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DOES THE PRUNING ON THE REFERENCE INTEREST RATE BY BANK INDONESIA INFLUENCE INTEREST RATE SENSITIVITY TOWARDS BANKING NET INTEREST MARGIN DURING EARLY PERIOD IN FACING COVID-19 IN INDONESIA?

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ABSTRACT

On March 2, 2020, Indonesian citizens tested positive for Coronavirus Disease (COVID-19) for the first time, making Indonesia the start of facing various problems in the health and economic sectors. All ministries or agencies are mitigating it using the extraordinary policy which adapts to the rapid growth in the number of positive patients for COVID-19 in Indonesia, including Bank Indonesia by gradually lowering the Reference Interest Rate, causing changes in the Interest Rates Sensitivity (Asset or Liability) Banking. It should be noted

that interest income contributes greatly to the income of a bank. Based on this, this study aims to test whether the Bank Indonesia policy affects the Banking Net Interest Margin during the first four months since the detection of the first positive case of COVID-19 in Indonesia. By using Multiple Linear Regression Analysis, this paper concludes that changes in the reference interest rate made by Bank Indonesia in the face of the impact of the COVID-19 Pandemic strongly affects the Rate of Fixed / Sensitive Assets and Liabilities to the ratio of Net Interest Margin (NIM). Where the correlation is strong. This shows that changes in the Reference interest rate carried out by Bank Indonesia must be carried out gradually and carefully so as not to cause major changes to banking performance during the face of the COVID-19) Pandemic in Indonesia.

Keywords: Interest Rate Sensitivity, Net Interest Margin, COVID-19, and Bank Indonesia.

INTRODUCTION

The importance of Indonesian State institutions in mitigating any problem that threatens the sovereignty of its people, both health sovereignty and economic sovereignty, is a must. Today, a threat to State sovereignty comes from an invisible creature, namely Coronavirus Disease (COVID-19). Coronaviruses are a large family of viruses that can cause disease in animals or humans. Covid-19 is an infectious disease caused by the newly discovered Corona virus. These new viruses and diseases were unknown before the outbreak began in Wuhan, China, in December 2019 (World Health Organization, 2020).

On Monday (2/3/2020), President Joko Widodo announced the confirmation of the first positive case of Coronavirus Disease (COVID-19) in Jakarta. Positive cases of COVID-19 continue to grow rapidly and result in public health in danger and disruption of Indonesia's economic conditions, until

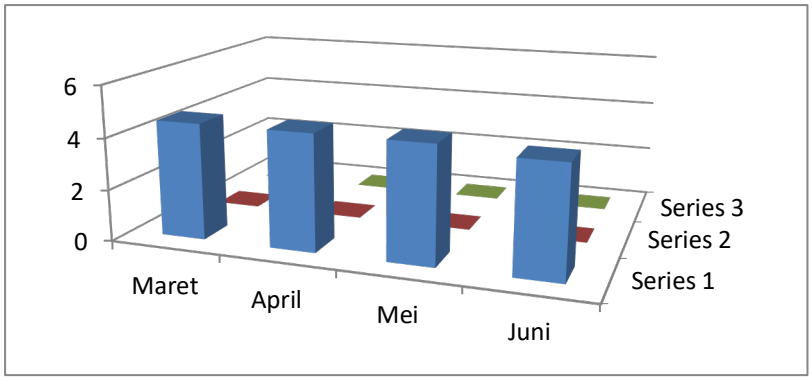
now, Friday (18/9/2020), positive cases of Covid-19 have reached 236,519 with a death toll of 9,336 and a cure rate of 170,774 (Task Force for Handling COVID-19, 2020). As a result, the health, education, and community economy sectors were disrupted.

This also caused the country's Gross Domestic Product (GDP) to experience a decline and even experienced a contraction in the second quarter of -1.88% on a Q to Q basis and -1.74% on a Y on Y basis (Central Statistics Agency, 2020). In addition, other sectors affected are the flow of foreign capital, the inflow of foreign capital (especially investment) will be followed by an appreciation of the exchange rate and in the long run, if the investment is successful in increasing the productivity and competitiveness of local products, it is expected that exports will increase, so that in the end long-term exchange rate appreciation will occur (Endy and Hendy, 1998: 208). Banks also have reacted to the challenges posed by the new operating environment by creating new products and expanding their activities to some uncharted business areas (Papanikolaou and Wolff, 2014: 1).

