**Market Structure, Income Diversity and Stability:**

**Empirical Study of Banking Industry Indonesia**

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Abstract

Banking as an intermediary institution has an important role in the world of economy. Apart from providing financing to the real sector, banks currently still dominate the Indonesian financial system with a share of 69.75%. Based on the existing conditions, the banking market of Indonesia still to dominated by several banks, especially in the BUKU 4 bank group. This is to indicates a banks of indonesia are generally still facing relatively low competition. In addition, the large of concentration makes it necessary for banks to divert their main activities by diversifying into non-traditional activities in carrying out their operations. This study aims to analyze how the market competition in Indonesia during of period 2014-2018 and to examine the effect of competition and diversification income on stability bank. The panzer rosse model is used to analyze the market structure, for diversification this research uses calculations with the Herfindahl Hirshman Index while stability uses two risk measures, namely NPL and Z Score as a proxy for stability. The results show that in general the banking industry is under monopolistic competition. Competition have to significant effect on stability banks, and this research to support on the competition-fragility paradigm. A meanwhile diversification income variable have not effect on stability.

**Keywords: Competition, Panzar Rosse, Diversification, Stability, Risk Taking**

1. **INTRODUCTION**

Indonesia is one of the countries categorized as bank based country, where an economy is still largely dependent on the existence of banks. This can be seen from the large dominance of the banking market on the financial system of 69.75% (Bank Indonesia, 2018). Data from the Financial Services Authority noted that the sum of banks in Indonesia from 2014-2018 tended to decline from 119 to 115. The decrease was caused by several corporate actions such of consolidation (mergers/acquisitions) and revocation of operating licenses. The corporate action taken is not only to strengthen capital, but also an to improve the market network so that it is expected to be able to compete competitively. However, based on OJK data, the banking market is currently still dominated by several banks, especially in the BUKU 4 bank group. This can be seen from 2014-2018 that the group of banks also tend to there increase in market share both in terms of credit, deposits and assets with an average share of 47.25% in loans, 53.32% in deposits and 50.42% in assets as shown in Figure 1.

Figure 1 Market Share Commercial Banking of Indonesian 2014-2018

Source: Financial Services Authority, 2020

The high level concentration has the potential to create an oligopoly or monopoly competition. In general, the measurement of the level of competition can be measured by two approaches, structural and non-structural. Research related for competition, especially banking in Indonesia, the most still uses structural methods by looking at market structure information, namely the market share of several large banks against the number of existing industries known as market concentration. While the non-structural method focuses more on the company's financial information and assesses the difference in cost structure from competitive prices. The some methods as usually to measure competition with non-structural approach are the Iwata model (1974), the Bresnahan-Law model (1982) and the Panzar-Rosse model (1987).

Changes in the level of competition can have an impact on risk bank, so this can too have an impact on banking stability (Berger et al. 2013). There are two contracditory views on explaining the relation competition and banking stability. The first, paradigm of competition fragility (concentration-stability) explains the level competition can reduce profits banks and encourage behavior bank to take a greater risks in an effort to increase profits (Noman et al. 2017). Banks with a large market share will tend to have a stronger bargaining position so that they are more likely to take higher profits. When the bank manages to get high profits, the bank tends to be more careful so that it will reduce risk (Wibowo, 2017)..

The second view is competition stability (concentration fragility), namely a competitive market will set interest rates at a low level to attract customers so that banks tend to avoid the risk of loss. On the other hand, low competition marked by a higher level of concentration in the banking market will lead to lower financial fragility and pricing power, so that this will increase banking risk exposure (Molyneux et al. 2014). Another rationale is that a concentrated banking market will increase moral hazard in taking higher risks. This condition has the potential to generate risk of loss which in turn can affect the stability of the bank. This is because they believe in the too big to fail policy that they will explicitly or implicitly be protected by the government safety net (Apriadi et al. 2017). The banking system that is concentrated in a few large banks can threaten the risk of failure and cause losses that involve many depositors. Thus the government will always provide safety guarantees in order to avoid the possibility of systemic risks (Clark et al. 2017). The existence of high market pressure pressures causes each bank to need to increase its income diversification in order to survive in carrying out its operations (Revida 2019).

