

Does Regional Economy And Market Concentration Have An Impact On Stability And Profitability In Indonesian Regional Banking?

Sapto Jumono

Sapto.jumono@esaunggul.ac.id

Chajar Matari Fath Mala

chajar.matari@esaunggul.ac.id

Hermanto

hermanto@esaunggul.ac.id

Djoko Roespinoedji

Djoko.roespinoedji@widyatama.ac.id

Universitas Esa Unggul^{1,2,3}

Widyatama University⁴

Abstract

This study aims to investigate the influence of regional economy and market concentration on stability, credit risk, and profitability of Indonesian Regional Development Banking. We use concentration-stabilization hypothesis and structure-conduct-performance (SCP) hypothesis as the grand theory. The data used is derived from the quarterly publication financial data of Indonesian RDB banks from 2003 to 2017. This study uses saturated sampling as the basis of data collection. We employ GMM data panel regression as the research method. This research results in two main findings. First, the banking market concentration in Indonesia has a positive impact on the stability and profitability of RDB, which means that the concentration-stability theory is applied. Second, market share has a positive effect on stability, however it has an adverse effect on non-performing loans and the profitability of RDB. Based on the results, it can be concluded that regional macroeconomic conditions, market conditions, and banking characteristics have a significant role in the stability and profitability of RDB. Despite these findings, there are also influences from economic, financial, and banking systems on the stability and performance of RDB in Indonesia. To the best of our knowledge, what makes this research novel is its attempt to examine the stability and profitability of assets that come from changes in companies' external and internal environment. The findings can be used to anticipate the banking behavior in optimizing performance. In the perspective of macroeconomic policy, conceptually and empirically Indonesian banking policies have proven to be more oriented to stability and tend to sacrifice the aspects of efficiency and competition climate.

Keywords: market concentration, stability, credit risk, profitability

JEL Classification: G21, E58

1. INTRODUCTION

The banking industry possesses different characteristics compared to non-banking sectors. Intense competition within the industry results in various risks for the players to compete. Although there is deposit guarantee mechanism that regulates the market, the intense rivalry in the deposit market will result in an excessive risk-taking and a trade-off between the stability and competition of the banking market. This trade-off will eventually leads to a price war. Also, the regulatory policies regarding capital restrictions will encourage banks to reduce product or service differentiation to be more homogeneous. The debate between stability policies and competition is still ongoing until the present day. Experts who support pro-stability policy tend to opt for a strict regulations or entry barriers along with policies that encourage mergers and acquisitions. Such a condition makes the banking industry demands for exclusion and as well as specific treatment of business competition law.

Empirical data found during the period of 2010-2013 pertaining to the banking market structure proxied by CR5 (assets concentration-ratio of the five larger banks) in Indonesia showed a declining trends. In 2010, the percentage of CR5 was 57.91%. Then, it decreased to 56.46%, 55.72%, and 54.73% during 2011-2013. However, it rose to 55.75% and 56.54% during 2014-2015 (World Bank, 2017).

The concentration ratio of the five largest banks suggests that condition of the Indonesian banking market structure is still concentrated in the five largest banks. These banks control the banking assets more than half the market (around 55%) of the national market, with the remaining 45% originated from 114 banks. This disparity in the market structure can be implied as the weakening of competition because the monopolistic power of these five banks is still strong.

The Z-Score of Indonesian banking has increased over the past five years. The Z-Score from 2010 to 2015 are 4.55, 4.88, 4.99, 5.04, 5.13 and 5.23. Meanwhile, the NPL (non-performing loans) has shown fluctuation from 2010 to 2015, which are 2.53%, 2.14%, 1.77%, 1.69%, 2.07% and 2.43%. The return-on-assets (ROA) in the last five years was still high, although it tends to decrease from 2010 to 2015,

the ROA was 2.20%, 2.28%, 2.32%, 2.10%, 2.16% and 1.71% (World Bank, 2017).

Indonesian banking is grouped into six bank groups, which are the SOB (State Owned Banks) bank, RDB (*regional development bank*), FXCB (*Foreign Exchange Commercial Banks*), FOB (*Foreign Owned Banks*), JVB (*Joint Venture Banks*), and non-FXCB (*Non-Foreign Exchange Commercial Banks*). Based on the Indonesia Banking Statistics data as of December 2017, Indonesian banking assets has reached 7,387,634 billion rupiahs, while the banking profitability which is shown by ROA, reached 2.55%, and the capital adequacy ratio (CAR) is at 23.6%.

The assets ranking of Indonesian banking industry assets in the first rank was occupied by SOB bank groups (market share: 40.43%; ROA: 2.5%; CAR: 21.65%); the second is FXSCB (market share: 40.13%; ROA: 2.04; CAR: 21.06); the third is followed by RDB (market share: 8.97%; ROA: 2.36%; CAR = 22.08%); the fourth is FOB (market share: 5.57%; ROA: 2.63%; CAR: 53.09%); the fifth is JVB (market share: 4.49%; ROA: 2.46%; CAR: 22.08%); the sixth is non-FXSCB (market share: 1.2%; ROA: 1.12%; CAR: 27.65% (Indonesian Banking Statistics, 2017).

Even though RDB is in the third place, there are many thought provoking aspects from RDB to be investigated thoroughly. Based on the demographic factors, RDB is the most likely banking group to grow and develop in every province because RDB is a host bank in every province in Indonesia. RDB are mostly owned by the local, provincial government. However, the individuals of regional banks generally have not controlled the majority market in their regions.

Although RDB assets tend to increase, the size of individual RDBs is relatively small. In addition, the operational area is still limited to one or two provinces with only limited banking products offered. RDB's operational activities are also more focused on serving the needs of regional financial administration such as the salaries of regional employees and the center to store local government funds. As an agent of development, RDB's operational activities are usually more directed towards supporting regional economic programs.

Individual banks in RDB group have an important role in the economy through the national banking

system. The main task of RDB is to support the economic growth of provinces that are becoming more competitive. Moreover, ASEAN Economic Community (AEC) will force the Indonesian banking industry to deal with threats, challenges, obstacles, and opportunities. For this reason, Indonesian national banks including RDBs need to prepare their organizations to compete in the era of competition, particularly in the financial and banking services. The national financial and banking products must properly organized in order to survive in such a competitive industry. For this reason, Bank Indonesia as the central bank has applied Indonesian Banking Architecture policy programs to strengthen national banking stability and efficiency.