Facing this condition and to prevent various kinds of risks in the future, all state institutions work together to face the impact of the COVID-19 Pandemic in Indonesia, both on health, education and the economy. Such as the Equity Risk Premium (ERP) in BRIC markets is, on average, significantly higher than that in the US market (Curatola, et al., 2015: 65). Bank Indonesia as a central bank and independent state institution that maintains financial system stability as well as a state institution that supports macroeconomic stability and economic growth in Indonesia, (Bank Indonesia, 2013), issued a policy by gradually lowering the benchmark interest rate (BI7DRRR) in the face of the impact of the COVID-19 Pandemic. In the first month of detection of positive cases, Bank Indonesia lowered the BI 7 Days Reverse Repo Rate (BI7DRR) by

25 bps to 4.50% at the Board of Governors Meeting (RDG) in facing the risk of the impact of COVID-19 on March 18, 2020 (Bank Indonesia, 2020). Bank Indonesia gradually lowered its benchmark interest rate from month to month.

Table 1. BI7DRRR



This change inevitably causes changes in the interest rate for Bank Indonesia Certificates (SBI) and the interest rate on Money Market Securities (SBPU), which is one of the calculations for determining fair interest rates based on the Open Market Operation Approach to determine the amount of Interest Rate Sensitivity (Assets / Liability). Riyadi, 2004: 136).

Interest Rate Sensitive (Assests / Liability) is a matter that affects the Bank's performance in terms of interest income by knowing the amount of Net Interest Margin (NIM). NIM is the difference between interest income derived from bank credit and other asset income and the interest cost paid to depositors (Raharjo and Hakim, 2014: 296). Because the income of most banks comes from interest income. If there is a decrease in the benchmark interest rate, it is possible that or not it will affect bank interest income, given the size or size of the bps cut by BI. This is urgent because it can have a systemic impact if the bank cannot deal with it, especially during the COVID-19 Pandemic.

The economy needs an institution that functions as an intermediary (financial intermediary) in channeling funds. One type of institution is a bank (Dasih, 2019: 4). Banks as agents of development and agent of intermediate play an important role in building the country's economy in the financial sector. If this decline has a major impact on NIM and the performance of other banks, it will also have an impact in hampering the Indonesian economy. Because the bank as a place for payment transactions can be disrupted by starting to weaken bank performance due to various things. A shaky bank track record from the start can illustrate how conceptually a superior payment platform could fail (Roberds, 2016: 14). Therefore, to deal with these risks, it is necessary to have good mitigation planning and periodic evaluations regarding the policy of rising / falling Reference Interest Rates decided by Bank Indonesia. Because that banks with more risky loans and higher interest-rate risk exposure would select loan and deposit rates to achieve higher net interest margins (Angbazo, 1997: 55).

Based on this background, this study aims to determine the effect of Interest Rate Sensitivity on the Net Interest Margin (NIM) of Banks due to Bank Indonesia gradually cutting its Reference Interest Rates during the initial period facing Coronavirus Disease (COVID-19) in Indonesia.

THEORETICAL REVIEW

BI 7-Days Reverse Repo Rate (BI7DRRR)

BI7DRRR is used as a new policy interest rate because it can quickly influence the money market, banking, and real sector. The BI 7-Days Reverse Repo Rate instrument as a new reference has a stronger relationship to money market interest rates, is transactional, or traded in the market, and encourages financial market deepening, particularly the use of repo instruments (Bank Indonesia, 2013). In China, based on the results of Hou et al., (2014: 1) suggest

that banks can realize more scale economies by increasing OBS (role of off-balance sheet) operations and that scale economies can be reaped particularly for non-state-owned banks. Therefore, diversification and deregulation should be included in the policy agenda for the subsequent marketization reform of China's banking sector.

Interest Rate Sensitivity

This interest rate greatly affects the Bank's performance based on its effect on the bank's earning assets and liabilities. When there is a change in interest rates, banks can control interest rate risk by matching the maturity of assets and maturity of liabilities (Rokhmawati, 2019: 22).