The difference in market share which is quite significant is a challenge for most banks to continue to exist in their business activities. One of the efforts that can be done is to improve the quality of financial services that switch to non-traditional businesses. Currently it is known that most banks have expanded their income sources from previously focused on traditional financing by relying on spread rates, but now every bank is required to be more innovative in creating income outside of its traditional business such as treasury trading, bancassurance, card business, transactional business through optimization of digital banking and other payment transaction services that generate non-interest income. The diversification aims to fulfill the demand function as well as maintain cash flow and increase profits, so that it can provide financial benefits. Some previous literature emphasizes the importance of income diversification as an effort to reduce risk (Abuzayed 2018).

This study aims to analyze the level of competition banking in Indonesia and the effect of competition and income diversification on stability. This research, apart give to empirical information, and also expected to contribute practically to banking on how they can implement to market control strategies. For regulators, this research is expected to be the basis for policy formulation in maintaining banking stability, given the importance of this institution in supporting the country's economy.

This paper process as follows. section 1 Introduction which is the background. Section 2 describes the development of the Hypothesis. Section 3 describes the methods, data and analysis. Then section 4 provides the results, discussion and conclusions.

1. HYPOTESIS DEVELOPMENT

**Market Structure**

Market concentration, also known as monopoly power, is the company's ability to set prices above its marginal cost in an imperfect competitive market environment. In imperfect competition, it can be seen from the entry barriers that are strong enough for companies outside the market to enter the market and one of them is the oligopolist as the price leader, namely the seller who has the largest market share. In the context of Indonesian banking generally the banking market is mostly focused on BUKU 4 or banks with the largest capital ownership consisting of five banks from 115 banks with control of half of the entire existing market, it can be assumed that the Indonesian banking industry is in imperfect competition conditions.

H1: Commercial banks Indonesia are in a condition of imperfect competition

**The Effect Competition on Stability**

The competition-stability view states that a highly concentrated market causes financial fragility and bank behavior to take greater risks. In terms of "too big to fail" or "to important to fail" which bank is concentrated to large banks, has the potential to threaten the health and safety of the banking system as a whole so that it poses a systemic risk to the financial system and economy. The theory of stability-competition is built on the paradigm of risk-shifting theory, which states that banks with large market power have a significant impact on systematic risk. This causes the government will more attention, resulting in bank moral hazard behavior by setting high interest rates (Clark *et al*. 2018). This will encourage borrowers to use the funds on riskier projects leading to high default. In contrast to competition fragility which has the opposite paradigm. In this view, a concentrated market will greatly benefit, considering that banks with large market power have a bargaining position which can have an impact on the amount of profits obtained. When a bank manages to get high profits, banks tend to be more careful in running their business and reduce the hight risk of taking high that can have an impact on bank stability. Based on this statement, the hypothesis developed is

H2: Competition affects bank stability

**The Effect Income Diversification on Stability**

Currently, bank activities are not only focus on the intermediation function, where credit is the main source of income. Currently, it is known that banks have expanded their sources of income through various services in the field of financial services. According to Shim (2019), diversification can provide benefits related to scope or economies of scale, can reduced income volatility and other synergies on finance. In addition, according to Alkhouri and Arouri (2018), diversification in banking industry may create of value. The increase in the value of banks comes from the economic scope, banks usually benefit from long-term relationships with their customers that can help them collect important and diverse information on other customers, which can be used in shaping their investment portfolio. In addition, the benefits of technological progress can be attributed to diversification. This is because the larger the bank, diversifying its products by utilizing technology can improve performance and profit. Lee et al. (2014) on his research show that income diversification has a positive effect on banking performance and stability. A while Nguyen et al. (2012) on his research income diversification can provide positive benefits to bank stability, especially banks that have large market power. Based on this statement, the hypothesis developed is

