

# The Impact of Banking Architecture Policy and Macroeconomic Condition on Indonesian Banking Concentration and Market Structure

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## The Impact of Banking Architecture Policy and Macroeconomic Condition on Indonesian Banking Concentration and Market Structure

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### ABSTRACT

This research discusses the concentration, market structure, and factors affecting the market structure of banking industry in Indonesia. The purpose of the study is to examine and analyze the impact of IBA Policies and macroeconomic conditions on the market structure of banking industry. Analytical techniques use concentration ratios and panel data regression models to analyze the determinants of the market structure of the banking industry. The market structure is measured by the ratio of banking asset concentration. Data used in this study are from 2004 until 2015. Bank balance sheets data of 109 conventional banks published by Bank Indonesia and the Financial Services Authority. Data on economic growth and inflation were published by the Central Bureau of Statistics. Based on the ratio of CR4 and CR8 concentration, it is found that the Indonesian banking market structure is monopolistic competition. Market structure is effectively and significantly influenced by banking regulatory factors, IBA consolidation policies, behavior and performance, bank size, market share, cost efficiency, inflation and economic growth.

**Keywords:** Consolidation, Banking Concentration, Monopolistic Competition, Macroeconomic Conditions

**JEL Classifications:** E52, E58, L1, L8

### 1. INTRODUCTION

The banking liberalization began the regulatory framework of the Indonesian banking system since the 1980s. Bank Indonesia enacted a package of banking deregulation by limiting legal lending credit and giving privilege to the bank to set its own interest rate. In 1993, central bank loosed prudent banking principle, but the policy appeared moral hazard problems i.e., proportion of lending was concentrated priority sectors (usually state enterprises). According to Ghosal and Miller (2003), consequently of moral hazard could lead to bank bankruptcy.

Deregulation by liberalizing banks was not strong enough for banks to prevent the crisis. The economic crisis began in early July 1997, started from the exchange rate volatility. At the same time, the government tightened liquidity, which led to a crisis of public confidence in the national banking system, especially after

the revocation of 16 banks' licenses on November 1, 1997. The weakness of governance and banking supervision triggered the economic crisis.

The crisis effect on Indonesian economy crash and forced the government to issue a policy of banking recapitulation. The government through the Indonesian bank restructuring agency (BPPN), established in January 1998 that conducting banking restructuring by including capital, resolving asset problems and attempting to refinance the already-fledged banking sector. BPPN in conducting bank recapitulation and banking restructuring programs accompanied by the liquidation of 16 banks and encouraging 14 banks to merge, bringing the number of banks in 2000–151 banks. The banking regulation program ended in 2004 and succeeded in reducing the number of banks to 133 banks.

Afterwards, Bank Indonesia as the central bank continued bank restructuring program that has been running with the consolidation policy known as the Indonesian Banking Architecture Policies (IBA) as known it is Arsitektur Perbankan Indonesia (API) in 2004. The launching of IBA is not come off from the efforts of Government and Bank Indonesia to conduct banking consolidation that help Indonesian economy recovery after 1997/1998 crisis. As a necessary for a blueprint of national banking, Bank Indonesia has launched IBA as a comprehensive policy framework regarding the direction of Indonesian development banking industry in the future (Bank Indonesia, 2004). IBA policy is aimed to encourage healthy and efficient banking system and economies of scale. Banks with large assets enable to achieve efficiency and economies of scale.

According to the vision of IBA 2004, the government plans to reduce the number of banks to about 60 units, consisting of 2-3 international banks, 3-5 national banks and 30-50 specialist banks (Bank Indonesia, 2010). The IBA consolidation policy has continually led to mergers and acquisitions bank. Consequently, the number of banks is currently reduced from 133 in 2004 to 120 banks in 2015.

The IBA policy has encouraged banks to increase their capital either from paid-in capital, disclosed capital from existing capital, consolidation and merger, acquisition of large banks, or additional capital that can be obtained through the capital market. Since 2015 the number of the public bank amounted 42 public banks and 19 units of consolidated and merged banks. The merged bank resulted from the consolidation of IBA was 11 banks. Similarly, there are 19 banks entering the capital market in 2006-2015.

