The Structure and Performance Analysis: Empirical Study on Commercial Banking in Indonesia 2010 – 2019

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I N D E X I N G	A B S T R A C T
	The purpose of this paper is to conduct the empirical study about the structure and performance of banking sector in Indonesia with several specific factors which influenced the firms and the other control variables. This study used panel data which are the secondary data, total asset, ROA, CAR, LDR, and ROE ranging from 2010 to 2019. The sources are taken in for the last ten years which is from the form of banks financial statements published by Bank Indonesia and Indonesian banking statistics published by Indonesia financial services authority as well as from annual financial statements of each bank. In order to measure structure, this paper used concentration ratio as well as HHI for four large banks, to know the performance of firm, this study used Return on Asset data, and to analyze the relationship between structure and performance, it used the simple linier regression. This paper found that Indonesia banking has a high concentration, it proved from the value of HHI is more than 2500 and the value of CR4 shows between 40% and no more than 60%. It shows that the Indonesian banking sector in Oligopoly market. Following the further, there is a negative relative between the structure and performance of firm proved the result of regression between total asset and CR4 for ten years.

INTRODUCTION

The Indonesia banking system created a regulation, the Indonesian Banking Architecture (API) aiming to protect and overcome this circumstance, derived from the monetary crisis in 1997 causing numerous banks collapsed. This policy effects on the increased of bank economic scale and major banks became less competitive due to the monopolistic market power. It extremely influences the rising of concentration's banks. A study found that the decreasing of banking competition level in Indonesia contributes to the collusive action among banks to escalate their profitability (Yudrauddin, 2012). Other policies, the minimum capital amount and sole proprietorship policy, affect directly the structure and level of competition all the banks (Belengkaehe, Engka, and Mandeji, 2014).

During 2010 – 2019 (before covid-19 effect), number of commercial banks decreased for the last decade as many as 10 banks (Table 1). Based on the data of number of commercial banks on

statistics of Indonesia's financial system on financial service authority, it is because banking in Indonesia in the past year began actively conducting business mergers, it is from 122 banks in 2010, to 110 banks in 2019. Banking Observer Paul Sutaryono said, one day, the diminishing of number of banks in Indonesia could encourage a more positive banking industry. He states to gain emphasis of reducing the number of banking fraud cases among others because supervision can be done more effectively (Sitanggang, 2019). It is known that the level of competition among banks influences the market structure in banking industry. It indicates that the market structure away from perfect competitive market becoming less competitive due to its diminishing (Belengkaehe, Engka, and Mandeji, 2014).

Table 1. Number of Commercial Banks in Indonesia

Year	Total	Total Asset (Billion)
2010	122	3,008,853
2011	120	3,652,832
2012	120	4,262,587
2013	120	4,954,467
2014	119	5,615,150
2015	118	6,095,908
2016	116	6,729,799
2017	115	7,387,634
2018	115	7,913,491
2019	110	8,562,974
2020	110	-

Source: statistics of Indonesia's financial system

In contrast, the total asset of whole banking industries increases during last 10 years. The maximum of the total asset reaches 8,562,974 billion rupiah in 2019. Meanwhile, the minimum profit was 3,008,853 billion rupiah in 2010 which is two times less than in the latest year. It can be seen that the negative relationship between the number of banks and total asset of whole countries.

The performance of banks is described by how much the profit gained by a certain bank. It is explained by the ROA (the ratio of net profit total divided by asset total). Some factors in which influence the rising of banking profitability are Capital Adequancy Ratio (CAR), Loan to Deposito Ratio (LDR), and Asset growth (Belengkaehe, Engka, and Mandeji, 2014).

Table 2. The average of bank financial ratio

Ratio	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
CAR	14.81	15.15	15.83	15.68	17.00	19.35	21.39	21.55	21.02	21.86
LDR	66.50	69.99	75.90	83.05	82.08	85.71	85.17	84.77	89.17	88.64
ROA	3.39	3.73	15.30	3.97	3.93	3.44	3.12	3.25	3.41	3.23

Source: financial statements published by Bank Indonesia

In carrying out a business activity, bank capital is one of the funding sources. However, capital also has a high risk in managing its profit effects that will be generated by the company (Belengkaehe, Engka, and Mandeji, 2014). The higher the CAR ratio, the better a bank in managing its capital, it will affect the higher financial returns. As we can see from the table 2, the ratio of CAR of the four larger banks in Indonesia increases in every year, from 14.81% to 21.86%.