H3a: Diversification has a positive effect on bank stability

Following Amidu and Wolfe (2013), Abuzayed et al. (2018) and Ul Huq (2019) This study also specifically analyzes the diversification of the bank's income structure obtained from non-interest (fee based income) is namely commissions or fee, trading income and other non-interest income. The greater the income from non-interest products produced will increase the profits of a bank and be able to reduce the risk of loss. Messier et al. (2014) in their research shows that income generated from non-interest provides benefits to the profits banks. Meanwhile, according to Sawada (2013) non-interest income, especially those from fees and commissions, can reduce non-systematic risk. Furthermore, with the increasing number of trade transactions, both nationally and internationally, transaction services both in foreign currency and in the form of securities have increased. This can have a positive impact on profit bank. Based on this statement, the hypothesis developed is

H3b: Commission income has a positive effect on stability

H3c: Trading income has a positive effect on stability

H3d: Other non-interest income has a positive effect on stability

Based on the development and explanation of the hypothesis, the research framework can be described as follows:

H-Statistik

**H1**

Price

* Price DPK
* Price of Labor
* Price of Equity

Commission

Income

Diversity

Market Structure

Trading

Non Price

* Equity
* Credit
* Branch

**H3**

**H2**

Other Income

Banking Stability (Y)

(*Risk Taking Behaviour*)

**H3b**

**H3c**

**H3a**

Risk Insolven

(Z Score)

Non Performing Loan

Control Variables

* Capital Adequacy Ratio
* Operational Efficency

Figure 2 Research Framework

1. METHOD, DATA AND ANALYSIS

The type of data used in this study is panel data in the form of the number of commercial banks operating in Indonesia during 2014-2018. Using secondary data obtained through the annual financial statements of each bank, Indonesian banking statistics reports, journals and previous research. The objects studied were all commercial banks which were divided based on the category of book 4 to book 4. The sampling technique used the purposive sampling method with the criteria as shown in table 1.

Tabel 1 Jumlah Sampel Data

|  |  |
| --- | --- |
| Criteria | Amount |
| Commercial bank in Indonesia during operational 2014-2018 | 115 |
| Conventional of commercial bank | 107 |
| Incompleted financial reports & ratio | 28 |
| Number of final samples bank | **79** |
| BUKU 1 (Core capital < 1 trillion) | 18 |
| BUKU 2 (Core capital 1-5 trillion) | 33 |
| BUKU 3 (Core capital 5-30 trillion) | 23 |
| BUKU 4 (Core capital > 30 trillion) | 5 |
| Period of observation (Annual) | 5 |
| Number of observation | **395** |

**Measuring Competition**

The panzar rosse model is used to measure competition. This model defined the level of competition indicator with H-Statistic which is the amount of elasticity of bank income to the input price factor, so that if it is assumed that there are n-inputs used and the output produced by the bank is one, namely credit, according to Bikker et al. 2006 model equation of this PR is as follows:

LogR i  (1)

(2)

Dimana:

LogR : Revenue bank i

*W*i : Input Price bank i

CF : Input non price .

H : Level competition (H-statistik)

The value of H-statistics as a measure of competition is obtained from the sum of all the elasticity of the input factor prices (*W*i) to revenue bank (LogR) in the regression equation. The H-statistic value is between 0 and 1, the H-stat value below 0 indicates that the level of competition in an industry is collusive competition (joint monopoly). The H-statistical value of less than 1 indicates the level of competition in industry is monopolistic competition and the H-statistical value equal to 1 indicates the level of competition is perfect competition (Athoilah 2010).

