Estimation results of insolvency risk in Indonesia

The *LS93* model is the best Stochastic Frontier Analysis (SFA) model to estimate stability inefficiency. This is because the *LS93* model shows a cost inefficiency distribution with less variability than the *CSS90* model. In addition, the *LS93* model has the most statistically significant variables when compared to other time-varying inefficiency models. The *CSS90* model has 3 statistically significant

variables and the *BC92* model has 6 statistically significant variables.

Descriptive statistics

Table 6 show the descriptive statistics of the all variables except Boone indicators that are used for dynamic panel regression after winsorization in 1 percent and 99 percent to reduce the effects of outliers. Performance based on return on assets of the banks show relatively homogenous and has low standard deviation. On the other hand, performance based on NII show significant different among banks. The range of the NII very wide from 0.0138 to 0.2361. Difference of cost efficiency is dominant among 3 different types of efficiency among the

Table 5. Stability inefficiency model correlation

Model	SS84	CSS90	LS93	BC92	BC88
SS84	1.0000				
CSS90	0.3838	1.0000			
LS93	-0.0072	0.4294	1.0000		
BC92	0.2951	0.0957	-0.2388	1.0000	
BC88	0.9680	0.3739	0.0150	0.2874	1.0000

Table 6. Descriptive statistics of the variables

Variable	Obs.	Mean	Std. Dev	Min	Max
ROA	426	0.0132	0.0088	-0.0032	0.0445
NIM	426	0.0591	0.0276	0.0137	0.2361
Cost Efficiency	426	0.5021	0.5980	0.0000	4.1524
Revenue Efficiency	426	0.5012	0.5794	0.0000	3.2635
Profit Efficiency	426	1.8528	1.5164	0.0000	7.3019
Credit Risk	426	0.0362	0.0669	0.0007	0.9360
Liquidity Risk	426	0.2766	0.1269	0.0261	0.7511
Capital Risk	426	0.1883	0.0643	0.0556	0.6643
Insolvency Risk	426	0.7169	0.5803	0.0000	3.4800
Size	426	7.3878	0.7955	5.6600	9.1129
Stock market development	426	0.4087	0.0921	0.1536	0.5127
Inflation	426	0.0608	0.0254	0.0319	0.1310

banks. It means even if banks in Indonesia generate same level of revenues, but different level of cost efficiency may make the different profit efficiency enlarged.

ROA is estimated by the ratio of net income of the individual bank over its total assets. NII is calculated by the ratio of net interest income of an individual bank over its earnings assets. Credit risk is calculated by impaired loans of an individual bank over its gross loans. Liquidity risk is calculated by liquid assets of the individual bank over its total assets. Capital risk is calculated by capital adequacy ratio. Size of a bank is calculated by natural logarithm of total assets of an individual bank. Stock market development is calculated by the ratio of

market capitalization of the Indonesia stock markets over the gross domestic products. Bank diversification is calculated by non-interest income of an individual bank over its gross income. Measure of the efficiency and insolvency can be founded in main text.

Effect of competition, efficiency, and risk on bank performance

The p-value on the Sargan test is 0.084 and 0.298 respectively, which means that there are no overidentifying restrictions. Then, the consistency of the estimates is checked using the Arellano-Bond test. The results state even if the model has signifi-

Table 7. Effect of competition, efficiency and risk on bank performance

Variable	ROA		NIM	
	Coefficient	p-value	Coefficient	p-value
Lagged dependent variable	0.3753	0.003***	-0.2461862	0.000***
Bank specific variables				
Credit risk	-0.0080	0.056*	0.0144	0.404
Liquidity risk	-0.0029	0.532	0.0127	0.183
Capital risk	0.0119	0.260	-0.0703	0.096*
Insolvency risk	-0.0003	0.431	-0.0028	0.088*
Size	0.0033	0.001***	-0.0001	0.875
Cost inefficiency	0.0004	0.559	0.0009	0.266
Revenue inefficiency	0.0004	0.484	-0.0002	0.761
Profit inefficiency	-0.0000	0.891	-0.0005	0.076*
Bank diversification	-0.0052	0.159	-0.0153	0.002***
Industry specific variables				
Boone indicators of loans	-20.1266	0.378	42.1047	0.304
Boone indicators of non-interest profits	2.5538	0.075*	3.4125	0.097*
Boone indicator of deposits	14.3416	0.451	-52.3566	0.120
Stock Market Development	0.0068	0.007***	-0.0082	0.007***
Macroeconomic variable				
Inflation	0.0053	0.006*	-0.0016	0.561
F-Test	825.89***		73.55***	-
P-value of Sargan test	0.084*		0.298	-
AR (1)	-2.90	0.004***	-3.77	0.0000***
AR (2)	-0.08	0.933	-0.68	0.499

cant first order serial correlation, but does not have significant second order serial correlation in the model estimation results are consistent.