With large changes in interest rates, it can change the Bank's performance if the Bank's management is unable to perform Gap management and if Bank Indonesia does not make the right decision to change the benchmark interest rate The classification of Sensitive Asset / Liability is based on a relatively short placement period, changes in interest rates will have a direct effect on assets / liabilities included in this group. If the placement period exceeds 1 year and uses a fixed rate, it is grouped into Fixed Rate Assets / Liabilities (Riyadi, 2004: 134).

Table 2. Classification of Fixed and Sensitive Rate Assets / Liabilities

No	Sensitive Asset	Fixed Rate Asset	Sensitive Liabilities	Fixed Rate Liabilities
1	Call Money	Long Term Loan	Time deposit	KLBI
2	SBPU	-	Call money	-
3	SBI	Investment	Other immediate obligations	Own funds

According to Riyadi (2004: 135) various approaches to determining a reasonable interest rate can be done in the following ways: 1) Interest Differential Approach, 2) Real Interest Rate Approach, 3) Open Market

Operation Approach, and 4) Market, namely the rate interest offered by other banks.

Indicator	Explanation
Interest Differential Approach	Namely an approach using a comparison of interest rates prevailing at home and abroad.
Real Interest Rate Approach	This approach uses the rate of inflation and Gross Domestic Product (GDP) which shows the decrease / increase in the value of money and the excitement / sluggishness of investment in a country.
Open Market Operation Approach	Namely the determination of the interest rate using an approach that refers to the deposit interest rate that is between the rate of Bank Indonesia Certificates (SBI) and Money Market Securities (SBPU).

Net Interest Margin (NIM)

The increase in NIM will result in increased bank stability (Yudaruddin, 2019: 5). The higher the NIM, the more effective the bank is in placing productive assets in the form of credit and other forms of credit, in fact, when the NIM shows a minimum percentage, there will be a tendency for problem loans to emerge, in this case it will increase the Non-Performing Loan / NPL ratio.

The presence of regret aversion raises or lowers the optimal bank interest margin than the one chosen by the purely risk-averse bank, depending on whether the probability of default is below or above a threshold value, respectively (Wong, 2011: 2483). The net interest margin ratio shows the ratio of bank interest income to outstanding credit, this ratio shows the bank's ability to obtain operating income (Usman, 2003: 74). The NIM calculation is as follows:

$$\text{NIM} = \frac{NET\ INTEREST\ INCOME}{RATA{-}RATA\ ASET\ PRODUKTIF} \text{ X } 100\%$$

Net Interest Income (NII) = Total Interest Income – Total Interest Cost.

RESEARCH METHODOLOGY

Operational Definition of Variables

Independent variables (x) used in this study are Rate Sensitive and Fixed Rate) used for Assets and Liabilities according to the category of time period. Meanwhile, the Net Interest Margin (NIM) (y) in this study is the dependent variable. Rate sensitive is used to influence the value of earning assets and short-term liabilities. Meanwhile, for the long term using the Fixed Rate. This is done by multiplying the rate sensitive interest rate by the Rate Sensitive Assets / Liabilities, and Fixed Rate Assets / Liabilities.

Type of Data

Secondary data is data used by researchers, which comes from official data from state institutions and financial reports of the bank concerned. This is to determine whether the gradual change in the benchmark interest rate by Bank Indonesia will result in Rate Sensitive changes, and whether it will affect the NIM of banks. The bank we use as a sample is PT. Bank BRI Tbk and PT. Bank BNI Tbk is based on a random representative from a list of companies, especially in the financial sector that have high liquidity and good bank performance (LQ45), seen from the Bank's Financial Statements for the first four months of detection of positive cases of Coronavirus Disease (COVID-19). The interest rates used are derived from Bank Indonesia data using the OMOA fair interest rate approach.

Multiple Linear Regression Analysis

Multiple regression analysis is used to overcome this problem, namely by using several independent variables in a regression model (Mahampang, 2020: 197). Multiple regression is used to test the linear relationship between 1 dependent variable (y) and more than one independent variable. Here is a general form of multiple regression models.

$$y = b_0 + b_1x_1 + b_2x_2 + \ldots + b_kx_k + \text{e}$$

Where k is the number of independent variables (x) used in regression analysis, is a constant (intercept), $b_0 b_1 b_2 \ldots . b_k$ is the regression coefficient for $x_0 x_1 x_2 \ldots . x_k$ techniques for determining the value of the coefficient $b_0 b_1 b_2 \ldots . b_k$ as in simple linear regression analysis, namely the OLS method.