The PR model provides the main assumption that the H-statistical test should be carried out in observing long-term equilibrium. In the long-run equilibrium the rate of return must not correlate with the input price variable (Hapsari 2019). Therefore, the value of ROA is used as the dependent variable, this is because ROA is a variable that describes the profitability of the company. The extent to which the bank can maximize profitability without being influenced by the cost increase factor. The equation for testing longrun equilibrium conditions as follows:

ln(1+ ROA) = (3)

(4)

Where::

LnROA : *Return on asset* bank i

*W*i : Input Price bank i

CF : Input non price.

E : Equilibrium long run (E-Statistik)

equilibrium test with Wald analysis with the interpretation that if E ≠ 0 the banking industry is not in equilibrium long run hile if the value of E-Statistics = 0 indicates the market is in a equilibrium long run, in other words, individuals in an industry have operate under optimal and stable conditions. Thus, the competition specification model as done by Hamza (2014), Nguyen (2017), Mustafa and Toçi (2017) on the panzer rosse model as follows:

Long run equilibrium test model

ln(ROAit) = β0 + β1 ln(PThirdPartyFundsit) + β2 ln(PLaborit) + β3 ln(PEquityit) +

Y1 ln(EQTAit) + Y2 ln(Creditit) + Y3 ln(Branchit) + D1 + D2 + D3 + D4 (5)

Competition analysis model

ln(TREVit) = β0 + β1 ln(PThirdPartyFundsit) + β2 ln(PLaborit) + β3 ln(PEquityit) +

Y1 ln(EQTAit) + Y2 ln(Creditit) + Y3 ln(Branchit) + D1 + D2 + D3 + D4 (6)

Tabel 2 Variabel Description

|  |  |
| --- | --- |
| Variable | Description |
| lnROA | Rasio *return on asset* bank |
| lnTREV | Interest Income to total aset |
| PThirdPartyFunds | DPK price proxy obtained (Interest Expence to Third Party Funds) |
| PLabor | (Cost Labor to total asset) |
| PEquity | Capital price input proxy (total biaya operasional di luar biaya tenaga kerja to asset) |
| EQTA | (equity to asset) |
| Credit | Credit to Aset |
| Branch | Number of branches bank i |
| D1 | Dummy Variable (BUKU 4) |
| D2 | Dummy Variable (BUKU 3) |
| D3 | Dummy Variable (BUKU 2) |
| D4 | Dummy Variable (BUKU 1) |

The value of the long run equilibrium test is obtained from the sum of the coefficients (E = β1+β2+β3) n the ROA equation, hile the coefficient value Y1+Y2 +Y3 is a control variable from input factors non-price. The value of level competition (H-statistics) is obtained from the sum of the coefficients (H = β1+ β2+β3) on the equation lnTREV,while the coefficient Y1+Y2 +Y3 is control variables for non-price input factors.

Table 3 Interpretation Result H Statistics

|  |  |
| --- | --- |
| **H- Statistik** | **Market Structure** |
| H ≤ 0 | Competitive Behaviour is in Line Eith Monopoly |
| 0 < H < 1 | Monopolistic Competition |
| H ≥ 1 | Perfect Competition |
| **E - Statistik** | **Market Condition** |
| E = 0 | Longrun Equilibrium |
| E ≠ 0 | The Market is in Dynamic Conditions |

Source: (Bikker and Haaf 2002)

The PR model examines the effect of changes in price input factors on the income earned banks. In other words, the PR model describes the elasticity of bank income to input prices. Basically, all banks will experience an increase in those banks. its marginal cost due to an increase in factor input prices. However, the reaction of each bank to these changes will be different depending on the type of market the bank has. According to Ventouri (2018), if the market conditions are in monopolistic competition, the increase in costs will lead to an increase in income at a lower rate than the increase in costs. In a perfectly competitive market, an increase in input prices which can increase marginal costs will force some firms out of the market so that the remaining firms will get an increase in demand which then leads to an increase in selling prices and hence the amount of revenue will be equal to the amount of the increase in costs. In a perfectly competitive market, banks are in a situation of zero profit, free entry and free exit. Meanwhile, in a monopoly or oligopoly market, an increase in the price of inputs will increase the marginal cost which leads to a decrease in output and consequently can reduce the level of income.

