

Market Concentration, Market Share, and Profitability (Study at Indonesian Commercial Banking in the Period of 2001-2012)

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Abstract

The objective of this research is to examine the influence of market structure on Indonesian commercial banking performance by using concentration ratio and individual market share through deposits market channel and credits market channel. There were 101 banks chosen from 120 banks in a period of 2001-2012 as sampling of research by using purposive sampling. This research uses data panel that combines data cross section and data time series, therefore panel data regression is used in this research. The result of panel data analysis has allowed us to conclude that concentration ratio of deposits market has a significant and positive influence on ROA, meanwhile concentration ratio of credits market, individual market share of deposits, and individual market share of credits market have no significant effects on ROA.

Keywords: market structure, concentration ratio, market share, ROA, banking industry, performance

1. Introduction

In general, the condition of Indonesian banking during 2001-2012 showed a good achievement. The market dynamic is marked by the reduction of the number of banks which operated in Indonesia, from 145 banks (in 2001) to 120 banks (in 2012). However, the number of bank offices is increasing from 6.765 bank offices (in 2001) to 16.625 bank offices (in 2012).

The total assets, deposits, and credits of Indonesian banking shows the significant improvement. Even though Indonesian banking still can't distribute credits optimally (credits is still lower than deposits), but LDR tended to rise from 40% (2001) to 84% (2012). The increment of LDR means the banking achievement in mobilizing society's funds is increasing. This achievement in performing intermediation function in this economics system occurs because of the good assets liability management. This fact can be seen from the development of LAR (loan to assets ratio) is performing faster than DAR (deposits to assets ratio). The operational efficiency has also increased, it can be seen from the decreasing of CIR and the increasing of ROA.

This phenomenon shows the relationship between market structure, conduct, and performance. The relationship between market structure and performance has been widely studied by several researches, the most used variables are concentration ratio and individual market share as the proxy of market structure variables. In Germany, Yu and Neus (2005) used CR (concentration ratio) as the proxy of market structure to determine its influence on profitability. The research found that market concentration has a significant negative relationship with profitability. However, in 2007, Wong, Fong, and Wong found the different result in their research which stated concentration ratio is positively insignificant with profitability. Meanwhile, Jian and Jing (2008) found a significant positive effect of individual market share on profitability in their joint-stock Chinese commercial banking.

This gap of research occurs because of the differences of sampling and dependent or independent variables in their researchs. Therefore, this study hopefully will deliver a better result to find out the effect of market structure on performance in Indonesian banking industry.

2. Research Model and Hypothesis

In accordance to research objective, the inferential analysis using two channels, which are deposits market channel and credits market channel. The influence of concentration ratio and market share from those channels will be seen explicitly, this thing will be the novelty of the research because the previous researchs only used one channel. The banking characteristics is included as control variable because every individual bank has its own characteristic uniqueness.