The consolidation policy was reinforced by Bank Indonesia Regulation, namely PBI No.9/16/PBI/2007 concerning incentives for banking consolidation. In addition, the government through the Ministry of Finance support the realization of merger banks by issuing the Minister of Finance Regulation no. 43/PMK.03/2008 that concerns the use of book value of asset transfer in the framework of merger, consolidation or expansion of the business. Moreover, they facilitate margin banks by allowing the use of book value in asset transfer to the merged bank.

The IBA scheme is also supported by some policies in Bank Indonesia Regulation (PBI). Two regulations directly affect the banking structure, namely Bank Indonesia Regulation No. 10/15/PBI/2008 about regulating minimum capital adequacy ratio (minimum CAR 8-14%) and Bank Indonesia Regulation No.8/16/PBI/2006 about regarding single presence policy. The impact of these policies is believed to reduce the number of banks so that the concentration of industry will be higher and will affect the level of bank competitions. The impact of consolidation policy will increase capital in the bank. Thus, we will examine whether it affects the market structure of banking industry or not. Moreover, whether macroeconomic conditions such as economic growth and inflation will affect the concentration of banking industry in Indonesia or not.

## 2. LITERATURE REVIEW

The literature related to concentration and monopoly problems has been discussed by Mason (1957). Mason wrote a book that the title is "economic concentration and the monopoly problem." Mason is known as a pioneer in the study of market structure, conduct and performance of industry (SCP) since the 1930s. The study of SCP was followed by Bain (Mason's student) in 1959 writing a book entitled "Industrial Organization" (Hasibuan, 1993).

In the early phases, SCP's paradigm developed by Bain in 1951 has been applied to the US processing industry (Sarita, 2012). Then, the SCP paradigm began to be applied to the banking industry to know the correlation between market structure and bank performance. Further research on several merger banks in America had an impact on concentration because the dominant bank had a large market share (MS) and potentially increased its profitability (Gilbert, 1984).

A study related to SCP conducted by Caves (1967) found that the higher concentration of the market in the banking industry would obstruct the new competitors to the entry in the Industrial market. The increasing of market concentration will affect bank behavior by making the collusive action, to pricing so that the banks involved in this agreement will be able to improve their performance. Rhoades (1982) and Hannan (1991) argued that there is a positive relationship between market structure and performance. It is consistent that oligopoly industry made an agreement (collusion) in price and output determination. According to Demsetz (1973), the source of concentration is efficiency rather than market power. Efficiency may occur because companies work hard with their own management efforts without colluding.

According to the SCP tradition, as expressed by Mason (1939), it assumes that the level of market concentration drives companies to increase prices. Thus, when prices increase more than marginal costs, it is considered an inefficient condition. In contrast, Shaffer (1994) says lower prices are not a good indicator for measuring market efficiency. Shaffer explained that greater efficiency among large enterprises in a competitive market tends to push lower prices (Mulyaningsih and Anne, 2011).

The paradigm of SCP banking evolved along with the advancement of information technology and the role of government policy in regulating banking. Neuberger (1997) adjusts the basic conditions in the SCP paradigm to the conditions of the banking industry, incorporating public policy frameworks including protection rules, prudential principles, and competition policy. In the recent SCP paradigm of the banking industry, all variables are endogenous due to the dependence of market structure variables, behavior, and performance. The feedback effects on basic conditions and public policy are stated by Gilbert (1984), Gelos and dam Roldos (2002) and Sahoo and Mishra (2012).

Rajan and Zingales (1998) found that the development of the financial sector is more important for industries that rely on financing sources from the financial sector such as banking. The development of banking sector performance depends on

macroeconomic conditions. Some researchers have involved macro variables in assessing the performance of bank profitability such as Demirgüç-Kunt and Huizinga (1999), Athanasoglou et al. (2005), Sastro and Suzuki (2012), and Owoputi et al. (2014). Their findings show that economic growth and GDP-per-capita growth are positively related to bank profitability performance.

High inflation will exacerbate economic conditions and will have a significant impact on the crisis (Demirgüç-Kunt and Levine, 2001). In line with Zaleski (1992) and Beck et al. (2006) with data from 60 countries in 1980–1997, they argue that concentrations contrary to the initial hypothesis that could cause a crisis. The tendency has the possibility to mitigate systemic banking crisis. This result is due to the control of macroeconomic conditions, policies and good institutional factors. Real GDP growth also negatively affects the economic crisis which higher growth will reduce the possibility of a crisis.