**Income Diversity**

In measuring diversification, following the research Lee et al. (2014), Abuyazed et al. (2018) and Trinugrogo et al. (2018) using the Herfindahl Hirshman Index measurement technique by exploring various types of income consisting of interest and non-interest. The two types of income make it possible to identify whether diversification activities can give to benefit by financial. Thee diversification measure equation as follows:

(7)

Where NII is *net interest income,* non is *non interest income*. following Fereira et al. (2019) the index value covers the range from 0.5 to 1. The value of the diversification index is equal to 0.5 then the bank's income is obtained in a balanced manner between interest and non-interest (maximum diversification). On the other hand, the diversification value is greater than or equal to 1, indicating that the level of diversification is only focused on one source (minimum diversification). In non-interest income, there are also three types of income, namely commission income, trading income, and other non-interest income. Similarly, the research of Bustaman et al. (2017) and Brunnermeier et al. (2020) calculates the value of commission, trading and other non-interest income which is calculated based on the respective value to total assets.

**Stability**

For measuring stability, we use the NPL and Z-score as suggested and commonly used in banking literature (Lepetit et al. 2008;Laevenand Levine, 2009;Cihak and Hesse, 2007,2010;Ibrahim *et al*. 2018;Louhichi *et al*. 2018). The NPL ratio is calculated as the ratio of bad loans to total loans. This analysis makes it possible to understand whether competition has an impact on bank behavior in taking risks through credit, as measured by the level of non-performing loans. In addition to NPL, insolvency risk is calculated as a proxy for a measure of bank stability. Insolvency risk is calculated by the Z-score which is a measure of health by combining the capital and profit of a bank for the risks faced. The Z score can also be considered as a measure of a bank's distance to default, because it calculates the standard deviation of earnings that continues to fall, pushing banks into bankruptcy (Shim 2019). As used also by Nguyen et al. (2012), Amidu and Wolfe (2013) Z score is calculated using the following equation:

(8)

Where ROAit is the return on assets for bank i at time t. CARit is the amount of equity to assets ratio of bank i at time t. ROAit is computed as the standard deviation of return on assets within each individual bank time t.

After obtaining the measures of competition, income diversification and stability, we run the regression specification model of competition, income diversification and stability as follows:

(Stabilityit) = β0 + β1 Competitionit + β2 DIVit + β3 Commit + β4Tradit + β5Oth +

Β6 CARit + β7BOPOit + eit (9)

Stability is a measure of risk measured by two proxies, namely credit risk (NPL) and insolvency risk, competetition is a measure of the bank's market structure, div is the level of diversification of bank income between interest and non-interest, comm is commission, trad is non-interest trading income , and other non-interest. The control variables at the bank level used include the capital ratio and the level of efficiency.

1. RESULT

**Competition in Banking Industry Indonesia**

The use of the panzar rosse model in measuring industrial competition requires the assumption of a necessary condition. Where the observation sample as a whole must be in a state of long run equilibrium. This test is carried out by the Wald test by adding up the value of the E-statistical coefficient of the price input variable to LN (ROA) which is the dependent variable as shown in table 4.

Tabel 4 Equilibrium test

|  |  |  |
| --- | --- | --- |
| E-statistics | Prob F-stat (*wald test*) | Market Condition |
| -0.0009 | 0.6778 | The industry is in long-run equilibrium |

Source: Data Processed, 2020

The results of the Wald test show that the industrial market is in a long-run equilibrium condition. This can be seen from the probability value of 0.6778. it can be interpreted that any increase in the price of production inputs will have a minimum or even no effect on the profitability (Ventouri 2018).

