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Industry Market Structure and Banking Performance in Indonesia

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ABSTRACT

After the economic crisis, Indonesian banks began to compile the Indonesian Banking Architecture to design Indonesian banking system. Often banks have a motive to increase their market share by increasing the amount of third party funds and the amount of credit extended, thus changing the character of the banking market structure in Indonesia. This study measures the effect of performance as reflected in the level of bank profitability in relation to the market structure, assuming these conditions are influenced by internal (Asset Liability Management) and market factors. Bank market concentration is measured by the Herfindahl-Hirschman Index. The research concludes that banking in Indonesia has a monopolistic market structure. The effect of bank market concentration, capital ratio, and liquidity ratio are positive and significant on bank performance. Conversely, the credit risk ratio had a negative effect to banking performance.

Keywords: capital ratio, liquidity ratio, credit risk ratio, market concentration

1. Introduction

In January 2004, Bank Indonesia issued the *Arsitektur Perbankan Indonesia* (API) policy with the aim of banks being able to reach economic scale and increased the positivity of banking system. The growth in several banks led to intense competition and pushed a number of banks out from the market or joining the others. Through the increase of total third party funds and credits given by the bank, the development of bank profitability (Return On Asset) comes in return.

Based on research by Mala (2017) and Jumono et al. (2016) it is stated that banks in Indonesia have an oligopoly market structure and in fact the biggest factor affecting banking performance is ROA. However, Mulyaningsih & Daly (2012) concluded different things, the results of the study showed that banks in Indonesia were in a monopolistic condition during 2001-2009.

Lee, Hsieh, (2014) used bank competition and bank profitability variables, with the results of the research proving that a higher change in market structure will increase bank profits. Research Adelopoetal. (2018) and Pinto et al. (2017) show that the dynamics of bank

profitability are related to internal and external factors of the bank. They conducted research using the basic logic of the performance implementation structure paradigm and using neoclassical theory that considers and adjusts the market and economic conditions of a country. According to Kuo (2004), the measurement of bank performance is reflected in the measurement of the resulting level of profitability. The measurement indicator commonly used to measure bank profitability according to Ostadi & Monsef (2014) is the Return On Asset (ROA) approach.

Research on the impact of external banking activities on bank profitability was also conducted by Pervana et al. (2015) and Bougatef & Korbi (2018). Pervana et al. (2015) researched the influence of macroeconomic factors as reflected by the exchange rate on customer behavior as reflected by the deposit interest rate. Pinto et al. (2017) show that profitability is influenced by capital adequacy and financial leverage.

According to Gugler & Peev (2018), generally in developing countries the role of banks in mobilizing funds is more dominant than the role of the capital market. The role of banking in the economy in developing countries like Indonesia is very important. Karim & Alam (2013) research results show that the banking industry in Indonesia with economic movements in Indonesia has a correlation close to one. The results of Ally (2014) study show that the type of bank ownership in Indonesia has a significant effect on bank performance.

Based on this facts, the measurement of bank performance is very necessary, especially for shareholders, creditors, consumers, and the government. The results of the research by (Ben Selma Mokni & Rachdi (2014) showed that the use of fundamental analysis can be done to measure performance, which is by analyzing financial statements using financial ratios.

This study measures the effect of performance as reflected in the level of bank profitability in relation to the market structure in Indonesia, with the assumption that it is influenced by internal conditions (ALMA) and external conditions (market and macroeconomic factors). The orientation of this research is how the market structure of banks in Indonesia is related to the type or profile of ALMA from time to time where the bank must maintain its position at the level of BUKU 1,2,3, and 4. What distinguishes this research is to analyze the relationship between ALMA and structure market in Indonesia with the following problems limitation : 1) What is the level of concentration or market structure of banks in Indonesia? 2) How is the effect of concentration or market structure of banks in Indonesia on profitability? 3) How are the impacts of CAR, NPL, and LDR on the profitability of banks in Indonesia?

2. Literature Review and Hypothesis Development

2.1. Literature Review

Neuberger (1998) in Bucevska and Bucevska & Hadzi Misheva (2017) create an SCP (Structure Conduct Performance) framework that can adapt to the situation of bank characteristics. As an intermediary institution, banks deal with agency problems such as overcoming imperfections in existing information. Another unique benefit of the banking industry is that it is highly regulated and has to follow strong regulations in addition to public policy.