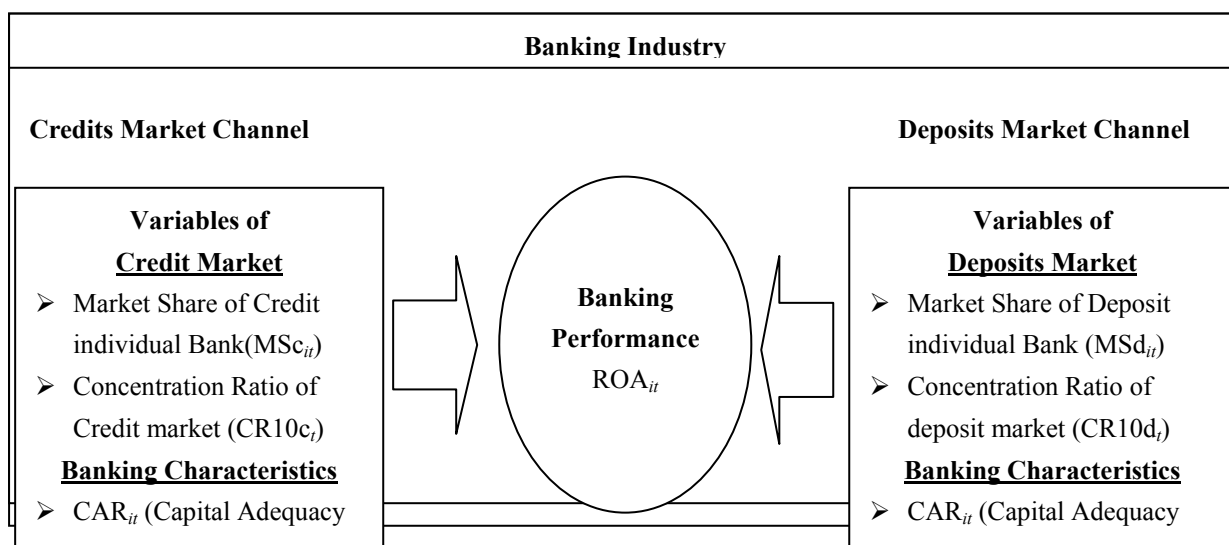


Figure 1. Research Model

2.1 Econometrics Model Equation of Deposits Market Channel

$$ROA_{it} = \alpha_0 + \alpha_1 CR10d_{it} + \alpha_2 MSd_{it} + \alpha_3 LDR_{it} + \alpha_4 CAR_{it} + \alpha_5 NPLg_{it} + e_{it}$$

2.2 Econometrics Model Equation of Credits Market Channel

$$ROA_{it} = \beta_0 + \beta_1 CR10c_{it} + \beta_2 MSC_{it} + \beta_3 LDR_{it} + \beta_4 CAR_{it} + \beta_5 NPLg_{it} + e_{it}$$

2.3 Hypothesis

Theoretically, the relationship between profitability with market share and market concentration has described in Structure-Conduct-Performance theory from Harvard Business School version, it is stated that structure, conduct, and performance are lineary related. In this study, performance is proxied by ROA, conduct is represented by market share, and structure is represented by market concentration. In banking industri, there are two market channels; deposits market channels and credit market channels. The two markets has a big role in banking profitability because a high deposits will makethe ability to distribute credits higher, therefore the net interest margin will also increase. The research of Smirlock (2010) showed that market concentration has no influence on ROA, meanwhile market share influences ROA in USA banking. This means USA banking refused the SCP hypothesis because the banking has operated efficiently. Meanwhile Batthi the research of Batthi (2010) showed that market concentration influences ROA, while the market share has no influence on ROA in Pakistani banking. This means Pakistani banking still adopts SCP hypothesis because the banking still operates collusively. Based on the literatures, the hypothesis of this study can be stated as follows:

- H1: Concentration ratio of deposits market has positif impact on banking profitability
- H2: Concentration ratio of credits market has has positif impact on banking profitability
- H3: Individual market share of deposits market has has positif impact on banking profitability
- H4: Individual market share of credits market has an has positif impact on banking profitability

3. Research Method and Analysis

3.1 Type of Research

This research is an empirical study at Indonesian commercial banking listed in Bank Indonesia in a period of 2001-2012.

3.2 Types and Sources of Data

The data used in this research is secondary data panel (time series and cross sectional) in the form of financial statements which includes all Indonesian commercial bank which listed in Bank Indonesia in the period of 2001-2012. The data are taken from Indonesian Banking Directory from 2003 to 2013.

3.3 Population and Sampling

This research population is Indonesian commercial banks in the period of 2001-2012. To be specific, the table of population and sampling is listed below.