The market structure can be determined from the concentration of the largest banks in the market. The concentration level can be measured by concentration ratio towards used output and input. Our research will use concentration ratio of 4 largest banks (CR4) and 8 largest banks (CR8). The interpretation of the market structure based on the concentration ratio is adapted from various sources such as Bain (1951), Shepherd and Shepherd (2004), Carlton and Perloff (1994) and etc. The size of concentration is proxied by the number of bank assets. While MS is proxied by lending (MS). MS reflects the contribution of each bank in the credit fund market. The loan to deposit ratio (LDR) is measured by comparing the total of credit and third-party-funds including demand deposits, savings deposits, and all deposits.

The consolidation policy to strengthen the national banking is continuously conducted by IBA scheme. The IBA scheme is also supported by some PBI regulation. Two regulations directly affect the banking structure, namely Bank Indonesia Regulation 3 p. 10/15/PBI/2008 about regulating minimum CAR 8–14% and Bank Indonesia Regulation No. 8/16/PBI/2006 about regarding single presence policy. The impact of these policies is believed to reduce the number of banks so that the concentration of industry will be higher and will affect the level of bank competitions. Banks are allowed to acquire or merge with a maximum ownership or controlling requirement of 20%.

Shaffer (1994) showed that in the United States between 1985 and 1991 there are more than 4000 commercial banks merged from consolidation policies. It was feared by the government to increase concentration and increase anti-competitive monopoly power. The laws of about anti-monopoly in America can prevent this behavior. Gelos and dam Roldos (2002) which reviewed consolidation in emerging market countries (Latin America, Asia, and Central Europe) concluded that consolidation policy is driven by a market with the increasing role of foreign banks to reduce the intensity of competition and increased concentration.

In contrast, Gelos and Roldos (2002) support Shaffer (1994) findings, Mulyaningsih and Anne (2011) studies on the impact of bank consolidation in Indonesia. They concluded that consolidation

policies in Indonesia decreased the concentration like in the other Asian countries. Since the Bank Indonesia Regulation concerning the single presence policy is enacted, individuals or groups may only own a controlling share of a maximum of 20%. Under the IBA policy until December 2010, the bank must have a minimum capital of Rp 100 billion. This provision encourages banks to conduct mergers, acquisitions or holding companies to meet the requirements of single presence and minimum capital adequacy requirements (CAR). The Merger can be applied by banks with the provision of merged bank asset share does not exceed 20% of the total assets of all banks. The two policies allegedly resulted in reducing the number of banks and enlarging bank group assets. The implications can reduce the intensity of the level of competition. Concentration and MS will be distributed between large and small banks. This condition may affect the changing structure of the banking industry. The concentration is not always bad because concentration can reduce the risk of a systemic banking crisis (Beck et al., 2006). If the bank performance is supported by efficiency rather than collusion.

In the case of the banking industry, concentration can be measured by operating income, profit levels, capital, and bank assets. More broadly, bank assets reflect the size of the bank's strength. Sources of bank assets from their own capital, loan capital, residuals for profit, demand deposits at central banks and funds in third parties either in the form of deposits or credit. The banking industry requirements with the need to increase its capital and assets to achieve business scale.

More capital and asset allow banks to sustain businesses and risks and to have the opportunity to develop technology, human resource development and to increase lending capacity. A large growing bank will be able to increase efficiency and MS. Large banks are better able to increase their power in the market through raising fund and lending so that it will be able to increase revenues and profits. Banks to increase revenues and profits faced with operating costs include capital costs, labor costs, administration, and promotion. Banks that have capable operating well will earn non-operating revenues such as rent income, gains on the sale of fixed assets, foreign exchange differences, bank credit offsetting of interbank offices and interbank money market interest (PUAB). The higher sales of operational and non-operational activities are better able to increase its capital and assets. Assets may be the size of bank and concentration ratio as a measure of market structure.