Based on the above, the relationship between structure, behavior and performance is mutually sustainable, where the structure of an industry has a correlation with the industry's behavior which in turn will affect the performance of the industry concerned. The variables that affect the market structure include economic scale, market concentration, product differentiation, capital intensity, export and import market [see Yudaruddin (2014)].

Bikker et al.(2014) stated that the level of banking concentration can be measured by the

concentration ratio. The concentration ratio can indicate the changes in concentration as a result of the entry of all banks into the market or exit from the market or the merger and exit of all banks from and into the market.

Jacobson and O'Callaghan (1996:53) describe the concentration method, namely CRN or N firm concentration and the Herfindahl-Hirschman Index. The Herfindahl-Hirschman Index (HHI) is the most extensive measurement indicator in terms of concentration theory and is often used as a benchmark for evaluating other concentration indices. This guideline implies that the post-merger market does not exceed 0.18, and the increase in the index from the pre-merger is less than 0.02 as suggested by Cetorelli and Gambera (2001), with the following formula :

$$HHI = \sum_{i=1}^k Si^2$$

Si^2 shows the square of the size of the bank which is measured as market share.

The banking concentration is a bank whose operational activities are more focused on customers or large companies or even small and medium companies. Banking concentration is measured by the herfindahl-hirschman index (HHI), which is the sum of all market shares.

Fang et al. (2019) found that commercial banks in China with a high level of insolvency risk have greater profitability (ROA and ROE), this study finds that higher competition triggers lower profitability in the industry. Chinese banks, and Chinese commercial banks with higher levels of cost efficiency have higher ROA.

Profitability is valued as an intermediary target to achieve the main goal, namely to maximize the value of the company according to other research (Artha & Mulyana, 2018; Salvatore, 2015). Optimal profitability is one of the banking activities in managing bank asset liability (Asset Liability Management = ALMA), a variable from the research that acts as a proxy for banking activities. This is also relevant because ALMA is a guide in managing internal resources with external conditions, such as dynamic market conditions and other conditions.

Gavurova et al. (2017) used a theoretical framework regarding the factors that affect profitability in line with industry characteristics, the level of concentration of the banking market and macroeconomic variables. (Ally, 2014) shows that the more centralized the market is, the more likely it is to achieve normal profitability and market efficiency.

2.2. Hypothesis Development

The results of Simatele (2015) study shows that concentration affects traits. The relationship between profitability and structure is dominantly explained by the structure in doing the hypothesis.

The following is a picture of a research framework that explains the formulation of the hypothesis:

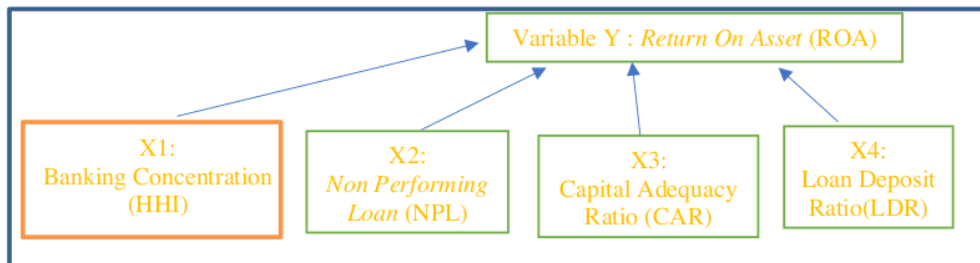


Figure1. Research Framework
Data Analysis, 2020

Figure 5. describes the formulation of the research hypothesis as follows: According to Ally (2014), the more centralized the market is, the more likely it is to achieve normal profitability and market efficiency. However, it is different from Smirlock's(1985) research which observes that the relationship between the level of market concentration and the level of bank profitability is not related to banking. Based on the above, hypothesis 1 and 2 research can be formulated as follows:

- H1: The banking market structure in Indonesia is concentrated in the Herfindahl-Hirschman Index
- H2: Herfindahl-Hirschman Index (HHI) has an effect on Return On Assets

Yanuardi et al.(2014) conducted research using the Risk of credit, Capital, and Inflation variables which have a significant positive effect on profitability as measured by ROA. The results of Buchory (2016) show that the Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), and Operating Expense to Operating Income (OE/OI) variables have a positive effect on Return On Assets (ROA). Based on the above, the 3 research hypothesis can be formulated as follows:

- H3: Non Performing Loans, Capital Adequacy Ratio, and Loan Deposit Ratio (LDR) have an effect on Return On Assets.