While this study only uses two independent variables ($x_1 dan\, x_2$), the regression model is as follows.

$$y = b_0 + b_1 x_1 + b_2 x_2 + \text{e}$$

Meanwhile, the value $b_0 b_1\, dan\, b_2$ can be determined by the following formula.

$$b_1 = \frac{(\sum x_2^2)(\sum x_1 y) - (\sum x_2 y)(\sum x_1 x_2)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

$$b_2 = \frac{(\sum x_1^2)(\sum x_2 y) - (\sum x_1 y)(\sum x_1 x_2)}{(\sum x_1^2)(\sum x_2^2) - (\sum x_1 x_2)^2}$$

$$b_0 = \frac{(\sum y - b_1(\sum x_1) - b_2(\sum x_2))}{n}$$

The formula for determining the coefficient of determination on multiple linear is as follows.

$$r^2 = \frac{b_1\ (\sum x_1 y) + b_2\ (\sum x_2 y)}{\sum y^2}$$

Under the condition:

$$\sum x_1^2 = \sum x_1^2 - \frac{(\sum x_1)^2}{n} \qquad \sum x_1 y = \sum x_1 y - \frac{(\sum x_1)(\sum y)}{n}$$

$$\sum x_2^2 = \sum x_2^2 - \frac{(\sum x_2)^2}{n} \qquad \sum x_2 y = \sum x_2 y - \frac{(\sum x_2)(\sum y)}{n}$$

$$\sum y^2 = \sum y^2 - \frac{(\sum y)^2}{n} \qquad \sum x_1 x_2 = \sum x_1 x_2 - \frac{(\sum x_1)(\sum x_2)}{n}$$

Thus, the multiple correlation coefficient (r) can be calculated as follows.

$$\text{r} = \sqrt{r^2}$$

The multiple correlation coefficient (r) is usually greater than the individual correlation coefficient. Test the significance of the coefficient of determination (r^2) often using the F test (F distribution), as follows.

$$f_{hitung} = \frac{(r^2/k)}{(1-r^2)/(n-k-1)}$$

Where n is the number of data groups ($x_1 x_2 \ldots . y$) and k is the number of independent variables (x). Hypothesis decisions are taken by comparing the

values of f_{htung} and f_{tabel} . the values of f_{tabel} is seen based on the F (Fisher) distribution table with the denominator (dk_1) = n-k and the numerator's degrees of freedom (dk_2) = n-k-1 (Mahmudah, 2020: 200). Then the hypothesis is:

H_0 : There is no significant effect between the independent and dependent variables

H_1 : There is a significant effect between the independent and dependent variables

RESULTS AND DISCUSSION

Rate sensitive Assets / Liabilities (RSA / RSL) are all bank assets / liabilities that are sensitive to changes in interest rates (Riyadi, 2004: 133). The benchmark interest rate, which serves as a barometer of other interest rates, has been gradually trimmed by Bank Indonesia during the first four months that the country faced Coronavirus Disease (COVID-19).

Although the changes were slight, other interest rates also experienced slight changes following the benchmark interest rate. By using the Open Market Operation Approach to determine the fair interest rate which refers to the deposit interest rate that is between the rate of Bank Indonesia Certificates (SBI) and Money Market Securities (SBPU) (Riyadi, 2004: 136). In Nigeria Banks, deposit interest rate is found to be negative but insignificant while lending interest rate has positive and significant influence on banks profitability (Gbadebo and Ogbonna, 2020: 10). The following data (Bank Indonesia, 2020)

Table 4. Open Market Operation Results (%)

Period of time	SBI	SBPU	Fair interest rates
i. 6 months	4.57	4.8	4.71
ii. 12 months	4.75	4.9	4.825
i. 6 months	4.56	4.8	4.705
ii. 12 months	4.72	4.9	4.81
i. 6 months	4.565	4.8	4.7025
ii. 12 months	4.65	4.88	4.765
i. 6 months	4.314	4.57	4.442

ii. 12 months	4.335	4.6	4.4675

To calculate the bank's net interest income, it is important to know the amount of interest income and interest expense, respectively. To determine these two things, the fair interest rate is multiplied by the respective postal assets classified as Rate Sensitive Assets / Liabilities and Fixed Rate Assets / Liabilities from the Monthly Financial Statements of PT. Bank BRI Tbk and PT. Bank BNI Tbk during the first four months of the announcement of positive COVID-19 cases which are available in the following table.