### 3. RESEARCH MODELS

This study used data 109 of Indonesian directory banking to analysis the determine factors that affecting the banking market structure. The market structure can be measured by using the concentration level of several variables namely; value added or profit (Carlton and Perloff, 1994), the amount of labor, capital, sales, or asset (wealth) variable. The scope of this study will analyze the asset concentrations of four largest banks and 8 largest banks to determine the structure.

Formulation of market structure is using asset concentration ratio. If the bank share assets is denoted  $S_1$  for the first bank,  $S_2$  for the

second bank, then the concentration of  $m$  the largest bank can be expressed as follows (Kuncoro, 2007; Rodrigues et al., 2015);

$$CR_m = \sum_{i=1}^m S_i = S_1 + S_2 + \dots + S_m \quad (1)$$

Where,  $CR_m$  is the largest asset concentration- $i$  to  $m$ ,  $S_i$  is the largest asset share of bank- $i$  to  $m$ . Equation (1) most widely used is the top four (CR4) and top eight (CR8) bank MS asset. The value of  $CR_m$  is minimum 0% and maximum are 100%. A value close to 0 implies minimum industry concentration and value approaching 100 shows maximum concentration. Rodrigues et al. (2015) divided into three concentration; First, low concentration if a concentration ratio of 0–50%. Monopolistic competition falls into the bottom of this. Second, medium concentration if a concentration ratio of 50–80%. These industries are very much oligopoly. Third, high concentration, if a concentration ratio of 80–100% is viewed as highly concentrated. In that cases, government regulators are usually most concerned with industries falling in this category.

This study uses concentration measures to classify market structures as proposed by Bain (1951), Carlton and Perloff (1994), Shepherd and Shepherd (2004), and Gwin (2000) and Rodrigues et al. (2015). In line with the study, we used proposed a market-based interpretation based on the grouping of banking concentrations. Classification of concentrations and market structure as follows; First, high concentrations if CR4 ranges from 0.72 to 0.99 and CR8 ranges from 0.88 to 0.99 can be classified oligopoly market with dominant firm, where the largest companies have large market forces with a high barrier to entry. Secondly, if CR4 ranges from 0.61 to 0.71 and CR8 range from 0.77 to 0.87 then its market structure is classified as tight oligopoly or conjectural oligopoly, where the market leader has a barrier to entry, and the small company follows the lead in the market. Third, loose oligopoly category if the concentration of CR4 ranges from 0.56 to 0.60 and CR8 ranges from 0.70 to 0.76. The MS of some companies is quite large but small competitors compete freely taking the rest of the existing market segment. Fourth, if CR4 ranges from 0.30 to 0.55 and CR8 ranges from 0.40 to 0.69 is a monopolistic competition market. Some companies have a relatively high MS, but more companies have a small MS and low barrier to entry. Fifth, CR4 concentrations ranging from 0.05 to 0.29 and CR8 ranging from 0.10 to 0.39 can then be classified into effective competition structures, where all firms can compete, small market forces and in and out barriers the market is very low. Sixth, the category of pure competition or perfect competition if the CR4 number ranges from 0 to <0.05 and CR8 is 0 to <0.10. In this pure competition market, all companies are small in scale and can compete without any market barriers.

The focus of the market structure measurement in this study used the ratio of the four largest banks (CR4). But to see the possibility of other variations, the structure will also be equipped with the size of the eight largest banks (CR8) as the interpretation of the market structure.

The structure of banking industry has a major indicator of market concentration and some determinant variables that influence the

level of concentration stated by Sahoo and Mishra (2012). The high concentration is influenced by banking policy variables such as capital adequacy, liquidity, and banking architecture policy (DIBA), bank size (BSZ), MS, peripheral intensity, cost efficiency, banking profit, economic growth and inflation rate. Based on the determinant of the structure, the model of banking industry structure can be formulated as follows;

$$CR_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LDR_{it} + \beta_3 DIBA_{it} + \beta_4 OBCT_{it} + \beta_5 BSZ_{it} + \beta_6 MS_{it} + \beta_7 ADVI_{it} + \beta_8 COEF_{it} + \beta_9 ROE_{it} + \beta_{10} GDP_{it} + \beta_{11} INF_{it} + \epsilon_{it}$$

Where;