1.2. Research Objective

We argue the current issue about the merger of RDB banks in Indonesia if properly implemented, will increase the level of national banking market concentration. In this sense, banking stability will be stronger, but will not be efficient. For this reason, this empirical research tends to investigate the effect of market concentration on stability, credit risk, and profitability in the RDB group by linking regional macroeconomic conditions, national banking market conditions, and banking characteristic variables. It is important to understand more about RDB's actual conditions and banking characteristics in order to respond to the changes in market conditions and regional/national economies.

This study will also test the application of concentration-stabilization paradigm versus concentration-fragility theory. Therefore, we will attempt to discover which one reflects the Indonesian Banking Industry in the Regional Development group. This research will answer the fundamental question: 'Does Market Concentration Have an Impact on Stability and Profitability in Indonesian RDB (Regional development Banks)?'. Explicitly, we aim to understand the following question: 'Does market concentration of Indonesian national banking make regional banking more stable or fragile?'

2. Literature Review

2.1. Financial System Stability

The definition of financial stability is rather complicated to describe and it is difficult to be measured. The financial sector will be more stable if there is no excessive volatility. There is no range in saying excessive or not volatility. However, excessive volatility can usually be seen from movements that are relatively distant from the average movement trend.

Financial stability can be generally defined as a condition where the financial system—which consists of financial institutions, financial markets, and financial infrastructure—is able to withstand stress; hence the financial intermediation process is not disrupted (Gadanec & Jayaram, 2008). The financial system instability can be triggered by various causes or tumult. The instability of the financial system can possibly occur from an external factor (international) and internal factor (domestic). Previous researches have investigated the impact of competition and market forces on stability in a mature economy. However, our survey provides new evidence about the relationship between competitiveness and stability in lesser-known markets, which can also suggest behavior from other developing countries.

In our study, we employ traditional SCP model which assumes that in a more concentrated system, the industry will lead to less competition (Pawłowska, 2016). Wu, Chen, Jeon, and Wang (2017) have investigated whether foreign bank presence affects the risk of domestic banks in emerging economies by using annual data from 35 emerging economies located in Central and Eastern Europe, Latin America, and Asia from 2000 to 2014. They also adopted the Z-score indicator as the bank risk measure and the assets owned by foreign banks as a share of the banking sector total assets. They suggested that the risk of domestic banks increases with the penetration of foreign banks in the host economy. They confirmed that there are both positive and negative effects of foreign banks' presence in developing economies.

2.2. Banking Stability-Fragility Theory

Concerning the level of competition and banking stability, there are two opinions emerge regarding concentration. The first states that *'bank concentration*

leads to more stability' and the second sees 'bank concentration leads to less stability' (Berger, Klapper, and Turk-Ariss, 2009). The paradigm of concentration fragility theory denotes that market competition can reduce the franchise value and encourage banks to take risky policies to increase profits. This policy acquisition has the potential to increase the probability of NPLs (non-performing loans) and encourage banking defaults. The paradigm of concentration-stability theory (bank concentration leads to more stability) states that competition will encourage banks to protect the franchise value by taking safe policies to maintain banking stability (Jimenez, Lopez, and Saurina, 2013).

There are some previous studies which had common consensus with the theory of concentration fragility. Shijaku (2017), for example, examined the banking sector in Albania. He found a consistent result which supports the concentration-fragility paradigm, where it is shown Herfindahl-Hirschmann Index (HHI) that it has a significant negative effect on Z-Index. Atilla (2015) stated that the bank concentration increases NPL in Bulgaria, Croatia, Lithuania, Poland, and Slovenia in the long run. There are also other studies that support the concentration-fragility (see for example: Berger, Klapper, and Turk-Ariss (2009), Schaeck, Cihak, and Wolfe (2009), and Uhde & Heimeshoff (2009)).

The research of Noman, Ge, and Isa (2017) support concentration-stability theory, where they found that market strength measured by the Lerner index is negatively related to the Z-Score and equity ratio and positively related to the NPL ratio amongst ASEAN banks. Atilla (2015) denotes that the bank's concentration reduces the NPLs in Estonia, Latvia and Slovakia. There are also other studies supporting this hypothesis, which are Allen and Gale (2003), Beck, Demirgüç-Kunt, and Levine, (2006), Boyd, Nicolo, and Jalal (2006), Evrensel (2008), Schaeck, Cihak, and Wolfe (2009), Deltuvaite (2010), Tabak, Fazio, and Cajueiro (2011), and Fernandez, Gonzalez, and Suarez (2016)).

2.3. Structure Conduct Performance Theory vs Efficiency Structure Theory

To analyze the relationship between competition and banking efficiency, there are structural and non-structural approaches. The structural approach includes the SCP (structure-conduct-performance) paradigm which builds a direct relationship between market structure, behavior, and company performance. This paradigm assumes that when the market concentration is moderately high, corporate behavior becomes less competitive and leads to a higher level of profitability.

The structural approach is called the ESH (efficient structure hypothesis). The two main hypotheses that are developed in the empirical literature are the competition-efficiency hypothesis and the competition-inefficiency hypothesis. This competition-efficiency hypothesis is derived from the ESH theory which shows that increasing competition causes increased efficiency behavior.

There are some other studies which support SCP theory in Indonesia (Jumono, Adhikara, and Mala, 2016), Pakistan (Bhatti and Hussain, 2010), and Nepal (Gajurel, 2011). These studies suggest that high market concentration will increase profits. Other researches that support SCP theory is the research of Berger and Hannan (1989), and Sathye (2005). Their findings stated that increasing concentration of the banking market tends to reduce competition and increase profitability. Although market share has a positive and significant on profitability, market share does not indicate a relationship between the level of concentration and profitability.

Previous studies that support ESH theory in Indonesia also exist, for instance Raharjo, Hakim, Manurung, Maulana (2014), and Sarita, Zandi, and Shahabi (2012). Meanwhile, other researches that support ESH theory, for example, Samad (2008), Seelanatha (2010), Mensi and Zouari (2010), Rettab, Kashani, Obay, and Rao (2010). They discovered that profitability occurred because of an increase in efficiency. However, Al-Obaidan (2008) stated that the level of concentration is not considered an anti-competitive action. Thus, it must be considered as a consequence of bank efficiency.

Smirlock (1985) proposed that market share has a significant positive effect in profitability, concentration does not affect profitability. The efficiency gained by a bank cost saving so that the

operational costs of a bank are low and ultimately lead to the domination of market, and it turns out that concentration has no effect on profitability in the banking industry.