The increase influences the high profitability of banking sector. From the data, it is proved that an increase in the CAR ratio does not always increase the ratio of ROA which can be seen that the average value of ROA remains at a position around above 3%, instead decreases by 0.16%, which in

the year 2010, ROA of the four banks amounted to 3.39%, whereas in 2019 decreased to 3.23 percent. Besides, the bank intermediary function is relatively improving. This can be seen from the increase in LDR to more than 88 percent in 2019. Although the bank's profit is not fully affected because the ratio is relatively constant.

In empirical study in Indonesia Banking sectors, some researcher used Return On Asset and other additional variables to measure structure, conduct and performance analysis. Naylah, (2010) measure the concentration ratio using market structure and completed with market share. This variables are also found in other research (Pertiwi, 2013) and (Nisa et al., 2019). Other author added the Credit Risk, State-owned, domestic Ownership, Foreign Ownership, and Ownership Concentration (Dianitasari and Hersugondo, 2020). All they used the Fixed Effect Method or Random Effect Method, taken banking data for 2018 and below.

Considering that it needs to explore more related the structure and performance of banking industrial market in Indonesia. It focuses only one variable, ROA, to ensure its effect towards structure bank without the effect of other variables. This research also took the latest data, a last decade (2010 – 2019) before pandemic hit Indonesian banking sector in order to see how the development of structure and performance of banking sector. Further, it could be used for analyzing the strength and weakness of the structure market in order to maximize the quality of banking sector in Indonesia.

LITERATURE REVIEW

Analysis of SCP hypothesis gives many insights in different perspectives of researchers. A study found that there some supporting in traditional SCP paradigm while the others refuse it. In Nigeria, due to the high average cost for the industry, it is found that the banking industries support the traditional SCP paradigm while refusing the efficiency performance hypothesis (Bello and Isola, 2014). In Spanish banks, it shows that the concentration ratio of Spanish bank supports the structure-conduct-performance hypothesis and is not to justify the efficiency hypothesis. (Williams, Molyneux, and Thornton, 1994). Its concentration has a low level of collusion cost between companies and earned higher than profits for all market participants. In addition, the SCP hypothesis is supported by that evidence in Pakistan banks and it is not supporting the efficient structure hypothesis on these evidences as the finding about the profitability of Pakistani commercial banks has negative relationship with (Bhatti and Hussain, 2010). This also is found that bank in Kenya where considering the efficiency of banks increases their maximum profit as it is shown on the positive value of market share (MS) towards the ROA, ROE, and NIM, but it has negative coefficient of both in Concentration ratio in the four large firms (CR4) and HHI towards the ROA, ROE, and NIM (Sahile, Tarus, and Thomas, 2015).

Furthermore, the highlight of a paper points out the increase of profit on the 5 large Indonesia banks is not influenced by the leveled concentration up of the banks where the value of ROA during the observation period went up, whereas the value of CR5 is negative (Yudrauddin, 2012). Others found that even there will be plunge assets of Bank in Indonesia, it will not affect the profit cause Return on Assets (ROA) ratio went up every year, the value of Capital Adequacy Ratio (CAR) on his observation declined yet it did not drop Return on Assets (ROA) (Belengkaehe, Engka, and Mandeji, 2014).

Further, the anti-competitive conduct banks are partially influenced by the high profit in a concentrated banking industry in ASEAN where it found that creating the market power of bank can be reached by controlling the collusive activities because that the high profit is earned by the policy implication through monopoly behavior in a concentrated market. (Khan, Ahmad, and Chan, 2018). However, other study also found that the structure-conduct-performance (SCP) hypothesis is rejected and supports the efficiency structure hypothesis (ESH) because the coefficient of Concentration Ratio (CR) is relatively negative while both market share of assets and deposits show a positive.

There are some contradicting findings of supporting hypothesis which can be used to describe the banking sector. Whether, it can support the SCP hypothesis. The others, some study discovered about the structure of banks related to the performance and efficiency. Likewise, it found some evidences about merger activity influence the structure as well as the competition. So, it needs to figure out the empirical study of the structure, conduct and performance of banking sectors in Indonesia in order to know whether this paper supports or not the SCP Hypothesis.