Table 1. Population and Sampling

No.	Sampling	Information
1	Population	Indonesian commercial banks listed in Bank Indonesia in a period of 2001-2012.
2	Sampling Technique	Purposive sampling
3	Sample Selection Criterias	Indonesian commercial banks which had complete data in the period of 2001-2012. Indonesian commercial banks which operate in conventional banking system. The reported financial statements contain basic variables needed for research purposes.
Indonesian commercial banking listed in Bank Indonesia (2001-2012)		120
<i>Less:</i>		
Did not have complete data from 2001 to 2012		8
Islamic banking system		10
Did not have basic variables which are needed for research purposes		1
Total Sample		101

3.4 Variables

The dependent variable in this research is profitability which can be represented by Return of Assets (ROA). The independent variables in this research is market structure represented by concentration ratio (CR10) and market share ratio (MS). Concentration ratio is the combination of biggest market shares which will establish a concentration level in the market. In this research, the used variables of market concentration are concentration ratio of deposits (CR10d) and concentration ratio of credits (CR10c). The operational definition of market share is a value percentage of selling or purchases specific goods or services controlled by business to the relevant market in a particular calendar year. Here, the variable used is market share of deposits (MSd) and market share of credits (MSc).

The other variables are included as control variable, which are CAR, LDR, and NPL. Capital Adequacy Ratio (CAR) shows the ability of bank in solvability. CAR will determine the bank's capacity in meeting the time liabilities and other risks such as credit risk to protect the bank's depositors and other lenders. Loan to deposit ratio (LDR) will show the intermediation function of bank in dispensing credits from surplus unit. Non-performing loans (NPL) is the credits which turn to be default credits.

3.5 Data Analysis Technique

This study uses panel data regression, there is analysis data procedures of panel data regression with the objectives as follows:

- To determine Pool Least Square (PLS) Model, Fixed Effect (FE) Model, and Random Effect (RE) Model.
- To select the best model among PLS, FE, and RE.
- To do a BLUE Test to the best model by using multicollinearity

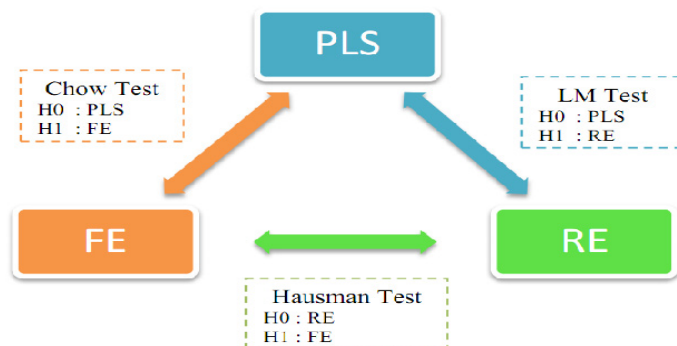


Figure 2. Selecting the best panel model

3.5.1 Multicollinearity

To find out the multicollinearity problem, this research uses VIF Test in STATA 10 as a detection tool. If the result shows that $VIF > 10$, it will mean that the variable still has multicollinearity.

3.5.2 Heteroscedasticity and Autocorrelation

Random effects model does not have to be tested again for heteroscedasticity and autocorrelation because STATA 10 has processed it within GLS-regression in the previous test. The step that should be done in this section is noticing the P probability in the random effects model and fit it with these hypothesizes stated below:

Ho: No Heteroscedasticity

H₁: Heteroscedacity

Ho: No Autocorrelation

H₁: Autocorrelation.

When P probability > alpha means Ho is rejected.

d. If the best model does not fulfill BLUE criteria, robustness standard error should be included into the test.

e. Interpretation of the best model or robust output.

3.5.3 Global Test (F-stat)

This test is to examine whether the chosen model can be used or not in research. If the result of Probability F-stat is less than alpha, then the model can be used.

3.5.4 T-test (T-stat)

This test is to examine whether each independent variables can significantly affect dependent variable or not. If Probability T-stat is less than alpha, the variable independent can significantly influence the dependent variable.

3.5.5 See the R² Value

In the output, R² shows how much all independent variables affect dependent variable. If the chosen model is PLS, see the R². If it is fixed effect model, see R² within. Meanwhile if the chosen model is random effect, see the R² overall.

According to Bhatti (2010) in his research of SCP in Pakistani banking, traditional SCP (Harvard Paradigm) will be shown by the significance of market concentration and insignificance of market share:

Credits market channel:

$$\alpha_1 > 0, \quad \alpha_2 = 0$$

Deposits market channel:

$$\beta_1 > 0, \quad \beta_2 = 0$$

Meanwhile, the efficiency of SCP hypothesis (Chicago Paradigm) will be shown by the insignificance of concentration ratio and significance of market share.