2.4. Franchise Value Hypothesis Theory

The franchise value hypothesis theory attempts to analyze the relationship between market structure and excessive risk-taking behavior. This mechanism explains that franchise value plays an important role in risk-taking by banks. Franchise value reduces the bank's desire to take risks and makes banks relatively conservative to protect its franchise value so that it will lead to the stability of the banking system. If at any time there is intense competition which causes profit margins to decrease, then the franchise value also decreases. As a result, management will not be paying sufficient attention to the principle of banking prudential and is likely to take excessive risk-taking to maintain its profit margin. Consequently, banks tend to allocate funds to assets and credit that are at high risk, which, however provide high-profit margins or interest income. This could potentially lead to banking system stability.

In the case of perfect competition, the bank's profit will decrease, and there is no opportunity to make excess profit. This is related to the franchise value theory which results in perfect competition. Bankers will simplify their investment selection requirements because they will benefit from taking risks in the hope of getting more profits. Conversely, if the bank has some franchise value, market power will be positive. Thus, bank managers and shareholders will be more wisely in taking risks. Bank concentration is important because it can affect the ability of bank managers to diversify bank risks. Ozili and Uadiale (2017) examined the concentration of banks in the Nigerian banking sector and found that banks in the highly concentrated sector have higher ROA ratios and net interest margins, while scattered concentration banks have lower asset returns.

3. Research Method

This nature of this study will be more towards applied research as the purpose is to apply the previous

research methods to construct the theoretical underpinnings from the findings. This research is also explanatory as it also aims to explain the causal relationship between variables through hypothesis testing. The object of this research is the banking market industry in Indonesia from RDB (Regional Development Bank). This research will attempt to observe the development of assets and banking stability. We use secondary data from published financial statements published by Bank Indonesia, World Bank, and Indonesian Banking Statistics during 2010-2017.

We use quarterly data from all RDBs which operate in Indonesia from 2010 to 2017. This research uses purposive sampling technique that abides filter specific criteria from population. The criteria are; 1) banks which are registered in Bank Indonesia 2) banks have never been merged with another bank, and; 3) banks has complete data from 2010 to 2017.

3.1. Model Specification

To create the model of the relationship between market concentration and bank stability, an econometric model is developed as follows:

$$ZScore_{it} = \alpha_0 + \alpha_1 CR_t + \alpha_2 MS_{it} + \alpha_3 ERR_{it} + \alpha_4 CPIR_{it} + \alpha_5 GDPR + \alpha_6 LDR_{it} + \alpha_7 FBITA_{it} + \alpha_8 OCTA + e_{it}$$

where Z-Score is a function of total equity and reserves/total assets added with the average return on assets (ROTA) and divided by the standard deviation of ROTA, the greater the Z-Score, the more stable the condition is

If the coefficient CR (α_1) is positively significant, the concentration-stability theory is accepted; in other words, the concentration-fragility theory is rejected. If the coefficient CR (α_1) is negatively significant, the theory of concentration-stability is rejected, nevertheless the theory of concentration-fragility is accepted.

To create a pattern of relationship between market concentration and credit risk proxied by NPL (non-performing loans), an econometric model is built as follows:

$$NPL_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 MS_{it} + \beta_3 ERR_{it} + \beta_4 CPIR_{it} + \beta_5 GDPR + \beta_6 LDR_{it} + \beta_7 FBITA_{it} + \beta_8 OCTA + e_{it}$$

$$\lambda_1 > 0, \text{ and } \lambda_2 = 0.$$

To create a model of market concentration relations with bank profitability, an econometric model is built as follows:

$$ROTA_{it} = \lambda_0 + \lambda_1 CR_{it} + \lambda_2 MS_{it} + \lambda_3 ERR_{it} + \lambda_4 CPIR_{it} + \lambda_5 GDPR + \lambda_6 LDR_{it} + \lambda_7 FBITA_{it} + \lambda_8 OCTA + e_{it}$$

$$\lambda_1 = 0, \text{ and } \lambda_2 < 0.$$

where i denotes individual banks or; while t is the quarterly period in a particular year; α , β and λ represents coefficient; Z-Score is banking stability.

The Z-Score is an indicator to measure the financial health and risk condition of banks. A higher Z-Score implies a lower probability of insolvency, providing a direct measure of soundness that is superior to analyzing leverage. The followings are explanations for the variables in the econometrics model:

- NPL = Non-performing Loan or Credit Risk
- ROTA = Return on Total Assets or Banking Profitability
- CR = Concentration Ratio
- MS = Market Share of Bank Assets
- LDR = Loan to Deposit Ratio
- FBI/TA = Proportion of FBI in Total Assets
- OC/TA = Overhead Cost Proportion of Total Assets.

According to Bhatti and Hussain (2010) and Smirlock (1985), SCP theory applies when market concentration has a significant influence on performance (ROTA). However, MS should not have a significant effect on performance (ROTA). Statistically, it can be seen in the regression coefficient as follow:

Meanwhile, ESH theory is applied when the market share has a significant effect on profitability (ROA). Nonetheless, market concentration should not have a significant effect on ROA. Statistically, it can be seen in the regression coefficients as follow:

If the result shows $\lambda_1 > 0$ and $\lambda_2 = 0$, it infers that the results of the study support the traditional SCP hypothesis. However, if the result shows $\lambda_1 = 0$, and $\lambda_2 > 0$, it implies that the results of the research support ESH thory. However, interesting results occur if the result shows $\lambda_1 > 0$, and $\lambda_2 > 0$, where this could mean that both concentration ratio and market share have a significant effect on performance. The banks gain profit from product differentiated through market share and from changes in market structure conditions.

The discussion is focused on the effect of market concentration on individual RDB groups in Indonesia with a focus on stability conditions (risk taking), non-performing loans, and profitability. The detailed discussion will be delivered by analyzing and observing the facts of the data analysis through an inferential analysis of GMM data panels. The results will be compared with the theory and the results of previous studies to make valid conclusions.

3.2. Research Variables

The operational definition variables are based on the description of the concept that has been modified by the objective circumstances that have been commonly used in previous studies.