RESEARCH METHOD

This paper used secondary data which are total asset, ROA, CAR, LDR, and ROE. The sources are taken in the form of banks financial statements published by Bank Indonesia and Indonesian banking statistics published by Indonesia financial services authority as well as from annual financial statements of each bank ranging from 2010 to 2019. There are several indicators are used to measure the market structure. It is concentration ratio and Hirschman-Herfindahl Index (HHI). To measure the performance of bank sector, it used the value of Return on Asset (ROA) as profitability indicator.

a. Concentration ratio

Concentration ratio is an indicator used to measure the market structure of an industry which will be described as the number or size of industrial distribution (Tan, 2016). this study used the total asset as the variable and figure out the market structure of four, five, and ten larger banks in Indonesia. Market power will be obtained by industry if there is less competition as the ratio increases (Bello and Isola, 2014). In order to calculate the concentration ratio, it can be accounted by this following:

$$CR = \frac{\text{Total asset of i bank}}{\text{Total asset of whole banks}}$$

There are several measures to determine the market structure of the industry. Due to the fact that this paper used the concentration ratio of the four larger banking industries. Based on some scholars, market structure is generally divided into four market structures, perfect competition (CR4=0), monopolistic competition ($0 < CR4 < 40$), Oligopoly ($40 < CR4 < 60$), and Monopoly ($CR4 > 90$), (Gwin, 2011).

b. Hirschman-Herfindahl Index (HHI)

Hirshman Index (HHI) is measured by squaring the proportion of total assets of each bank in the total assets of all banks. The closer value of HHI to 10.000 indicates that there are fewer companies in charge of the market (Sathye and Sathye, 2004). In general, many regulators use this index to measure market concentration and evaluate mergers. This study used total asset as market share variable.

$$HHI = s1^2 + s2^2 + s3^2 + ... + sn^2 \text{ (where sn is the market share of the ith firm).}$$

Based on the new guideline as issued in 2010 by Department of Justice. The three measures of market classification are: un-concentrated markets with $HHI < 1500$, moderately concentrated markets (with $1500 \leq HHI \leq 2,500$) and highly concentrated markets with $HHI > 2,500$.

c. Regression

Regression is used to know the relationship between dependent variable and independent variable (Beers, 2020). This method has two types that are simple linier regression and multiple linier regression. This paper used the simple linier regression which has each dependent variable (total asset) and independent variable (CR4). The general form of each type of regression is:

Simple linear regression: $Y = a + bX + u$, and

Multiple linear regression: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + ... + b_tX_t + u$

Where:

Y = the variable that you are trying to predict (dependent variable).
X = the variable that you are using to predict Y (independent variable).
a = the intercept.
b = the slope.
u = the regression residual.

This study used the Ordinary Least Squares Regression (OLS) method corresponds between the observed and predicted values to minimize the sum of square errors (Zdaniuk, 2014). This paper also used panel data (the first large banks of Indonesia).

RESULT AND DISCUSSION
Result

Based on the results **Table 3.** it shows that concentrated ratio of 10 larger banking industries decreases while that of four and five larger banking sectors increases for the last 10 years. The graph above shows that there was an increase in 4 to 5 of the biggest banks in Indonesia. This can be seen from the ratio value from 47.43% and 52.20% in 2010 to 62.55% and 55.75% in 2020. It indicates that over the past 10 years, the fourth to fifth of the largest banks in Indonesia experienced an increase in market concentration. This increase is likely due to the reduction in the number of banks in Indonesia by 10 banks, of which there were 122 banks in 2010 and 110 banks left in 2019. This also affected the level of competition that began to decline. To be more detail in concentration ratio of the first four large banks, it is concluded that the banking sector in Indonesia is oligopoly in which the CR4 is exceed 40 % and no more than 60%.

Tabel 3. Concentration Ratio of Indonesian Banking Industries

YEAR	CR4	CR5	CR10
2010	47.43	52.20	69.08
2011	46.61	51.18	66.30
2012	46.06	50.69	66.26
2013	45.26	49.67	64.13
2014	46.77	50.92	65.85
2015	47.43	51.35	66.39
2016	49.36	52.95	66.39
2017	50.24	53.85	66.81
2018	52.22	55.59	68.39
2019	62.55	55.75	67.74
Mean	**49.39**	**52.42**	**66.73**