$\beta_i$  = Coefficient of regression;  $\beta_{1,2,3,5,7} > 0$ ;  $\beta_{4,6,8,9,10} < 0$

$CR_{it}$  = Concentration ratio

$CAR_{it}$  = Capital adequacy ratio

$LDR_{it}$  = Loan to deposits ratio

$DIBA_{it}$  = Consolidation policy of IBA (Dummy 2004–2015=1)

OBC = Office Banking Channeling

$BSZ_{it}$  = Bank size

$MS_{it}$  = Market share

$ADVI_{it}$  = Advertisement calculated advertisement cost ratio with the total expenditures

$COEF_{it}$  = Cost efficiency

$ROE_{it}$  = Profitability

$GDP_{it}$  = Real GDP growth

$INF_{it}$  = Inflation rate

$i$  = Bank

$t$  = Years.

## 4. RESULT AND DISCUSSION

### 4.1. Market Structure

As a result of the liberalization and deregulation of banks, there has been a change in the level of bank competition through changes in the banking structure (Mulyaningsih and Anne, 2011). The process of consolidating and restructuring the banking industry structure is going well. The development of the banking financial performance is quite stable so as to be able to face the global crisis in 2008. The development of banking industry is reflected in bank assets and loans disbursed. The total assets of commercial banks until 2015 reached IDR 5919 trillion and credit reached IDR 3477 trillion supported by the progress of banking services. The extent of banking services is measured by the number of offices continuing to increase. In 2004 the number of offices was 7939 or 233 offices per province. By 2015 the number of offices has steadily increased to 32,783 offices or 933 bank offices per province. An increase in the number of bank offices per province reflects an increasing office bank coverage. The increasing number of offices and bank services means that more people are able to be served by banks so that economic activity will work. The bank office coverage services in each province will encourage fund-raising and fund-channeling activities, so that business needs and development activities can be fulfilled.

The target of IBA consolidation policy from bank capital aspect has been reached until 2013, but in terms of a number of banks to reduce the number of banks to about 60 banks is still difficult to achieve because it will bring up various problems in the

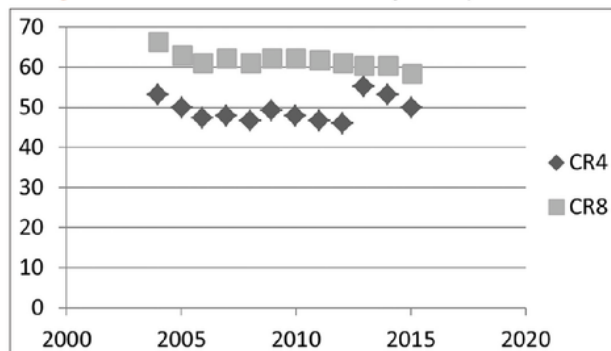
consolidation process with the merger or the establishment of a holding company. Expectations of the IBA is certainly to bring the consequences some banks must be merged or form a holding company. For state-owned banks or BPD banks if the merger is feared will increase the concentration in the industry. In addition, each bank will lose its business focus and consumer segmentation that has been well established. For example, Bank BRIs focuses rural and agriculture that will lose orientation if they have to be merged with Bank Mandiri whose orientation is to intermediate large corporation funds at national and international scale, and vice versa. BNI segmented middle class, and BTN segmented property sector will lose its trademark if it must be in the merger. Another consequence of the IBA policy, the consequence of increased competition of large banks with small banks, or inter-bank cooperation, for example in inter-bank ATM access and syndicated inter-bank credit (Sugema, 2005, in Kusumastuti, 2008).

<sup>2</sup> The market structure of the banking industry is measured by concentration ratio of the largest bank assets by using CR4 and CR8 in 2003–2015 as specially using Equation (1) found that the market structure of the banking industry in Indonesia is monopolistic competition. The banking concentration level of 2004–2015 is shown in Figure 1.