Table 1. Operational Definition Variables and Their Measurements

| Variable | | Measurement/ Formula | Notation | Impact |
|--------------------|------------------------------------|-------------------------|--------------------------|---------|
| Dependent Variable | Stability Credit Risk Profit | ➤ Stability/Solvency | ▪ (TETA +ROA) /: σROA | Z-Score |

| | | | | | | |
|---|--------------------------|---|---|--|------------------------|-------------------------|
| | | | <ul style="list-style-type: none"> ➤ Credit Risk ➤ Profitability | <ul style="list-style-type: none"> ▪ (Non Performing Loans /Total Loan) *100% ▪ (Operating profit :Total Asset) *100 % | NPL ROTA | |
| Determinant (<i>Independent Variable</i>) | Internal banking | Liquidity Cost & Revenue Management | <ul style="list-style-type: none"> ➤ Loan to Deposit Ratio ➤ Fee Based Income Ratio ➤ Overheadcost Ratio | <ul style="list-style-type: none"> ▪ (Loan/Deposit) * 100% ▪ (Fee Based Income : Total Assets) *100% ▪ (Overheadcost :Total Assets) *100% | LDR FBI/TA OC/TA | +/-/+ +/-/+ -/-/- |
| | Banking Market Structure | Market Share & Competition | <ul style="list-style-type: none"> ➤ Market share of Assets ➤ Market Concentration of Assets | <ul style="list-style-type: none"> ▪ Individual Assets Banking/Total Assets Banking *100% ▪ Total Market Share of Assets (The Top 3-10 banks in assets market (%)) | MS CR | +/-/+ +/-/+ |
| | Macro Economy | Exchange Rate Inflation Economy Activiy | <ul style="list-style-type: none"> ➤ Exchange Rate-regional ➤ Inflation –regional ➤ GDP-regional | <ul style="list-style-type: none"> ▪ IDR/USD ▪ (CPIt-CPIt-1) /: CPIt-1) *100 ▪ (GDPIt-GDPIt-1) /: GDPIt-1) *100 (Constant Price) | ERR CPIR GDP-R | -/+/- -/+/- +/-/+ |

4. Empirical Results

4.1. Impact of Market Concentration on Banking Stability

Competition can be interpreted as a competitive situation for several parties in contending over something. Bank competition can be measured by

bank concentration approach, market power and company market share. In addition, it can also be measured by looking at patterns of interaction between banks in the banking industry market (Weill, 2013). In this study, the bank's percentage is measured by CR3-10 (concentration-ratio from three to ten) of the largest banks in Indonesia.

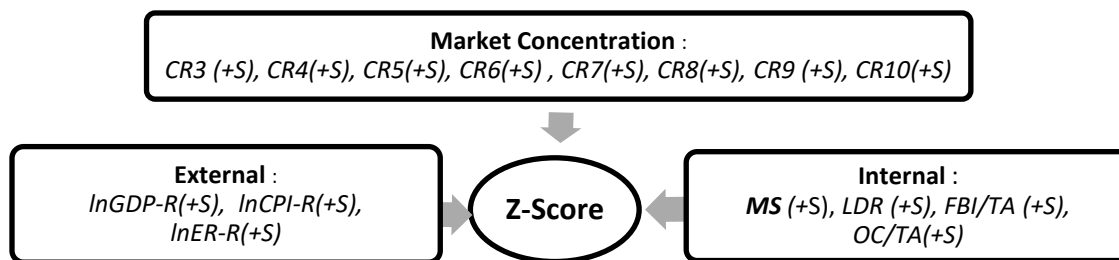


Figure 1. Factors That Influence Z-Score

Figure 1 (summary from Table 2) encapsulates results of research on the effect of CR on banking stability. Overall, the results of this study show that the Z-Score as a proxy of the stability of individual banks in the RDB group is significantly affected by external conditions such as banking market conditions, macroeconomics, and internal banking conditions, e.g. liquidity management, cost and revenue management.

4.1.1 The Effect of Market Concentration and Market Share on Z-Score

Z-Score is an indicator that represents the condition of financial health and total bank risk. A higher Z-Score implies a lower probability of bankruptcy, providing a direct measure of health that is superior to analyzing leverage. The higher the Z-Score value reflects the stability of the bank which is getting higher. The calculation of the Z-Score here refers to the one used by Fernandez, Gonzalez, and Suarez (2016) and Berger et al. (2009); they argue that competition and concentration influence each other and significantly influence bank risk taking.

A significant positive effect of CR3 to CR10 on the Z-Score (see models 1-8 attachment 2) implies that the development of the Indonesian banking market concentration is in line with the stability of the RDB group bank. This study suggests that the higher the market concentration or the lower the competition between banks will make RDB banks more stable.

The increase of bank concentration caused a decrease in bank competition and increased collusion behavior in conventional and sharia banks. However, collusion essentially creates stability for banks. On the contrary, the results of this study contradict the research of Mirzaei,

The result is conducted by the GLS method. The results of this panel data regression modeling in this study indicate that the market concentration shown by the variables CR3 to CR10 with control variables such as liquidity (LDR), fee based income (FBI/TA) and overhead cost (OC/TA) and regional economic developments such as GDP, inflation, and exchange rate was proven to have a significant effect on the Z-Score of banks.

Moore, and Liu (2011) who concluded that market concentration has a negative effect on risk-taking and bank profitability in developing countries. In other words, the higher interest spreads increases risk taking. The results of this study is not in line with franchise value theory which states that lower concentration causes bank's profit margin to decrease, because the competition is getting more intense, this, causing the franchise value to decrease. As a result, banks tend to neglect banking prudential principles and tend to take excessive risk-taking measures in an effort to maintain their profit margins. Accordingly, banks tend to allocate funds to high-risk assets and credit but provide high profit margins or interest income, so it has the potential for reducing the stability of the banking system.

The analysis of panel data regression shows that MS (market share) has a significant positive effect on stability, (see Models 1-8, Attachment 2). The significant and positive effect of market concentration and market share on the Z-Score indicates that the condition of banking stability in the RDB group is influenced by changes in market competition and market share (as a proxy of product differentiated banking efficiency). The combination of the strengths of the market structure concentration and conduct of banking factors in the formation of product efficiency is

synergized in strengthening the stability (Z-Score) of banks.