As we can see in **Figure 1.** it shows an increase in the value of market concentration which increased during the last 10 years even though several years continued to experience a decline. In 2010, the value of HHI showed a total of 2249 and continued to decline until 2013 to amount to 2048. Then in 2015 to 2019, the value of HHI continued to increase by 713 which in 2014 amounted to 2187 to 2751 in 2019. It is that the market concentration of the first four larger banks in Indonesia has a highly concentrated in which the HHI value is greater than 2500.
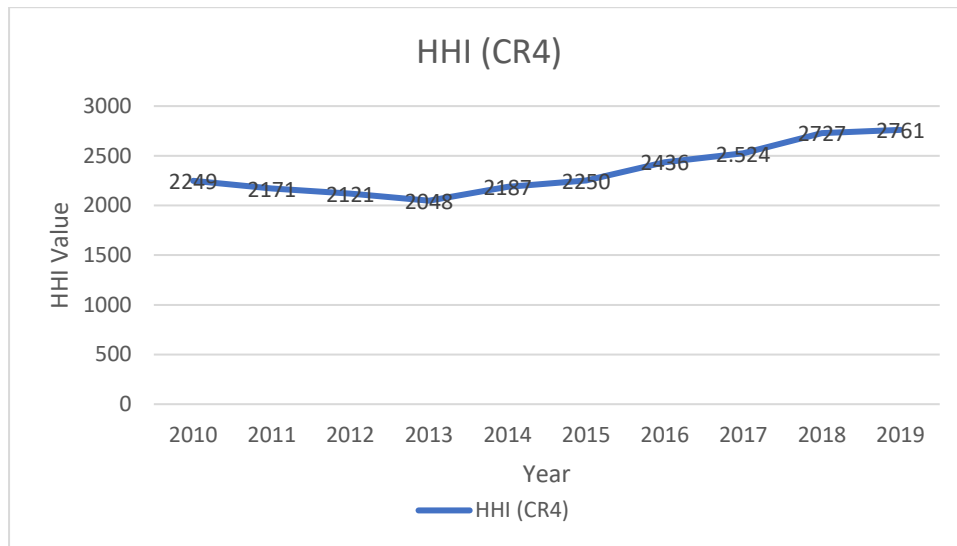
Figure 1. Hirschman-Herfindahl Index (HHI) of the first four Indonesian Banking Industries
Source: data processed by the author

The data from **Table 4.** can be seen that of the four banks having the highest assets, BRI is one of the banks that has the highest return on assets even though for 10 years it has decreased ROA growth. From this figure, it is explained that the maximum ROA value of BRI banks is 5.15% in 2012 and the minimum value is 3.50% in 2019. The decrease is still above the ROA value of independent banks that have the highest average assets, which in 2019 reached 3.03 percent after experiencing a decrease of 3.55 percent in 2012. While in 2012, BCA banks experienced a decline in ROA growth of 0.2% but after that, BCA banks continued to increase until 2019 reaching one-twenty-five percent.

Amid the ups and downs of the three banks, for 10 years BNI has been able to keep its return on assets at two percent, although during that time the value has also diminished but is not too significant. Since it found that BNI has the smallest product offering compared to the three largest Indonesian banks.

Table 4. ROA of the four larger banks

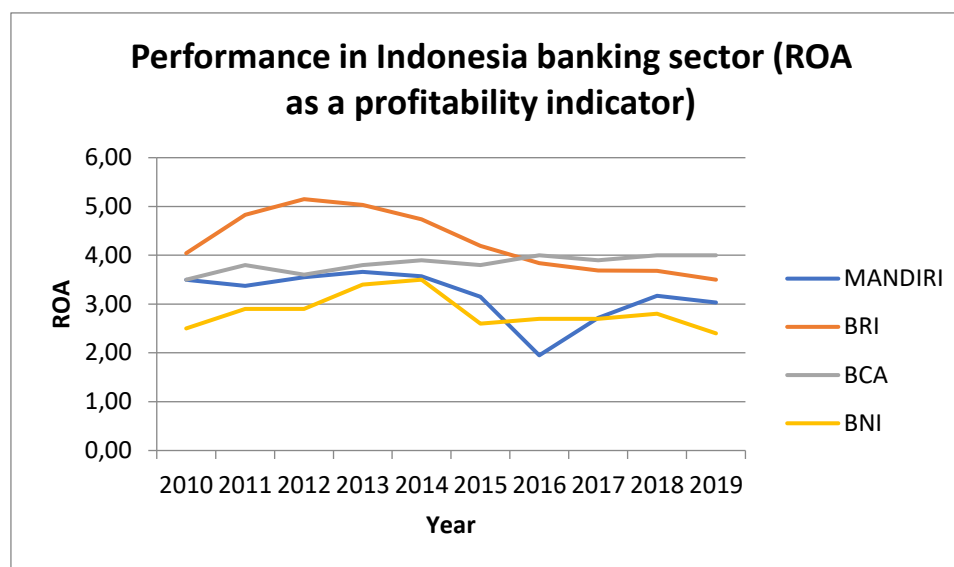| Year	MANDIRI	BRI	BCA	BNI
2010	3.50	4.04	3.50	2.50
2011	3.37	4.83	3.80	2.90
2012	3.55	5.15	3.60	2.90
2013	3.66	5.03	3.80	3.40
2014	3.57	4.74	3.90	3.50
2015	3.15	4.19	3.80	2.60
2016	1.95	3.84	4.00	2.70
2017	2.72	3.69	3.90	2.70
2018	3.17	3.68	4.00	2.80
2019	3.03	3.50	4.00	2.40