In 2003, the concentration scale of four largest banks was 55.37 and the value of CR4 was 53.16 in 2004. Since 2005–2015 CR4 values below 50%, CR4 in 2015 only about 49.6%. While the CR8 size decline in 2005 i.e. the previous concentration number of 68.40 in 2003 decreased to 62.71. The decrease in CR8 concentration is not as crucial as CR4. The declining in concentration ratio is due to the consolidation policy encouraged by Bank Indonesia through the 2004 IBA scheme. This finding is in line with Daryanto and Priyarsono (2011) and Mulyaningsih and Anne (2011). They concluded that the competition of bank level as measured by H-statistics (total factor elasticity) decreased after IBA consolidation policy (1999–2009 and 2004–2009). At the same time, concentration ratio (CR4 and CR8) also decreased.

Since 2004, banks have consolidated, merged and acquired to fill up single presence policy and minimum capital requirement. Based on Bank Indonesia Regulation Number: 10/15/PBI/2005 minimum capital should reach Rp 100 billion per December 31, 2010.

Figure 1: Concentration Ratio of Banking Industry in Indonesia



Sources: DPI, Bank Indonesia and OJK, 2004–2015

Mergers and acquisitions banking clearly lowered the number of banks. This smaller number of banks will lower or higher the concentration of the banking industry.

The banking consolidation resulted in a decrease in the number of banks, from before the IBA amounted to 136 banks. From 2000 to 2015 there were 15 banks that exited. In 2004 until 2014 the number of commercial banks amounted to 120 banks consisting of 109 conventional commercial banks and 11 sharia banks. In 2014, there is an additional one sharia bank, while conventional banks are stable in 109 banks. After mid-2015, there were 108 conventional banks and 12 sharia banks.

A more complete description of market structure and market power of the four largest banks in the banking industry is shown in Figure 1. The fluctuations in market concentration occurs in line with fluctuations in MS of funds and credit markets. In 2008, the concentration ratio of four banks decreased compared to the previous year, which was 46.68 and the MS of DPK and credit share also decreased compared to the previous year. It seems to be associated with economic growth and inflation. In 2008 the inflation rate was 11.06% and economic growth was 6.01%.

In 2009, inflation fell to 2.278 and economic growth decline 4.63%. Conducive macroeconomic conditions are able to encourage banks to improve their performance indicators. The MS of DPK rose to 50.98%, and so did the share of credit rose to 45.29%. Consequently, the concentration ratio increased to 48.81%.

#### 4.2. The Determinant of Market Structure on Industrial Banking

The model in this study is examined using panel data regression. Based on chow-test of 5.62 with probability 0.00, and redundant fixed effect test of 519.8, the appropriate model is a fixed effect. Hausman test probability = 0.000 < 0.05, ho rejected, then the proper fixed model. The estimation result of fixed effect model and statistical test give the best model.

The model of market structure can be presented in Equation (3).

$$CR = 83.2296 - 0.0019 CAR - 0.0047 LDR - 4.7546 DIBA$$

$$+ 1.8817 MS_{FUND} - 0.0237 OBC - 3.8609 BSZ + 0.8671 MS + 0.0166 ADVI$$

$$- 0.0193 COEF + 0.0081 ROE - 0.9842 GDPR + 0.1201 INF$$

$$(0.005)^{***} (0.1411)^{***} (0.1434)^{***} (0.006)^{***}$$

$$(0.004)^{***} (0.0029)^{***} (0.074)^{***} (0.120)^{***}$$

$$R^2 = 0.511; \text{ Adjusted } R^2 = 0.462$$

$$F\text{-statistic} = 10.34 \text{ Prob. } F\text{-test} = 0.000$$

$$DW \text{ test} = 1.68$$

$$\text{Level of significant t-test: } ***(\alpha = 1\%).$$

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Based on the coefficient of determination ( $R^2$ ) of 0.511, all independent variables in the market structure model able to explain the variation of the market structure about 55.1%. The F-statistic value is 361,3391 and Probability  $F = 0.000$ . the probability of t-test is significant at  $\alpha = 1\%$ . All independent variables significantly influence the market structure. The constant of 83.23 means that if all independent variables are constant or zero value (without the central bank and controls), the banking industry will be highly concentrated towards the tight oligopoly. However, if all micro banking variables change by including banking policy, the banking market structure will be within the monopolistic competition market with an average CR of 47.61%.