Table 2. The Impact of Macroeconomy and Concentration Ratio on Banking Stability

| Independent Variable | Model | | | | | | | |
|---------------------------|----------------------------|----------------------------|----------------------------|---------------------------|----------------------------|------------------|---------------------------|---------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig |
| LDR | 0.04691 a | 0.04654 a | 0.04860 a | 0.0494 a | 0.04899 a | 0.04854 a | 0.04869 a | 0.04815 a |
| FBI/TA | -0.50680 a | -0.52598 a | -0.52144 a | -0.5190 a | 0.51435 a | -0.51416 a | -0.5130 a | -0.5115 a |
| OC/TA | 0.48387 a | 0.52211 a | 0.48573 a | 0.4883 a | 0.48870 a | 0.50459 a | 0.50804 a | 0.51308 a |
| MS | 2.38352 a | 2.25746 a | 2.38015 a | 2.36861 a | 2.37274 a | 2.33928 a | 2.32507 a | 2.31577 a |
| CR3 | 62.0863 a | | | | | | | |
| CR4 | | 25.0318 a | | | | | | |
| CR5 | | | 44.1684 a | | | | | |
| CR6 | | | | 39.571 a | | | | |
| CR7 | | | | | 41.7372 a | | | |
| CR8 | | | | | | 42.9506 a | | |
| CR9 | | | | | | | 43.352 a | |
| CR10 | | | | | | | | 46.418 a |
| lnER-R | 2.32019 a | 2.99305 a | 3.15195 a | 3.5889 a | 4.32641 a | 4.63298 a | 4.56313 a | 4.74529 a |
| lnCPI-R | 7.80408 a | 7.67863 a | 7.73158 a | 7.7273 a | 7.70837 a | 7.57575 a | 7.52679 a | 7.46047 a |
| lnGDP-R | 0.68806 a | 0.72695a | 0.68828 a | 0.6922 a | 0.69132 a | 0.70177 a | 0.70573 a | 0.70841 a |
| _cons | -87.1432 a | -82.1368 a | -93.4661 a | -96.806 a | -105.89 a | -110.148 a | -110.67 a | -114.98 a |
| Model | GLS | GLS | GLS | GLS | GLS | GLS | GLS | GLS |
| R² | 0.2315 | 0.2235 | 0.2314 | 0.2303 | 0.2308 | 0.2295 | 0.2288 | 0.2288 |
| R² Adj | 0.2237 | 0.2157 | 0.2237 | 0.2226 | 0.2230 | 0.2218 | 0.2210 | 0.2211 |
| Wald Chi ² (8) | 242.45 | 231.72 | 242.36 | 240.90 | 241.50 | 239.81 | 238.80 | 238.83 |
| Prob > chi ² | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| N of obs | 805 | 805 | 805 | 805 | 805 | 805 | 805 | 805 |

| N of groups | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
|--------------------------------------|---------|---------|--------|--------|--------|--------|--------|--------|
| OLS/RE/FE | RE | RE | FE | FE | FE | FE | FE | FE |
| Mean VIF | 1395.86 | 1385.62 | 521.85 | 500.19 | 491.83 | 502.64 | 520.01 | 535.86 |
| BPT /WWH; Pr- chi ² | 0.0091 | 0.0260 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| WTA; Prob- F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

a: significant at $\alpha=1\%$; b: significant at $\alpha=5\%$; c, $\alpha=10\%$

Note: Based on Panel Data Procedures, the best research model is GLS model

4.1.2 External Factors

Other external factors that significantly affect the stability of RDB banks are ERR development (regional exchange rate) and GDP-R (gross domestic regional). These external variables have a positive and significant effect on Z-Score. The forex market condition which is shown by the dynamics of the ER movement (proxied by the IDR/USD exchange rate) implies how IDR fluctuates towards the USD. If IDR weakens against the USD, then the individual RDB assets value—which is denominated in IDR—will decrease. However, stability can still be preserved because of the strong capital (CAR).

The provincial economic which is represented by GDP-R has a significant and positive effect on Z-Score. This shows a normal relationship because the financial system is a derivation of the actual sector in the economic system. Therefore, if regional economic activity increases then the ability of the banking system to mobilize public fund will also rise. The ability of banks to increase capital through profitability will rise and strengthens stability.

4.1.3. Internal Factors

The internal factors that significantly influence the Z-Score are LDR, FBI/TA, and OC/TA. LDR (loan to deposits ratio) has a positive impact on the Z-Score. This shows a normal relationship, which implies that RDP is getting better in mobilizing public funds, indicated by a high LDR. This will make net interest margin increase, and banks will be able to strengthen capital through retained earnings.

The OC/TA variable as the representation of the bank's overhead cost has a positive impact on the Z-Score. This means that the role of the efficiency of cost operating is able to increase the Z-score of the bank significantly. Management capabilities in cost allocation are effective; therefore, bank operational activities are more efficient especially in service activities, collection, and distribution of public funds. The banking activity provides a positive value because marginal revenue is higher than the marginal cost ($MR > MC$). This condition can increase profitability and capital. Thus, the development of effectiveness and efficiency of cost operating can improve banking stability.

4.2. The Effect of Concentration Ratio on Non-Performing Loan (NPL)

This study uses two indicators of bank risk as the proxy of bank stability; i.e., Z-Score and NPL. Z-Score can be a proxy of overall bank risk. A high Z-Score value reflects high bank stability. Meanwhile, non-performing loans are the ratio between the amount of non-performing loans from the total value of loans disbursed as a reflection of the risk of the bank's credit portfolio. The higher the NPL value, the higher the bank credit risk.

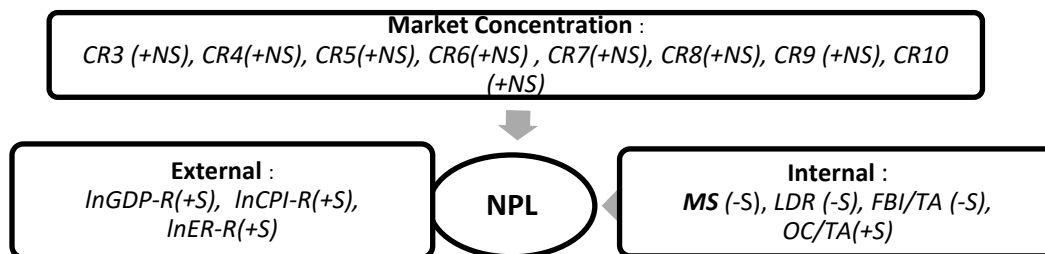


Figure 2. Factors That Influence NPL

Boyd and DeNicolo (2005) stated that a concentrated banking system allows banks to charge higher loan interest rates, which can encourage borrowers to opt for higher risks. As a result, the volume of NPLs (non-performing loans) increases and the probability of bank failures are high. Bank risk may not increase if market forces drive risk assets portfolios because banks may protect their charters' value by using other methods to offset greater risk exposures. This method may comprise of increasing capital, reducing interest rate risk, and selling credit derivatives.