3. Research Method

This research is categorized as an application research with the aim of applying the results from previous researchs hypothesis Etale et al. (2016). In measuring the level of market competition from the banking industry, this study proposes three theoretical approaches, namely: the traditional hypothesis approach, the difference hypothesis, and the efficiency hypothesis. The traditional hypothetical theory assumes that a large concentration of the market can lead to low costs which create a habit of collusion. The difference hypothesis theory assumes that the more efficient the company will obtain a larger market share and gain more profitability. While the efficiency hypothesis theory assumes that market share and market concentration are representative of the efficiency of the company, so it is more efficient to get a larger market share and market concentration.

The basic idea of making a relationship between profitability with internal factors (the nature and operation of the bank) and external factors (market structure and basic conditions) refers to the SCP theory. The economic model in this study also refers to Dungey & Gajurel (2015) testing the SCP theory in commercial banks with a regression model. This model is modified and adapted in this study to suit conditions in the Indonesian banking sector.

The reason for using the 8-year timeframe for this study is because Indonesian banks have different values and measures for each unit with a large number of frequencies throughout the time period according to BUKU 1,2,3,4. The sample selection technique used purposive sampling technique.

The research data is taken from the financial statements of banking companies registered with the Financial Services Authority for 8 years. Based on the criteria obtained more than 58 banks that meet, so that the total research data can be more than 464 observations.

The following is a research equation model:

$$ROA_{i,t} = \beta_0 + \beta_1 HHI_{i,t} + \beta_2 NPL_{i,t} + \beta_3 CAR_{i,t} + \beta_4 LDR_{i,t} + e_{i,t}$$

Table 1. Operational Variable

No	Variable	Definition	Indicator	Measure	Scale
Dependent Variable					
1.	Public Bank Profitability	The ability of public bank to gain profit	ROA	Net income divided by total assets	Ratio
Independent Variable					
1.	Banking industry market concentration	Banks whose operations are more specialized in large corporate customers	<i>Herfindahl-Hirschman Index (HHI)</i>	The square sum of all market shares	Ratio
2.	Bank Financial Ratios	Comparison of bank business in order to improve bank performance	NPL (<i>Non Performing Loan</i>)	Total non-performing loans divided by total loans extended	Ratio
			CAR (<i>Capital Adequacy Ratio</i>)	Total bank divided by total Risk Weighted Assets	Ratio
			LDR (<i>Loan Deposit Ratio</i>)	Total credit divided by total deposit	Ratio

Source: adapted from Cetorelli and Gambera (2001) and Taswan (2015)

4. Result and Discussion
4.1. Descriptive Statistics Result

Table 2.
Descriptive Statistics

	ROA	HHI	CAR	NPL	LDR
Mean	2.212435	0.099144	19.64218	1,225776	87.67935
Median	2.225000	0.092550	17.57000	0,805000	86.92000
Maximum	7.440000	0.210560	82.50000	9,650000	251.1000
Minimum	-11.15000	0.070070	0.180000	-3,390000	0.680000
Std. Dev.	1.850741	0.037390	8.121614	1,310894	22.70054
Skewness	-1.608692	2.258755	2.355414	1,948579	2.208968
Kurtosis	11.73484	6.794435	14.20647	10,57995	21.05830
Jarque-Bera	1675.214	672.9089	2857.018	1404.441	6681.991
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1026.570	46.00293	9113.970	568.7600	40683.22
Sum Sq. Dev.	1585.886	0.647278	30539.77	795.6389	238590.7
Observations	464	464	464	464	464

Data Analysis (2020)

Based on Table 2, it is identified that banks in Indonesia have a very healthy banking performance from 2009-2016. This is reflected in the NPL value of 1.225776 which indicates that based on the criteria for determining the risk profile rating of banks in Indonesia are very healthy because they are in an NPL position $< 2\%$ (PBI No. 6/23 / DPNP 2004). The NPL variable has a mean value of 1.225776 and a median value of 0.805000 with a standard deviation of 1.310894. The maximum value is 9.650000 and the minimum value is -3.390000.