Credits market channel:

$$\alpha_1 = 0, \quad \alpha_2 < 0$$

Deposits market channel:

$$\beta_1 = 0, \quad \beta_2 < 0$$

Thus α_1 or $\beta_1 > 0$; α_2 or $\beta_2 = 0$ supports the traditional hypothesis whereas α_1 or $\beta_1 = 0$, α_2 or $\beta_2 > 0$ supports the efficient structure. However, some events appear as an interesting case whereas:

Credits market channel:

$$\alpha_1 > 0, \quad \alpha_2 > 0$$

Deposits market channel:

$$\beta_1 > 0, \quad \beta_2 > 0$$

This means both concentration ratio and market share are significant towards profitability. The bank can reach profit because of a good market structure and individual efforts.

4. Research Result and Discussion

4.1 Selecting the Best Model

The first step of this test is selecting the best model between PLS model and fixed effects model by doing Chow Test. After doing Chow Test, the next step is doing Langrange Multiplier (LM) Test which has the purpose to select the best model between PLS and random effects. Usually, the chosen models from those two tests would be fixed effects model and random effects model. Therefore, the next common test is by doing Hausman Test to choose the best model between fixed effect and random effect. The table stated below presents the selection process among PLS, fixed effect, and random effect to be the best model of panel regression.

Table 2. The selection process of panel regression model (deposits channel)

Models	Hypothesis	Deposits Channel	
		Result	Result
PLS vs FE (Chow Test)	H_0 : PLS; H_1 : FE	H_0 is rejected	FE
PLS vs RE (LM Test)	H_0 : PLS; H_1 : FE	H_0 is rejected	RE
FE vs RE (Hausman Test)	H_0 : RE; H_1 : FE	H_0 is accepted	<u>RE</u>

Table 3. The selection process of panel regression model (credits channel)

Models	Hypothesis	Credits Channel	
		Result	Result
PLS vs FE (Chow Test)	H_0 : PLS ; H_1 : FE	H_0 is rejected	FE
PLS vs RE (LM Test)	H_0 : PLS; H_1 : FE	H_0 is rejected	RE
FE vs RE (Hausman Test)	H_0 : RE ; H_1 : FE	H_0 is accepted	<u>RE</u>

The table presents selection process of choosing the best model of panel regression which happens to be random effect model both for deposits market channel and credits market channel. The next step is to find out whether the chosen model still has problems of multicollinearity, autocorrelation, and heteroscedasticity by doing BLUE test.

4.2 BLUE Test

BLUE Test will be the next test which has a purpose to detect multicollinearity, heteroscedascity, and autocorrelation problems in the models. However, according to Suwardi (2011) the random effect model does not have to be tested again for heteroscedasticity and autocorrelation because STATA 10 has processed it within GLS-regression in the previous test. Therefore, BLUE test will be done only for multicollinearity test. Table 4

presents the resume output of BLUE Test for random effect model.

Table 4. BLUE test of random effect model

Deposits Channel	Credits Channel
Result	Result
VIF Value 2.90. There is no multicollinearity	VIF Value 2.94. There is no multicollinearity

The value of the variance factor (VIF) of all variables is less than 10 for both deposits market channel and credits market channel, which means this model has no multicollinearity and does not need to be included to do robust standard error test.

4.3 Panel Regression Analysis

Table 5. Resume of research output

Independent Variable	<i>Deposits Channel</i>	<i>Credit Channel</i>
	Dependent Variable: ROA	Dependent Variable: ROA
	Coefficient	Coefficient
Constanta	-1.3587	4.8135*
CR10d	0.0659*	
MSd	-0.1317	
CR10c		-0.0275
MSc		0.0296
CAR	-0.0005	-0.0006
LDR	-0.0009	-0.0018
NPLG	-0.0949*	-0.0896*
P-value Wald	0.0000	0.0000
R ²	0.0619	0.0579

*Significant at 1% error

4.4 Research Hypothesis Testing

Global Test. The random effect outputs obtained from STATA 10 are analyzed and assessed quantitatively. In deposits market channel, the output of random effect contains Prob < chi² at 0.000, it is less than alpha (0.05) which means the model can be used. The same result comes from credits market channel which has Prob < chi² at 0.000, it also less than alpha so that the model also can be used.