4.2.1. The Effect of Concentration Ratio and Market Share on NPL

To examine the competition-fragility hypothesis where credit risk is directly influenced by the level of market competition, NPL is used as a measure of bank stability which reflects credit risk as a result of the risk-taking the behavior of each bank. NPL can be proxied as an indicator of bank stability because it shows the quality of banking assets. A high NPLs are identical to poor banking condition, where banks will tend to be unstable. Conversely, if the NPL trend decreases and is small, this indicates that banking conditions are getting better in terms of quality and stability.

Table 3. The Impact of Macroeconomics and Concentration on Non Performing Loan

| Independent Variable | Model | | | | | | | |
|----------------------|-----------------|------------------|----------------------|----------------------|----------------|--------------|--------------|--------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig |
| LDR | -0.03325 a | -.032968 a | -0.0331 a | -0.0331 a | -0.0332 a | -0.0332 a | -0.033 a | -0.0332a |
| FBI/TA | -0.59521 a | -0.59802 a | -0.5961 a | -0.5952 a | -0.5941 a | -0.5944 a | -0.5942 a | -0.5946 a |
| OC/TA | 0.77741 a | 0.78192 a | 0.7777 a | 0.77623 a | 0.7765 a | 0.7768 a | 0.7770 a | 0.7781 a |
| MS | -1.0263 b | -1.0432 b | -1.028 b | -1.0226 b | -1.0232 a | -1.022 b | -1.023 b | -1.026 b |
| CR3 | 3.595227 | | | | | | | |
| CR4 | | -0.397592 | | | | | | |
| CR5 | | | 2.38418 9 | | | | | |
| CR6 | | | | 3.10822 5 | | | | |
| CR7 | | | | | 3.10728 | | | |

| | | | | | | | | |
|--------------------------------------|------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|
| CR8 | | | | | 6 | 3.97986 1 | | |
| CR9 | | | | | | | 4.09690 4 | |
| CR10 | | | | | | | | 3.77106 4 |
| lnER-R | 3.1308 a | 3.12493 a | 3.1712 a | 3.23095 a | 3.2804 a | 3.3441 a | 3.3419 a | 3.3275 a |
| lnCPI-R | 1.5498 a | 1.52737 a | 1.5448 a | 1.55101 a | 1.5485 a | 1.5405 a | 1.5361 a | 1.5300 a |
| lnGDP-R | 0.8389 a | 0.84396 a | 0.8392 a | 0.83768 a | 0.8379 a | 0.8376 a | 0.8378 a | 0.8388 a |
| _cons | -50.387 a | -48.8889 a | -50.654 a | -51.604 a | -52.149 a | -53.274 a | -53.408 a | -53.160 a |
| Model | GLS | GLS | GLS | GLS | GLS | GLS | GLS | GLS |
| R² | 0.2367 | 0.2365 | 0.2367 | 0.2368 | 0.2368 | 0.2369 | 0.2369 | 0.2368 |
| R² Adj | 0.2290 | 0.2288 | 0.2290 | 0.2291 | 0.2291 | 0.2292 | 0.2292 | 0.2291 |
| Wald Chi ² (8) | 248.10 | 247.86 | 248.07 | 248.27 | 248.24 | 248.41 | 248.40 | 248.25 |
| Prob > chi ² | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| N of obs | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| N of groups | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| OLS/RE/FE | RE | RE | FE | FE | FE | FE | FE | FE |
| Mean VIF | 583.07 | 462.23 | 521.79 | 500.01 | 491.46 | 502.22 | 519.51 | 535.33 |
| BPT /WWH; Pr- chi ² | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| WTA; Pr-F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

a: significant at $\alpha=1\%$; b: significant at $\alpha=5\%$; c, $\alpha=10\%$

Note: Based on Panel Data Procedures, the best research model is GLS model

Table 3 shows that NPL is not affected by concentration. However, NPL is significantly affected by external macroeconomic conditions and internal bank conditions, e.g., liquidity management, cost and revenue management. Coefficient of CR3 to CR10 have no significant effect on NPL (see Models 1-8, Table 3). This means that the dynamics of market concentration do not significantly affect NPL.

This suggests good condition for RDB because credit risk is not affected by market concentration. Consequently, the credit risk which is resulted by risk-taking the behavior of each bank is not caused by changes in market concentration. A high or low level of competition does not affect credit risk. This

means that the policy of strengthening national banking in Indonesia through consolidation of mergers/acquisitions that tend to increase market concentration is found to be not affecting credit risk.

Practically, the competitive conditions in the banking market in Indonesia cause RDBs to be more vigilant in selling their credit products, aiming to reduce market risk. The influence of competition encourages the management of the RDB to strive in order to improve its credit quality. Therefore, NPL is depressed and stability is maintained. Small NPL is identical to the improvement of banking stability, especially in the credit market.

This result is consistent with the research of Jiménez et al. (2010), who found that the level

of bank concentration did not significantly influence the stability. However, this result is inconsistent with the findings of De Young and Torna (2013), Stiroh and Rumble (2006), and Lepetit et al. (2008) and Mercieca et al. (2007). Non-performing loans tend to increase with the strength of the position of a bank in the market that encourages banks to take higher risks and have serious consequences for their financial stability.

Meanwhile, the influence of the individual market share of RDB banks on NPLs is negative and significant. This is a normal condition because the market share as a representation of the diversity of products has a significant impact on NPL. This means that bank marketing management manages to develop market share significantly so that the quantity and quality of banking assets increase. This can be seen from the decline in NPLs. The negative influence of market share shows that RDB credit management is able to manage credit market risk well.

4.2.2. The Influence of External Factors on NPL

The external factors that significantly affect NPL are regional economic indicators, e.g., the development of the exchange rate of IDR/USD (lnER-R), CPIR (lnCPI) and GDP-Regional (lnGDP-R). These variables statistically have a significant and positive effect on NPL. The positive coefficient of lnER-R (regional exchange rate) shows that the exchange rate of IDR/USD against the USD moves in the direction of the NPL. This means that if IDR weakens against the USD, then RDBs assets which are mostly denominated in IDR is decreasing. There is often an increase in credit risk due to high interest rates, so that the potential for debtors is threatened to default, the potential for non-performing loans to rise.

The impacts of provincial regional economic activities are represented by the development of GDP-R and CPIR movements which are in line

with NPL. This indicates that if economic activity rises, the demand for credit and prices in the output market will rise, and as a result, the credit risk increases simultaneously.