The lagged dependent variable positively effects on *ROA* in 1 percent significant level but is negatively effects on *NIM* in 1 percent significant level. Competition on the loans market and deposits market has no significant effect on bank performance (*ROA* and *NIM*). Competition on loans and deposits market which does not affect bank performance, because lending and funding customers usually not are affected by choosing another bank with better pricing (DeYoung & Roland, 2001).

Market share based on non-interest income has a significant positive effect on *ROA* and *NIM*. It means that competition has a significant negative effect on *ROA* and NIM. It is consistent with the results from Chortareas et al. (2012) and Agustini & Viverita (2012). Competition has a negative effect on the non-interest income market means banks may lose non-interest customers because non-interest customers are not bound in long-term relationships such as to lending customers. In addition, a substantial investment is required if banks are to switch from interest income-based to non-interest income business. The investment needed is investment from the aspects of technology and human resources.

Cost efficiency and revenue efficiency have no significant effect on bank performance (*ROA* and *NIM*). This results are contradictive with the results from García-Herrero et al. (2009), Seelanatha (2010), and Guillén et al. (2014). They show that the efficiency variable had a positive and significant to bank performance (*ROA*). Efficiency does not effects on the performance partially because if a bank only has efficiency in the expense aspect but it is not balanced with efficiency in the revenue aspect. Thus, it results in cost efficiency having no impact on bank performance (*ROA* and *NIM*). A bank has efficiency only in the revenue aspect, but if it is not balanced with efficiency in the expense aspect. Revenue efficiency without expense efficiency do not have an impact on bank performance (*ROA* and *NIM*) too.

Profit efficiency insignificantly effects on *ROA*. However, profit inefficiency has a negative and significant effect on *NIM*. Regarding profit efficiency which has positively effects on *NIM*, it can be explained with the following arguments: by having efficiency both in terms of revenue and expenses, the bank will get higher interest income and lower interest expenses. Because the formula for calculating *NIM* is interest income minus interest expenses then divided by earning assets. So that this will have an impact on a higher *NIM*.

Credit risk negatively effects on *ROA* in 10 percent significant level, but credit risk insignificant effects on *NIM*. This result is inconsistent with the findings of Tan et al. (2017) and Fang et al., (2019). They show that credit risk has negative effects on performance. Liquidity risk has no effects on performance. It is inconsistent with Tan et al. (2017) who find that liquidity risk has positive effect on performance in Chines banks. However, it is consistent with Fang et al. (2019) and Shair et al. (2019) who find that liquidity risk does not have effects on the profitability of the banks. Perhaps in Indonesia liquidity risk does not determine the distribution of lending and the quality of credit provided by the bank, but is only used to measure whether the bank is able to fulfil obligations and pay depositors (Riyanto & Surjandari, 2018).

Capital risk has no effect on *ROA* but have negative influence on *NIM* in 10 percent significant level. It is just partially consistent with Garza-García (2012) and Francis (2013) who show that capital had a positive on profitability. Insolvency risk has no effect on *ROA*, but negative influence on *NIM* in 10 percent significant level. This result also inconsistent with Shair et al. (2019) who prove that insolvency risk negatively effects on profitability with another types of risks. It is also partially consistent with Fang et al. (2019) who show that insolvency risk has no effect on bank profitability. It can be said risk factors in Indonesia do not effects on the bank performance.

5. Conclusion

We investigate effects of the market competition, bank risk factors, and macroscopic factor to the bank performance. Competition of loans market and deposits market has no effect on banking performance (*ROA* and *NIM*). However, competition of non-interest income market has a negative effect on banking performance (*ROA* and *NIM*). Efficiency of costs and revenues has no effect on banking performance (*ROA* and *NIM*). However, profit efficiency has no effect on *ROA* but has a positive and significant effect on *NIM*. Credit risk negatively effect on *ROA* but does not have effect on *NIM*. Liquidity risk has no effect on banking performance (*ROA* and *NIM*). This means that if the ratio of liquid assets over total assets of a bank is low, but if the bank can balance it with proper efficiency management, then profits can still grow. Capital risk has no effects on *ROA* but negatively effects on *NIM*. This means that if the CAR ratio of a bank is high, it can have an impact on reducing the *NIM* of a bank. Insolvency risk has no effects on *ROA* but negatively effects on *NIM*. This means that if the insolvency risk of a bank is high, it can have an impact on reducing the *NIM* of a bank.

For future research, it is expected to add other independent variables, such as market risk, interest rate risk, operational risk, legal risk, compliance risk, strategic risk, and pratices of good corporate governance so that the analysis of the influence of internal factors on banking performance will be more comprehensive. In addition, this research only covers public commercial banks in the Indonesia Stock Exchange (IDX). Further research can include all unlisted commercial banks in Indonesia or include Rural Banks (BPRs) as research objects.

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