An LDR of 87,67935 indicates that the criteria for banks in Indonesia in terms of the Loan Deposit Ratio (LDR) of these banks are in a fairly healthy criteria, as evidenced by the LDR value of banks in Indonesia which are categorized as quite healthy banks ($85\% < \text{LDR} \leq 100\%$). The LDR variable has a mean value of 87,67935 and a mean value (median) of 86.92000 with a standard deviation of 22,70054.

CAR of 19,64218 indicates that banks in Indonesia are in a very healthy position, namely the CAR value of banks in Indonesia (19,64218) $> 12\%$. The CAR variable has a mean value of 19.64218 and a median value of 17.57000 with a standard deviation of 8.121614.

Likewise, the ROA value of banks in Indonesia is 2,212435, indicating that the bank is categorized as very healthy, as seen in the ROA of banks in Indonesia (2,212435) which are classified as very healthy banks ($\text{ROA} > 1.5\%$). The ROA variable has a mean value of 2.212435 and a median value of 2.225000 with a standard deviation of 1.850741. The HHI variable has a mean value of 0.099144 and a middle value (median) of 0.092550 with a standard deviation of 0.037390.

4.2. Model Analysis

Table 3.
Chow Test

Effects Test	Statistic	d.f	Prob
Cross-section F	8.76835	(57,402)	0.000
Cross-section Chi-square	374.88241	5	0.000

Data analysis (2020)

Table 3 shows the probability that the Chi-square cross-section is 0 so that the panel data regression model that should be used is the fixed effects model or random effects model so that the panel data regression model testing will be continued using the Hausman test.

Table 4.
Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Cross-section random	35.97862		0.000

Data analysis (2020)

Table 4 shows that the probability of random cross-section is 0 so that the panel data regression model that should be used is the random effects model.

Table 5.
Regression Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.865324	1.268204	-4.624905	0.0000
HHI	70.67678	11.78111	5.999160	0.0000
CAR	0.009362	0.010915	0.857757	0.3915
NPL	-0.210570	0.060033	-3.507560	0.0005
LDR	0.013056	0.003915	3.335403	0.0009
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.629575	Mean dependent var	2.212435	
Adjusted R-squared	0.573366	S.D. dependent var	1.850741	
S.E. of regression	1.208852	Akaike info criterion	3.341029	
Sum squared resid	587.4524	Schwarz criterion	3.894203	
Log likelihood	-713.1188	Hannan-Quinn criter.	3.558779	
F-statistic	11.20064	Durbin-Watson stat	1.083950	
Prob(F-statistic)	0.000000			

Data analysis (2020)

Table 5. The regression equation shows the results of multiple linear regression analysis using a fixed effect model. The regression equation used in this study refers to the results of the multiple linear regression analysis above which are:

$$\text{ROA} = -5.865324 + 70.67678 \text{ HHI} - 0.210570 \text{ NPL} + 0.009362 \text{ CAR} + 0.013056 \text{ LDR}$$

HHI has a positive regression coefficient value of 70.67678. The positive value contained in the regression coefficient indicates that HHI has a positive effect on ROA. An increase in the value of the HHI by one unit will result in an increase in the ROA value of 70.67678.

NPL has a regression coefficient value of negative 0.210570. The negative value contained in the regression coefficient indicates that NPL has a negative effect on ROA. An increase in the NPL value by one unit will result in a decrease in the ROA value of 0.210570. Conversely, the ROA value will increase by 0.210570 when the NPL value decreases by one unit.

CAR has a regression coefficient value of 0.009362. The positive value contained in the regression coefficient shows that CAR has a positive effect on ROA. An increase in the CAR value by one unit will result in an increase in the ROA value of 0.009362.

LDR has a regression coefficient value of 0.013056. The positive value contained in the regression coefficient indicates that LDR has a positive effect on ROA. An increase in the LDR value by one unit will cause the ROA value to increase by 0.013056.