4.2.3. The Influence of Internal Factors on NPL

The internal banking factors that have a significant impact on NPLs are LDR, FBI/TA and OC/TA. The negative relationship between LDR and NPL shows a normal condition. A significant increase in LDR performance in the RDB in mobilizing rising public funds did not increase NPL. An increase in LDR reflects good economic conditions which makes debtors' payment power increased so that non-performing loans decreased.

FBI/TA also has a negative impact on NPL. This means that the role of banking product development also impacts the increase in bank credit volume. However, the credits have a higher increase than non-performing loans. This also shows that sales of interest-based bank services and fee based income move in the same direction.

The OC/TA variable has a positive impact on NPL. This means that the role of the efficiency of operating costs that focus on bank quality improvement activities can improve the quality of bank asset management. The development of the effectiveness.

4.3. The Influence of Concentration Ratio on Profitability

Based on SCP (Structure-Conduct-Performance) hypothesis which is developed by Mason (1939) and Bain (1951), a competitive market caused by the low level of market concentration will make a higher level of profitability of banking. Meanwhile, Efficiency Hypothesis stated that high competition causes the company's efficiency behavior to increase.

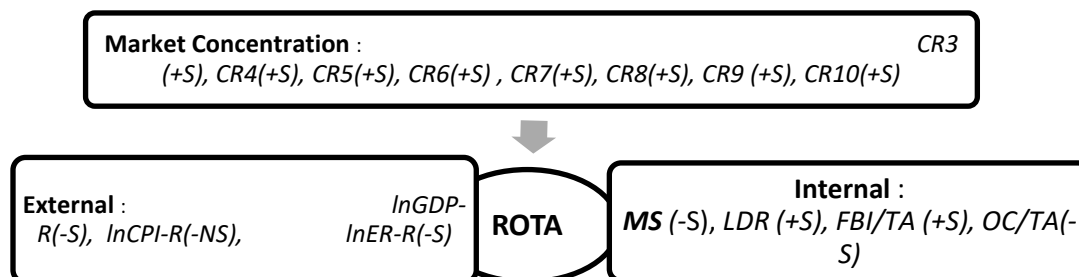


Figure 3. The Research Result of Factors Affecting ROTA

Figure 3 (a summary illustration from Table 4) shows that ROTA (return on total assets) as a proxy of individual profitability of RDB banks is significantly affected by external conditions such as banking and macroeconomic markets along with RDBs' internal conditions such as liquidity management, cost and revenue management.

4.3.1. The Influence of Concentration and Market Share on Profitability

The results of this study indicate that market concentration has a positive effect on profitability; meanwhile, market share has a significant negative effect on profitability. This implies that RDB profitability is supported by a concentration factor. However, market share which represents differentiated products, in fact, has a negative effect on profitability. This indicates that there is a practice of applying SCP theory. Theoretically, this shows that management of RDB industry at the provincial level applies the SCP theory and there is no evidence of efficiency hypothesis. In the long term, market competition is getting more intense and market concentration will be more saturated. The key to the success of market share

expansion efficiency lies in maintaining and improving differentiated product development.

Efficient management of market share is essential in order to increase profitability. This research is in line with the results of Jumono, Abdurrahman, and Mala (2017) which shows that market concentration proxied by HHI (dephhi and loanhhi) has a significant positive effect on profitability, while the individual market share (msdep and msloan) impact does not significantly affect profitability. This indicates that the Indonesian banking industry is still collusive.

4.3.2. The Influence of External Factors on Profitability

Other significant external influencing factors are developments in the regional/provincial IDR/USD exchange rate (lnERR) and regional GDP development (lnGDP-R). Statistically, these variables have a significant negative effect on ROTA. The negative regional economic impact of the province represented by lnGDP-R, lnCPIR and lnERR shows that the development of regional economic output with bank ROTA is not moving in parallel.

Table 4. The Impact of Macroeconomics and Concentration Ratio on Banking Profitability

| Independent Variable | Model | | | | | | | |
|----------------------|-----------|-----------|-----------|----------|-----------|----------|----------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig | Coef.sig |
| LDR | 0.04051 a | 0.03968 a | 0.04133 a | 0.0416 a | 0.04137 a | 0.0412 a | 0.0412 a | 0.0409 a |
| FBI/TA | 0.38763 a | 0.38424 a | 0.37957 a | 0.3802 a | 0.38288 a | 0.3836 a | 0.3842 a | 0.3857 a |

| | | | | | | | | |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| OC/TA | -0.24184 a | -0.23285 a | -0.23440 a | - 0.2337a | -0.2363 a | -0.2324 a | -0.2315 a | -0.2309 a |
| MS | -0.76384 a | 2.25746 a | -0.79145 a | -0.7947 a | -0.7827 a | -0.7884 a | -0.7921 a | -0.789 a |
| CR3 | 22.843 a | | | | | | | |
| CR4 | | 13.429 a | | | | | | |
| CR5 | | | 11.776 a | | | | | |
| CR6 | | | | 10.521 a | | | | |
| CR7 | | | | | 12.900 a | | | |
| CR8 | | | | | | 14.185 a | | |
| CR9 | | | | | | | 14.521 a | |
| CR10 | | | | | | | | 16.808 a |
| lnER-R | -2.68360 a | -2.33237 a | -2.45597 a | -2.3404 a | -2.0601 a | -1.9176 a | -1.9304 a | -1.8051 a |
| lnCPI-R | - 0.000538 | - 0.011007 | - -0.05402 | - 0.05534 | - 0.04996 | - 0.08865 | - 0.10453 | - 0.12692 |
| lnGDP-R | -0.1827 b | -0.1752 b | -0.1746 b | -0.1735 b | -0.177 b | -0.1752 b | -0.1741 a | -0.1748 a |
| _cons | 21.3123 a | 20.3876 a | 21.7963 a | 20.929 a | 16.7783 a | 14.521 a | 14.139 a | 11.357 b |
| Model | GLS | GLS | GLS | GLS | GLS | GLS | GLS | GLS |
| R ² | 0.3578 | 0.3571 | 0.3486 | 0.3478 | 0.3515 | 0.3520 | 0.3516 | 0.3538 |
| R ² Adj | 0.3514 | 0.3507 | 0.3421 | 0.3412 | 0.3450 | 0.3455 | 0.3450 | 0.3473 |
| WaldChi ² (8) | 448.56 | 447.19 | 430.80 | 429.28 | 436.29 | 437.27 | 436.44 | 440.73 |
| Prob > chi ² | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| N of obs | 805 | 805 | 805 | 805 | 805 | 805 | 805 | 805 |
| N of groups | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| OLS/RE/FE | RE | RE | FE | FE | FE | FE | FE | FE |
| Mean VIF | 583.27 | 460.55 | 521.85 | 500.19 | 491.83 | 502.64 | 520.01 | 535.86 |
| WWH; Pr Chi ² | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| WTA; Pr-F | 0.0019 | 0.0012 | 0.0001 | 0.0003 | 0.0006 | 0.0019 | 0.0027 | 0.0034 |

a: significant at $\alpha=1\%$; b: significant at $\alpha=5\%$; c, $\alpha=10\%$

Note: Based on Panel Data Procedures, the best research model is GLS model.