4.5 T-Test

This test has the purpose to see the significancy of each independent variables towards dependent variable. If Prob-t is less than alpha, it means the independent variable has a significant influence on dependent variable. The result of hypothesis testing in this study were as follows:

4.5.1 First Hypothesis Testing

Calculations with STATA 10 obtained that concentration ratio of deposits market channel has significance value at 0.002. This value is less than 0.05 which can be concluded that concentration ratio variable has a significance influence on ROA variable. Then the first hypothesis which stated that concentration ratio of deposits market channel has an influence on ROA is accepted.

4.5.2 Second Hypothesis Testing

Meanwhile in credits market channel, concentration ratio of deposits market channel has significance value at 0.301. This value is more than 0.05 which can be concluded that concentration ratio of credits market channel

variable has no significant influence on ROA variable. Then the second hypothesis which stated that concentration ratio of deposits market channel has an influence on ROA is rejected.

4.5.3 Third Hypothesis Testing

Calculations with STATA 10 obtained that concentration ratio of deposits market channel has significance value at 0.812. This value is more than 0.05 which can be concluded that individual market share of deposits market channel variable has no significance influence on ROA variable. Then the third hypothesis which stated that individual market share of deposits market channel has an influence on ROA is rejected.

4.5.4 Fourth Hypothesis Testing

Calculations with STATA 10 obtained that concentration ratio of deposits market channel significance value at 0.661. This value is more than 0.05 which can be concluded that individual market share of credits market channel variable has no significance influence on ROA variable. Then the fourth hypothesis which stated that individual market share of credits market channel has an influence on ROA is rejected.

4.5.5 R² Value

Based on STATA 10 output, the R² Overall in random effects model for deposits market channel is at 0.061 which means the independent variables and banking characteristics observed can explain dependent variable at 6.1%. The other 93.9% is explained by other variables which is not included in this research. Meanwhile in credits market, the R² Overall in random effects model is at 0.057 which means the independent variables and banking characteristics observed can explain dependent variable at 5.7%. The other 94.7% is explained by other variables which is not concluded in this research. This small value is in accordance with a few of significance variables in this research.

4.6 Research Discussion

4.6.1 Concentration Ratio of Deposits Market Channel (CR10d) and Profitability (ROA)

Testing hypothesis of concentration ratio of deposits market channel obtained result that concentration ratio of deposits market channel has a positive significant relationship towards ROA in 95% level of confidence. It means that if concentration ratio of deposits market increases, ROA will also increase. The concentration ratio coefficient is 0.0659 which means if there is 1% increment of concentration ratio while the other variables are constant, ROA will increase at 0.0659. This condition is normal because the escalation of market concentration will make profitability higher, but if concentration ratio keeps increasing to monopoly market structure, this is not good for banking industry.

Based on data of Bank Indonesia, concentration ratio of deposits market decreased from 2001 to 2012 which means profitability also statistically decreased. Even though the relationship between concentration ratio of deposits and profitability is normal, but this condition is bad because the more top ten banks decrease their controls in banking industry, the more profitability of individual bank will decline. Raising the control of big banks in banking industry to increase profitability is also not a good choice.

4.6.2 Concentration Ratio of Credits Market Channel (CR10c) and Profitability (ROA)

Testing hypothesis of concentration ratio of credits market channel obtained result that concentration ratio of credits market channel has no significant effect on ROA in 95% level of confidence. However, concentration ratio of deposit has a negative effect even though it is not significant. It means that if concentration ratio of credits market increase, ROA oppositely will decrease but it is not significantly be influenced. This is not a normal condition because the normal situation happens where the escalation of concentration ratio will make profitability higher.