The simultaneous test result (F test) is a test conducted to determine whether all independent variables are simultaneously able to influence the dependent variable used in the study. The probability value (F-statistic) is the value that is considered in carrying out the test simultaneously (F test). This study uses a confidence level of 95%. The probability value (F-statistic) < 0.05 indicates that H0 is rejected.

The regression coefficient shows a probability (F-statistic) value of 0.000000. The probability value (F-statistic) < 0.05 indicates that H0 is accepted so that HHI, NPL, and LDR are simultaneously influencing ROA. The probability value is the value that is considered in doing the partial test (t test). This study uses a confidence level of 95%. A probability value < 0.05 indicates that H0 is accepted.

The regression coefficient shows that HHI, NPL, LDR have a probability value < 0.05, indicating that H0 is accepted so that HHI, NPL, and LDR are partially able to influence ROA. Table 5.5. The regression coefficient shows that CAR has a probability value of 0.3915. A probability value > 0.05 indicates that H0 is rejected so that CAR is partially unable to influence ROA.

The Adjusted R-squared value of 0.573366 indicates that the independent variables in this study, namely HHI, NPL, CAR, and LDR are able to explain the dependent variable in this study, namely ROA of 0.629575 or 62.96%. The dependent variable used in this study, namely ROA, is also influenced by other factors besides HHI, NPL, LDR, and CAR of 0.3704 or 37.04%.

4.3. Discussion

The orientation of this research is to know the market structure of the banking industry in Indonesia related to the type or profile of the Asset Liability Management (ALMA) from time to time where the bank must maintain its position at the level of BUKU 1,2,3, and 4. The variables in this study consist of: the dependent variable, namely profitability. domestic banks as measured by Return on Asset (ROA) and independent variables: Non Performing Loan (NPL), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), and banking industry market concentration as measured by the Herfindahl-Hirschman Index (HHI).

Descriptive statistics at table 2 shows that a bank's LDR is 87,67935, indicating that the bank is directed towards a monopolistic type, where the bank is a bank that has a low market share in terms of the amount of third party funds. If the amount of credit disbursed, it can be seen that the Loan Deposit Ratio (LDR) value is > 100%, then the bank leads to the oligopoly type Mala (2017). A bank like this will continue to strive to increase the Herfindahl-Hirschman Index (HI) value so that it remains the leader in its industry. Monoploistic banks will maximize the value of ROA by increasing CAR, tightening Non-Performing Loans (NPL), and increasing LDR Mala (2017).

Table 6.
Research Summary

Variable	Symbol	Prob	Sign
Non Performing Loan	NPL	0.0005	Positive
Capital Adequacy Ratio	CAR	0.3915	Positive
Loan Deposit Ratio	LDR	0.0009	Negative
Market Concentration	HHI	0.0000	Positive

Data Analysis (2020)

Based on Table 6, it is identified that the variable market concentration (HHI), credit ratio (NPL) and bank capital (CAR) have a positive effect on bank performance (ROA). This is evidenced by the probability that HHI, NPL, and CAR are smaller than the significance level (<0.05). On the other hand, the effect of the non-performing credit variable (LDR) on bank performance (ROA) is in the opposite direction (negative), meaning that the higher the Loan Deposit Ratio (LDR) causes a decrease in bank performance as reflected in the ratio of profit to bank assets (ROA).

5. Conclusion

Based on the results of the study, it can be concluded that banks in Indonesia have a monopolistic banking structure, this is evidenced by the results of the research showing that the banking market structure in Indonesia is concentrated and is related to banking performance. The results also show that the variable Capital Adequacy Ratio (CAR), Loan Deposit Ratio (LDR) has a positive relationship with banking performance (ROA), which means that banks must increase their capital adequacy ratio and provide credit to increase their banking performance. Meanwhile, the Non Performing Loan (NPL) variable has an opposite (negative) relationship, which means that banks must reduce their non-performing loans if they want to improve their bank performance.

The managerial implication of this research is that market concentration can be used to measure the increase in bank performance, however the bank capital adequacy (CAR) variable does not have a significant effect on improving banking performance in Indonesia. So that to improve further research, it is better if the variable part of the bank capital adequacy ratio (CAR) is used as a separate research topic for further research in measuring bank performance.

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