The simultaneous system estimation results show that all independent variables have a significant effect on toward the market structure. Variables of bank policy (CAR, LDR), IBA policy, behavioral variable (ADVI), performance (ROE) and structural elements (BSZ, MS), behavioral elements (DM), and performance elements (COEF) and macro conditions significantly affect the industrial banking structure.

The achievement of CAR in the banking sector is 31.82% above the minimum CAR (14–18%). The effect of CAR is significantly lower market concentration by the coefficient of  $-0.0019$ . Liquidity policy through the regulation of average LDR 85.60 was also able to reduce the concentration about  $-0.0047$ . The two banking policies effectively decrease the market concentration of banking industry. The role of Indonesia's case consolidation policy is similar to a consolidated banking policy in Malawi (Chirwa, 2001) which effectively affects the market structure.

The role of bank consolidation policy regulated through the IBA is shown by the IBA coefficient of  $-4.754$  and significant at  $\alpha = 1\%$ , which means the consolidation policy significantly more influence on the increase of concentration than without IBA policy. IBA consolidation is able to push the increasing concentration. IBA policies provide opportunities for banks to consolidate, merge, acquisitions, and increase competition to gain additional capital, assets, and CAR in the market. The IBA policy pursued by encouraging banks to merge can actually increase concentration and bad competitive climate. To some extent, the consolidation effect with mergers will redistribute market forces. The consolidation policy through IBA is very effective in lowering market concentration. the IBA is encouraged to consolidate and merge, acquisitions and form a holding company, which ultimately strengthens capital and assets in the bank. However, the consolidation was constrained by a single presence policy in which the controlling share did not exceed 20%. The capital or asset of the merged bank and the acquisition of its share must not exceed 20% in the industry. Single presence policies are effective in maintaining market concentration or monopolistic competition market structure.

Market structure elements such as BSZ and MS significantly affect to the market structure at  $\alpha = 1\%$ . The BSZ coefficient is about  $-3.8609$  the increasing BSZ of or the logarithm of banking assets will decrease market concentration. If all the simultaneous asset banks increased 1%, the market concentration would drop

by about 3.86%. In contrast to MS indicates that the increase of 1% MS will increase market concentration about 0.9671%. The larger MS will make strong position in the market encouraging increased concentration. The greater market share also shows the ability of the bank to compete with other banks.

Behavioral factors contained in the model structure (3) is the intensity of advertising and mergers by banks. The ADVI coefficient is significant at  $\alpha = 1\%$  about 0.0166 indicating that the 1% to increasing the intensity of advertising will significantly increase 0.0166% concentration ratio. Furthermore, advertising will be able to encourage the increase of market concentration. The rising ratio of operating costs and operating income (COEF) shows that bank operations are becoming less efficient. The more inefficient operational activity of the bank or the higher COEF significantly decreases the concentration. The COEF coefficient of  $-0.0193$  indicates that operational inefficiency of the bank will reduce the concentration of the banking industry. The more inefficient activities are lower the ability of banks to earn income. Thus, the impact of banking assets will decline concentration ratio.

The effect of the Office Bank Scope (Office Banking Channeling) is significant at  $\alpha = 1\%$ , with a coefficient about 0.0237 indicating that more office or the wider range of banking services will lower the concentration of the banking market. The increasing number of branches and the scope of services will encourage the increase of bank assets. The Increasing assets of small banks will increase its assets and its role in the industry, so the concentration of banking industry will decrease.

Performance factors included in the model (3) are profitability performance (ROE) and bank operating cost efficiency (COEF). The ROE coefficient is significant at level  $\alpha = 5\%$ . The increasing of 1% banking profitability will significantly increase 0.0081% concentration. The performance will be able to encourage increased market concentration in line with the study of Sahoo and Mishra (2012). The cost efficiency coefficient (COEF) is significant at the level of  $\alpha = 1\%$ . So, the increasing of COEF is more inefficient to reduce concentration about 0.0193%.

Market structure elements such as BSZ and MS are significant at  $\alpha = 1\%$ . The BSZ coefficient of  $-3.8609$  means that increasing the size of the bank or the logarithm of banking assets, it will decrease market concentration. If all the simultaneous banks of assets increased 1% then the market concentration would drop by about 3.86%. In contrast to MS with MS coefficient of 0.9671 indicates that a 1% MS increase will increase the market concentration of 0.9671%. The larger MS will make the banking position in the market stronger, thus encouraging increased concentration. The greater the market share also shows the bank is able to compete with other banks.