In the competitive structure of the Indonesian banking market, we use a panel data regression analysis model with the Feasible Generalized Least Square (FGLS) model. The choice of the FGLS model is due to the fact that in the selection of the fixed effects model there is a violation of the autocorrelation assumption, so it needs to be overcome by generalizing with the Generalized Least Square (GLS) model. In addition, the consideration of dummy variables in the regression allows for full multicollinearity or near singular matrix in the fixed effects model which results in the estimation not being able to be carried out. The results of the estimation of the competitive structure of the banking market are shown in table 5 as follows:

Tabel 5 Regression Test Market Structure

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Independent  Variable | Dependent Variable (Total Revenue) | | | |
| **OLS** | **FEM** | **GLS** | **FGLS** |
| lnP\_DPK | 0,1601\*\*\*  (0,0000) | 0,1032\*\*\*  (0,0000) | 0,1178\*\*\*  (0,0000) | 0,1004\*\*\*  (0,0000) |
| lnP\_Labor | 0,0653\*\*\*  (0,0000) | 0,0050  (0,7008) | 0,0236\*  (0,0514) | 0,0194  (0,1153) |
| lnP\_Equity | 0,2368\*\*\*  (0,0000) | 0,1236\*\*\*  (0,0000) | 0,1696\*\*\*  (0,0000) | 0,1774\*\*\*  (0,0000) |
| lnEQTA | -0,0021  (0,9377) | 0,0157  (0,5782) | 0,0116  (0,6502) | 0,0110  (0,6692) |
| lnCredit | 0,0452  (0,4491) | 0,1467\*\*  (0,0143) | 0,1124\*\*  (0,0398) | 0,1168\*\*  (0,0321) |
| lnBranch | 0,0050  (0,4767) | -0,0079  (0,8033) | 0,0084  (0,4547) | 0,0365\*\*  (0,0101) |
| Cons | -0,6563  (0,0000) | -1,3603  (0,0000) | -1,1616  (0,0000) | -1.2268  (0,0000) |
| H-statistik |  |  |  | **0,2748** |
| Group Bank | | | | |
| D1\_BUKU 4 |  |  |  | -0,3540\*\*\*  (0,0050) |
| D2\_BUKU 3 |  |  |  | -0,1324  (0,2604) |
| D3\_BUKU 2 |  |  |  | -0,0827  (0,4946) |
| D4\_BUKU 1 |  |  |  | 0,0065  (0,9587) |

Noted: \*\*\*Signifikant 1%,\*\*Signifikant 5%,\*Signifikant 10%

Source: Data Processed, 2020

Based on the estimation results, the value (H-statistics) was obtained at 0.2748. This value is obtained from the number of coefficients on the price input variable which is significant. Referring to table 3, it is generally known that Indonesian banks operate under monopolistic competition.

The price factor variable, namely the price of TPF and the price of capital, is the most significant value in influencing income. This shows that an increase in the cost of TPF and the cost of capital can lead to an increase in bank income by 0.1004% (dpk price) and 0.1774% (capital price). Meanwhile, viewed from non-price factors partially the variables that have a significant influence on income are the number of credits and the number of bank branch offices. Higher credit delivery and number of office services can lead to revenue of 0.1168% (credit) and 0.0365% (branch).

In dummy variable, it shows that there are differences from the bank group, especially in BUKU 4 large bank group with a significant negative coefficient. This allows competitive behavior that can lead to oligopoly.

ncome diversification, which is a non-traditional activity, is carried out as an effort to compensate for the decline in income generated from traditional activities. Table 6 shows that banks in Indonesia on average diversify their income, which is still relatively small or equal to 25.7% of the total income. The non-interest income earned is mostly generated from commission income followed by trading and other non-interest.