The insignificance of credits concentration ratio occurs because the quality of earning assets is still low. The credits distributed by ten biggest banks to consumers does not return with some quality so that the interest income does not influence ROA. In fact, based on data of Bank Indonesia, concentration ratio of credits market fluctuated but mostly increased which statistically means profitability decreased from 2001 to 2012. This decline of profitability occurred because of the high overhead cost which also appeared to increase. Even though the financial report shows that overhead cost still can be covered by net interest income which comes from a high credits price, but statistically the increment of net interest income is still not strong enough to increase profitability.

4.6.3 Individual Market Share of Deposits Market Channel (MSd) and Profitability (ROA)

Testing hypothesis of individual market share of deposits market channel obtained result that individual market

share of deposits market channel has no significant effect on ROA in 95% level of confidence. However, individual market share of deposits has a negative effect even though it is not significant. It means that if individual market share of deposits market is higher, ROA will decrease but not significantly be influenced. This is not a normal condition whereas the escalation of individual market share will make profitability higher.

Individual market share shows the percentage of control of individual bank in banking industry. The good market share of deposits will show the conduct of banking in raising total deposits. However, the panel regression result shows that market share of deposits does not significantly influence ROA. Based on the data of Bank Indonesia, individual market share of deposits decreased from 2001 to 2012 which means profitability statistically increased in the same period even though it is not significant. From theory and the other researches, this insignificance occurs because deposit products of individual banks still can not attract consumers to save their money in deposits market. The low individual market share of deposits market causes the low interest expense that should be paid and this will make the net interest income increases.

4.6.4 Individual Market Share of Credits Market Channel (MSc) and Profitability (ROA)

Testing hypothesis of individual market share of credits market channel obtained result that individual market share of credits market channel has no significant effect on ROA in 95% of level confidence. However, individual market share of credit has a positive effect even though it is not significant. It means that if individual market share of credits market is higher, ROA will also increase but not significantly be influenced. This is already a normal condition whereas the escalation of individual market share will make profitability higher, however credits market share still does not significantly impact ROA. A positive effect of credits market share indicates the cost efficiency and the fee based income is in a good condition. In other words, credits market share of banking industry is in a normal stage. Based on the data of Bank Indonesia, individual market share of credits is mostly increased from 2001 to 2012 which means profitability is also statistically increased. The main problem is the insignificance effect of individual market share on ROA, this condition occurs because of the differentiation of credit products that still can't attract consumers to take loans from credits market. The loans distributed to consumers is usually for consuming needs, not for investment which should give an impact of earnings assets on banking.

4.6.5 Testing of Indonesian Banking Industry SCP

In deposits market channel, the result of significance test of concentration ratio variable (α_1) significantly influences ROA meanwhile market share variable (α_2) does not significantly influence ROA.

$$\alpha_1 > 0, \quad \alpha_2 = 0$$

This result means deposits market channel of Indonesian banking industry is still in the SCP traditional condition where the structure is the only one which influences profitability, not the efforts from internal factor like in SCP efficiency.

Meanwhile in credits market, the result of significance test of concentration ratio variable (β_1) does not significantly influence ROA and market share variable (β_2) also does not significantly influence ROA.

$$\beta_1 = 0, \quad \beta_2 = 0$$

This results of credits market is included as unidentified SCP because there is no such model criteria in SCP theory. The fact that concentration ratio and market share do not significantly influence ROA means Indonesian banking in credits market share is not in a normal condition.

4.6.6 Capital Adequacy Ratio (CAR) on Profitability (ROA)

Testing hypothesis of capital adequacy ratio (CAR) obtained result that CAR has a insignificant negative relationship towards ROA in confidence level of 95%. It means that if CAR increases, ROA will decrease but it is not significantly be influenced. Logically, this is normal because the concentrated money in CAR will make bank lost an opportunity to make innovation in expanding its business. The minimum of CAR is at 8%. However, there are too many banks which reserves CAR more than 8%. This condition is not always good, even though the solvability of banking is safe but the money which is allocated in CAR will be useless and bank can lost an opportunity in using its money to make other the development of its business which has a purpose to increase profitability.