The effect of inflation on market structure is also significant at  $\alpha = 1\%$ . A 1% increase in inflation will lead to a rise in the concentration of 0.120%. Banks are able to adjust the inflation rise into the business planning process. Banks are able to anticipate inflation by more quickly adjusting interest rate increases, as well as trying to increase the acceptance of operations and other

non-operations. A stable and low inflation rate will benefit the bank for profit, additional capital and profits that ultimately increase bank assets. These are the factors that can explain the positive relationship between inflation and concentration.

In contrast to inflation, the increase of a percent real economic growth will decrease concentration. An increase in economic growth will boost the ability of banking to raise funds and extend credit. This finding is in line with the results of Athanasoglou et al. (2005) studies where increased economic growth will benefit the banking business, increases income, the difference between interbank lending rates increases, administrative fees also increase, and bad debts or losses on earning assets are smaller. Finally, banking assets and capital increase. If all banks are able to obtain as it has been described, all assets and capital of the entire industry will increase. Finally, the concentration of the bank will be distributed, so that the effect of the increase in economic growth can reduce the concentration and market structure becomes more competitive.

## 5. CONCLUSION

The process of consolidating and restructuring the Indonesian industrial banking structure has resulted in quite a good achievement. The development of financial banking performance was relatively stable as evidenced by the resilience to face the turmoil of the global financial crisis. Although the number of banks decreased due to the merger in order to fulfill the single presence policy, a number of network bank deposit increase continually. The minimum capital requirement of commercial banks amounting to IDR 100 billion by the end of 2010 is mainly met by increasing capital, selling shares, an or acquisitions by investors. In the ownership aspect of the bank, domestic parties in Indonesia are still larger than foreign ownership. Foreign ownership also continues to increase portions, including in mixed banks. The banking industry is still able to increase its lending with an adequate level of profitability, so the bank still has a share in encouraging economic growth. The impact of consolidation will increase competition (Gelos and dam Roldos, 2002).

Based on the discussion of the structure, the concentration of the 4 largest banks (CR4) and 8 largest banks (CR8) during the 2003–2015 period was 48.13%, and the average CR8 was 62.21%. The market structure of the banking industry is monopolistic competition. This research using the structural approach of SCP was in line with research result using the non-structural approach of SCP like Panzar-Ross model (PR-model). Some researchers in Indonesia who use PR-model are Sutardjo, Daryanto et al. (2011) by estimating the function of income and cost function of the bank year 1999–2009 obtained amount of bank input elasticity of bank ranged from 0.70 to 0.97 means that all bank groups have a monopolistic competition market structure. Athoillah (2010) examines the structure of Indonesian banking competition concludes the Indonesian banking structure market is monopolistic competition. Mulyaningsih and Anne (2011) also reviewed the competition and consolidation of Indonesian banks to conclude that Indonesia's banking structure is a monopolistic competition.

The market structure is significantly influenced by the behavior performance of the banking industry. Structural elements such as BSZ characteristics and MS affect the market structure. Bank consolidation policy factors based on IBA differ from consolidation and merger but both are significant to influence concentration. If consolidation and merger will encourage higher concentration, on the contrary, IBA consolidation will decrease market concentration. Macroeconomic variables such as inflation and economic growth significantly affect the market structure, where inflation drives increased concentration while economic growth will suppress increased concentration. The previous year concentration will decrease the concentration because the bank is always monitored by the monetary authorities and KPPU in order not to have concentration or power as a monopolist.

Policy implications related to the structure of the banking industry divided to twofold. Firstly, the policy of bank regulation in the IBA policy package, especially on minimum capital and single presence policy has encouraged the ongoing merger and acquisition, issuance of new shares, or subordinated loan issuance, in order to increase the capital, has significantly affected the banking structure through decreasing market concentration and increase competition, which is empirically compatible with the theory by forming a monopolistic market structure. Second, economic stabilization policy with low inflation and high economic growth also colored the discontent of SCP and the constellation of structure, behavior, and performance of Indonesian banking industry.

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