The effect of lnERR and lnCPIR is normal, because the decline in the exchange rate of the IDR against the USD and inflation fundamentally decreases economic activity so that the banking industry as a derivative is affected by weak performance of profitability. Statistically this is

indicated by negative coefficients on the lnERR and lnCPI-R variables.

Exchange rate shows the strength/weakening of IDR against USD which moves inversely with ROTA. If the value of IDR decreases against USD, the assets of the RDB which are mostly denominated by the IDR will decline fundamentally.

The interest rates, interest income, and profitability will consequently rise. If inflation rises—which are marked by a rising CPI—then purchasing power decreases in aggregate, diminishing the economic activities. The banking activity subsequently decreases in mobilizing public funds. Therefore, the profitability of ROTA diminishes.

4.3.3. The Influence of Internal Factors on Profitability

The internal factors that have a significant impact on ROTA are LDR, FBI/TA, and OC/TA. LDR has a positive impact on ROTA which shows a normal relationship. The increase in LDR means that the RDB's performance in mobilizing public funds is increasing. Thus, the acquisition of NIM (net interest margin) has increased, and it causes ROTA also to surge.

FBI/TA variable as a representation of fee based income—which is part of bank revenue—also has a positive impact on ROTA. This means that the role of the FBI in increasing revenue can increase ROTA. In other words, the development of banking products via the FBI is able to increase more revenue so that ROTA is also pushed up.

The OC/TA variable as a representation of overhead cost has a negative impact on ROTA. Meaning, overhead cost savings increase bank's ROTA. The development of bank cost efficiency via cost-revenue management was able to save more bank operating costs, and it will increase ROTA.

5. Conclusion and Implication

5.1. Conclusion

The results in this study shows that concentration and market share positively influence stability. Meaning, the paradigm of "concentration-stability" applies to the RDB. This study also builds upon empirical evidence that management protects the value franchise by opting for safe policies to maintain banking stability. This study also shows that market concentration does not significantly affect NPL, while market share has a negative effect on NPL. This signifies that RDBs management is able to mitigate the risk of market competition dynamics so that the credit risk is not affected. This

shows that there is a mechanism for implementing the franchise value hypothesis and concentration-stability theory. Therefore, RDBs become more stable. RDB management behavior tends to maintain a high lending rate to maximize profitability and reduce the probability risk to maintain the stability of the banking system.

It is discovered that there is a significant positive relationship between market concentration and profitability, whereas market share has a negative impact on profitability. This indication shows that the "SCP hypothesis" paradigm applies. It infers that the structure of the national banking market contributes positively to RDB's performance. Nonetheless, the performance is influenced negatively by market share. This information suggests that the achievement of profitability is affected due to the condition of the market structure that is still concentrated. The role of market share of RDB individuals is not efficient in increasing bank profitability because the market share here reflects more power of different banks products that have not been able to strengthen banking characteristics.

Basic conditions which are represented by the rate of development of regional economic variables, e.g., ER (Exchange Rate), CPI (Consumer Price Index) and GDP-CP (Gross Domestic Product-Constant Price) have a significant positive effect on Z-Score and NPL, while profitability has a negative effect. Banking characteristics which are represented by rate of development of LDR (loan to deposits ratio) have a significant positive effect on Z-Score, NPL and profitability. The development of the FBI / TA variable (fee based income ratio) has a significant negative effect on ZScore and NPL but has a positive effect on profitability. The development of OC/TA (overhead cost ratio) variables has a significant positive effect on stability and NPL, However, it has a negative effect on profitability.

5.2 Implication

The application of the concentration-stability hypothesis that applies to RDB group banks implies management actions to protect the franchise value by establishing a high lending rate policy for the benefit of bank profit maximization and stability. Thus, it is highly recommended to make the regulations and policies regarding interest rates be systematized to protect consumers from this

collusion behavior. The Financial Services Authority, Business Competition Supervisory Commission, and Bank Indonesia need to find an optimal point of concentration that creates competition and stability for banks. This research amplifies the fact of the dominance of the big players in the banking industry. For this reason, regulators need to immediately control the implementation of banking business competition to create a healthy competition environment. Ultimately, banks can carry out its intermediary function in order to promote welfare amongst society.

The invalidity of the concentration-fragility hypothesis and the efficiency hypothesis of the ESH version in the RDB group implies that RDB banks will ignore the application of price efficiency and the development of differentiated products. Therefore, it is suggested that RDB strengthen market share with an orientation to effectivity and price efficiency and product development banking characteristics. The validity of the SCP theory hypothesis in the RDB group is in line with the utilization of market concentration which may have the potential for collusion to determine prices to increase profitability. This is not an ideal condition as consumers will be harmed by pricing that comes from collusion. Thus, to be able to survive in the midst of competition, it is advisable that banking management need to have a mature and innovative strategy, so that public's trust increases and banks in carrying out the intermediary function, fund investment and distribution, can minimize the risk of default. From the macro perspectives, regulations and policies are needed to reduce and prevent collusion. Operational oversight of the quality and price of products in the banking market needs to undergo extra attention to protect banking consumers.

Liquidity which is proxied by loan to deposit (LDR) has a significant positive effect on the Z-Score and profitability. It also has a significant negative effect on the NPL, in the long run where a price war is not sustained. It is recommended that banks are prepared to sustain revenue while maintaining primary revenue from interest income. However, fee-based income also needs to be developed, while maintaining cost effectivity so that the bank's profitability and stability are maintained and sustainable. GDP growth has a significant effect

on profitability in several large banks in Indonesia which will increase the excess surplus of the community or channeling credit for financing. Therefore it is recommended that the government and policy makers shall manage economic growth in various sectors because the growth of various economic sectors will have an impact on the development and profitability of the banking industry.

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