Tabel 6 Income Diversification and Stability

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Years** | **Div** | **Comm** | **Trading** | **Other** | **Stability (Risk)** | |
| **NPL** | **Z-Score** |
| 2014 | 0.249 | 0.084 | 0.059 | 0.037 | 2.36 | 61.87 |
| 2015 | 0.248 | 0.077 | 0.064 | 0.038 | 2.72 | 63.98 |
| 2016 | 0.251 | 0.072 | 0.069 | 0.040 | 3.17 | 68.77 |
| 2017 | 0.266 | 0.076 | 0.072 | 0.044 | 3.16 | 68.72 |
| 2018 | 0.272 | 0.077 | 0.077 | 0.054 | 3.06 | 66.66 |
| Average | 0.257 | 0.077 | 0.068 | 0.043 | 2.89 | 66.00 |

Source: Data Processed, 2020

In addition, in terms of stability as measured by two proxies for NPL risk and insolvency (Z Score) it shows that the average NPL risk of commercial banks tends to increase, especially in 2014-2016 and then declines again in 2017 and 2018. However, despite the trend increase, the overall value of NPL is still below the maximum limit of 5%. Meanwhile, the average value of Z Score for commercial banks is 66.00, which indicates the level of stability in terms of insolvency risk tends to be better than in 2014-2016. This is caused by the increase in the bank's capital ratio (CAR) which is used as an effort to cover losses that may be obtained due to the tendency of increasing NPLs. It can also change direction in the opposite direction.

The results of our estimation of the NPL variable use the Feasible Generalized Least Square (FGLS) regression model for the fixed effect estimator, this is because of the autocorrelation in the selection of the fixed effect model. Partially, the H-statistical variable as a measure of competition has a significant negative effect on the level of NPL with a coefficient value of -0.2334. This shows that relatively low competition is characterized by higher market power which can reduce the occurrence of bank risk taking in terms of offering credit. Meanwhile, the CAR and BOPO variables have a significant positive effect on NPL. This means that CAR can encourage banks to expand their business, in this case, lending. The greater the amount of credit disbursed, the higher the risk of loss will be. BOPO variable is a measure of efficiency, has a positive effect on NPL. One of the components of banking BOPO is the interest rate. The amount of the interest rate that is set will reduce the borrower's ability to pay its obligations, so that this condition can result in high risk.

Tabel 7 *Regression Test*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variabel Independen | NPL | | Z-Score | |
| ***Coeffisient*** | ***Prob.*** | ***Coeffisient*** | ***Prob.*** |
| C | -0.1179 | 0.6909 | 0.2575 | 0.0293 |
| Competition | -0.2334\*\*\* | 0.0004 | 0.0898\*\*\* | 0.0001 |
| Income Diversification | -0.2586 | 0.7163 | -0.1246 | 0.4025 |
| Commission | -0.4484 | 0.6276 | 0.2390 | 0.2165 |
| Trading | -0.7735 | 0.2612 | 0.1113 | 0.2612 |
| Non Interest Other | 0.9289 | 0.3768 | 0.5062\*\* | 0.0262 |
| CAR | 0.3767\*\*\* | 0.0001 | 1.1163\*\*\* | 0.0000 |
| BOPO | 0.5248\*\*\* | 0.0000 | -0.1780\*\*\* | 0.0000 |
| Model Regression | GLS *Cross-section weights* | | GLS *Cross-section random effects* | |
| R-squared | 0.9091 | | 0.9420 | |
| Adjusted R-squared | 0.8841 | | 0.9410 | |
| F-statistic | 36.3540 | | 897.9627 | |
| Prob(F-statistic) | 0.0000 | | 0.0000 | |

Noted: \*\*\*Signifikant 1%,\*\*Signifikant 5%,\*Signifikant 10%

Source: Data Processed, 2020

Insolvency risk (Z Score) shows that competition has a significant positive effect with a coefficient of 0.0898. The greater market power (low competition) can make commercial banks avoid the problem of insolvency risk. These results are in line with the research of Louhichi *et al*. (2018) which analyzes Tunisian banking competition concludes that low competition characterized by high market power can encourage banks to protect against bank risk-taking behavior in terms of lending which has an impact on high non-performing loans so that this contributes to banking stability.