4.6.7 Non-performing Loan (NPL) and Profitability (ROA)

NPL Gross has a significant negative relationship with ROA in confidence level of 95%. The coefficient of NPL Gross is -0.094, which means if there is any 1% additional of NPL Gross. ROA will decrease at -0.094. This result supports the normal condition whereas NPL Gross generally will affect negatively towards profitability.

The lower NPL Gross, the citizen tendency to give third party funds to banking industry will be higher because a low NPL shows a good performance in banking management and this will make citizen take a strong trust on banking industry to give their deposits. This condition normally will increase ROA.

4.6.8 Loan to Deposits Ratio (LDR) and Profitability (ROA)

LDR is the proxy of intermediation function of banking industry which means it is the main function. The result of this research shows that LDR is not significant on ROA with negative effect. If there is an increment of LDR, it will negatively affect ROA but not occurring a significant influence. A negative effect is an opposite expectation because the more loans distributed to defisit unit, the more banking will get interest income. In fact, the negative effect indicates that the more loans distributed to defisit unit, the more the risk for non-performing loan is higher. The data of Bank Indonesia shows the trend of LDR which increased from 2001 to 2012, which means ROA decreased for individual bank. This condition shows the principle of distributing credits is not implemented well because the good condition is when loans successfully creates interest income and has a significant effect on ROA. A good thing of this fact is this relationship is not significant.

5. Conclusion

From the research results of data analysis that had been done, it can be seen that the only significant variable of performance is concentration ratio of deposits while the other variables have no significant on performance. Based on these conclusions, it can be stated that Indonesian banking industry in deposits market still operates in traditional SCP. Meanwhile, credits market is in unidentified SCP condition because both concentration ratio and market share are not significant in ROA. The main variables of banking characteristics which significantly influence ROA is only earning assets shown by the significant negative effect of NPL towards ROA.

The fact that concentration ratio of deposits is significant towards profitability indicates that Indonesian commercial banking still rely on deposits market to make profit. If this continues happening, bank can make deposits price lower and the credits price will be higher. Bank Indonesia should make a restructure of market structure in Indonesian banking by focusing big banks to open new branches overseas to give some spaces for the small banks in increasing the deposits market of small banks. The big banks which open more branches domestically will only make small banks in bankruptcy or merger and competitiveness in banking industry will be lower. If this condition keeps continuing, there will be monopoly structure in Indonesian banking and the big banks can determine credits and products in their own willing. By opening other branches overseas, the big banks can expand their business internationally, meanwhile the small banks can make a lot size in Indonesia.

Bank naturally will be in a health competition if the market structure has changed into perfect competition by doing the restructure of market structure. The concentrated banks will not make a higher credits price, so that net interest income will be normal. Banks should be more creative in searching fee based income and controlling more overhead cost in order to keep the banking efficiency. Therefore, the role of banks as intermediation will be done completely. The business investment will open widely and the unemployment will decrease. In the end, economics democracy will be happening in Indonesia.

This fact that individual market share is negatively significant on ROA which means there is no efficiency cost in creating deposits product, this condition naturally will not impact ROA. To make individual market share of deposits market higher and significant on ROA, banks should increase the differentiation products of deposits market. However, the overhead cost should be efficient so that profit will not decrease. The individual market share of credits which is already positive but not significant towards ROA indicates that the overhead cost in creating credits product which already efficient even though it is still not impact ROA. Therefore, the steps could be taken is only increasing the market share of credits through differentiation of credits market products to gain more profit.

Assets quality as the main engine of individual banks needs to be maintained so that loan growth is not followed by the increment of NPL. To maintain the NPL, the banks should still strict in distributing credits to the consumers and the investors should be feasible, therefore interest income will be higher and ROA also will increase. In addition, the distribution of credits from deposits should still be increased by considering the principles of credits distribution because the risk in distributing credits is always exist. Then, excess of capital adequacy can be decreased to the minimum percentage according to regulation (8%) and it is better to allocate CAR to earnings assets so that the opportunity in receiving loan will be higher rather than storing the money in capital.

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