Figure 2. ROA of the four larger banks
Source: data processed by the author

The linkage of market structure and profit indicates that there is negative relationship of them. Based on the regression of four larger banks for ten years, we gain the specification model
$Y = a + bX + u$, that is
$Y = 693608.8 - 28885.875\ X + u$.
It shows **Table 5.** that the coefficient of CR4 is negative 28885.875 meaning that if 1 percent of CR4 increases, it will go down the total asset as much as 28885.875. While, if the CR4 remains constant, the total asset will be 693608.8 billion rupiah. This implies that banks of Indonesia will earn more profit if the concentration ratio reduces.

Table 5. Regression Result using OLS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	693608.8	63458.15	10.93018	0.0000
CR4	-2885.875	7200.323	-0.400798	0.6908

Discussion

Analysis result shows that the structure of Indonesian commercial bank is oligopoly market. It indicates that some banking institutions in Indonesia dominate the market where those businesses have a huge power to lead the market share affecting each other because another company will be affected by the other decision and actions (Pertiwi, 2013). Also, the top banking sector in Indonesia can influence the price and interest rate of all banking industries in Indonesia. The slow rate of interest is contributed by the high interest in distribution of funds because many entrepreneurs have no desire applying the credit. Further, it causes the rill sector unable to encourage its role in economic development. This result supports findings by Dianitasari and Hersugondo, (2020) as well as (Pertiwi, 2013).

The huge market structure of banking in Indonesia shows that Indonesian commercial banks have a high concentrated. It is line with the analysis result using HHI that shows Indonesia banking sectors has relatively increased for the last decades. It has potential to level up the stability of commercial banking in Indonesia. It means through applying the Indonesian Banking Architecture (API) succeed recovering Indonesian banking sector after tribble financial crises (Yudaruddin, 2014).

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The author also concluded that the high concentrated banking sector will increase the performance bank.

The increase in performance might be because of their ability to gain more profit through various products offers. Nisa et al., (2019) concluded that ROA variable is appropriate in explaining banking performance. This performance is influenced by the differential products that they offer for attracting their customer in order to win the market. As it can be seen, Mandiri bank has the best performance compared to the others because Mandiri bank has increase ROA during the last decade as well as more than 13 types of credit offers encouraging the huge profit can be gained. On the contrary, BNI is the bad performance compared to the three largest banks in Indonesia. it is because BNI has not many products of credits can be offered for the customers. Since it is commercial government banks which only has a half of credits offers of Mandiri Bank, BNI focuses on differentiating the saving products. Naylah, (2010) emphasize that the different profitable degree every bank shows the competitiveness and different healthiness each bank.

Analysis result of relationship between structure and profit is founded negative. The bigger market structure of Indonesian banking industries, the less profit will be gained. Naylah, (2010) described that market share and concentration is elements of market structure that proved significantly towards profitability, without those two element and performance, profitability of banking industries in Indonesia is negative. Healthy banks can operate their operation efficiently which cause the good performance through the stable and high value of ROA. During the observed period, macroeconomics and unstable world finance influence the fluctuation of the rise of stable profitability rate in Indonesia banking industries.

CONCLUSION

To sum up this paper, there some conclusion that can be concluded through the analysis which has conducted. Firstly, the level of structure in the four large banks in Indonesia is relatively high concentrated. It is proved by the value of HHI is greater than 2500. Secondly, the four banking sectors in Indonesia is indicated as Oligopoly market due to the fact that its value of Concentration Ratio is between 40% and no more than 60%. The four large Indonesian banks go down the competition rate owing to the reducing of the number of banks. Of the first four large banks, BCA has the highest return on asset even though the largest total asset has been had by Mandiri Bank. Lastly, the four large of Indonesian bank industry elaborate that the negative relationship between profit and structure. it is seen from the value of coefficient on CR4 is negative 28885.875.

Based on the result above, it is strongly suggested the entities of banking industries in Indonesia to run their operation efficiently in order to gain more profit. Have a good performance is essential to create the less concentrated market, so that the high interest rate can be avoided which aims to enhance stability of economy in Indonesia. The tight control policy should be created by government in maintaining health of banking industries in Indonesia. It leads to push the community losses down through preventing the coalition activities in oligopoly market.

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