Income diversification have no effect on Z Score. However, if see on diversification classification, non-interest income has a significant positive effect. The CAR variable has a positive effect. CAR is a measure of bank capital that is used as a buffer against the risk of loss, especially when there is an increase in credit. The larger the CAR, the better the bank's ability to manage risk, which will have an impact on stability. The BOPO variable has a significant negative effect on the Z Score. This shows that banks with low levels of efficiency tend to have low levels of profit as well. This is because the intermediation function through the collection and distribution of a number of funds does not work effectively. The greater the operating expenses incurred, the greater the impact on the bank's income so that this will also have a negative impact on the level of stability of a bank.

1. DISCUSSION

The results of this study indicate that the condition of banking competition in Indonesia is in a monopolistic condition. In a monopolistic market an increase in the cost of production inputs can increase income at a lower rate than the increase in input prices. In other words, in monopolistic competition market conditions, when viewed from the behavior of banks in responding to changes in input prices, every 1% increase in input prices will increase income output below it's proportional value (Mayasari 2012). Furthermore, in this market, there are several characteristics, including relatively many producers selling almost similar products, the existence of product differentiation offered from each bank, in other words, a bank sells products slightly different from other banks and is free to enter. Firms can enter (or exit) the market without any restrictions (Mankiw, 2011). However, in the long term it is possible for new banks to enter the industry due to the lack of barriers to entry. In addition, from a price point of view, commercial banks in Indonesia are price makers and not price takers, resulting in a high price elasticity of demand. The ability of banks will be to equal because demand for products is faced with high price elasticity. This means that in order to increase prices, product differentiation is needed from its competitors, especially in terms of benefits and quality (Harkati et al. 2020).

However, if viewed based on the classification of bank groups, it shows that there is behavior that tends to lead to oligopoly conditions, especially in BUKU 4. Where in oligopoly an increase in input prices will increase marginal costs which result in a decrease in output and income. In addition, this fact also shows that the BUKU 4 bank group consists of only five major banks including BRI, Mandiri, BCA, BNI and CIMB Niaga. The five banks in total control half of the banking market both in terms of credit, deposits and assets from a total of 115 banks.

The results of the estimation of competition on stability as measured by two risk proxies indicate that competition has a significant effect on stability. This research fully supports the paradigm of competition fragility hypothesis (concentration stability) for the condition of Indonesian banking. Where banks with large market power will have a stronger bargaining position, making it more likely to obtain high profits. When it succeeds in making a profit, the bank tends to be careful in carrying out its business activities so that this can reduce the occurrence of credit risk which has an impact on the better stability of the bank (Wibowo, 2017).

Income diversification is known to have no effect on Stability (Z Score). However, if see from diversification classification, non-interest income has a positive effect. This is because the income generated from services is a supporting activity that is relatively risk-free, so that financially it can provide benefits.

1. CONCLUSION

his study was conducted to prove empirically related to competition structure of banking and risk in Indonesia during the period 2014 – 2018. Based on the results obtained, it can be concluded that the structure of banking competition in Indonesia is generally in a condition of monopolistic competition. In addition, the results of this study also support the view of the competition fragility hypothesis, where low competition is characterized by a tendency to increase market concentration from 2014-2018 can affect bank behavior in taking smaller risks, this is indicated by the effect of negative NPL. The smaller the NPL ratio will directly have an impact on the better insolvency risk. In conditions of relatively less competitive competition, banks need to increase income diversification, particularly in non-interest income. This is because non-interest income can provide benefits to the continuity of the bank's business. In addition, banks also need to constantly maintain or increase the level of capital and efficiency in accordance with the standard limits set by the OJK.

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