Table 5. PT. Bank Negara Indonesia (BNI) Tbk. (millions)

Month	Rate Fixed/Sensitive Assets	Rate Fixed/Sensitive Liabilities
March	24,323,292.5	19,087,622.2
April	24,429,051.5	4,974,681.91
May	24,907,204.6	4,630,575.35
June	24,092,193	3,971,117.73

Table 6. PT. Bank Rakyat Indonesia (BRI) Tbk. (millions)

Month	Rate Fixed/Sensitive Assets	Rate Fixed/Sensitive Liabilities
March	24,579,768.4	6,326,085
April	44,617,787.8	26,579,518
May	45,703,137.2	5,730,043.78
June	43,287,165.8	5,013,720.48

After each data is known, the financial data for each month of the two banks is calculated using a fair interest rate using the Open Market Operation Approach. So that the respective interest income and interest costs of the two banks will be obtained along with their net interest income for the first four months. Net Interest Margin is calculated based on this data, so that the Net Interest Margin of the two banks will be obtained as follows:

Table 7. Net Interest Margin Results

Name of Bank	March	April	May	June
PT. Bank BRI Tbk.	3.939%	3.865%	8.300%	7.885%

PT. Bank BNI Tbk.	7.523%	7.615%	10.931%	7.449%

Multiple Linear Regression Analysis

Based on the data processing, it will be grouped as follows

Table 8. PT. Bank BNI Tbk.

No.	Name / Month	3	4	5	6
1	Rate Sensitive (x_1)	4.71%	4.705%	4.7025%	4.442%
2	Fixed Rate (x_2)	4.825%	4.81%	4.765%	4.4675%
3	NIM (y)	7.523%	7.615%	10.931%	7.449%

Table 9. PT. Bank BRI Tbk.

No.	Name / Month	3	4	5	6
1	Rate Sensitive (x_1)	4.71%	4.705%	4.7025%	4.442%
2	Fixed Rate (x_2)	4.825%	4.81%	4.765%	4.4675%
3	NIM (y)	3.939%	3.865%	8.300%	7.885%

This shows that the fair interest rate will change according to the reference interest rate cut by Bank Indonesia and the Net Interest Margin of the two banks has also changed during the first four months.

The following is a helper table for moving value calculations $b_0 b_1 \, dan \, b_2$.

Table 10. PT. Bank BNI Tbk. (%)

The month	x_1	x_2	y	x_1^2	x_2^2	y^2	x_1x_2	x_1y	x_2y
3	4.71	4.825	7.523	22.184	23.280	56.595	22.725	35.433	36.298
4	4.705	4.81	7.615	22.137	23.136	57.988	22.631	35.828	36.628
5	4.7025	4.765	10.931	22.113	22.705	119.486	22.407	51.397	52.086
6	4.442	4.4675	7.449	19.731	19.958	55.487	19.844	33.088	33.278
Amount	18.559	18.867	33.518	86.165	89.079	289.556	87.607	155.746	158.290

Then,

$\sum x_1^2 = 86.165 - \frac{18.559^2}{4} = 0.056$ $\sum x_1y = 155.746 - \frac{18.559 \, x \, 33.518}{4} = 0.231$

$\sum x_2^2 = 89.079 - \frac{18.867^2}{4} = 0.089$ $\sum x_2y = 158.290 - \frac{18.867 \, x \, 33.518}{4} = 0.194$

$\sum y^2 = 289.556 - \frac{33.518^2}{4} = 8.692$ $\sum x_1x_2 = 87.607 - \frac{18.559\ x\ 18.867}{4} = 0.069$

The coefficient value is:

$b_1 = \frac{0.0192}{0.0002} = 96$

$b_2 = \frac{-0.0279}{0.0002} = -139.5$

$b_0 = \frac{-1266.9}{4} = -316.7$

Based on these data, the multiple linear regression model is as follows.

$$y = -316.7 + 96x_1 - 139.5x_2 + e$$

Value interpretation of b_0, b_1, b_2, in the regression model is the same as in a simple linear regression model (Mahampang, 2020: 202). While the value of the multiple determination coefficient (r^2) is:

$$r^2 = \frac{5.25}{8.692} = 0.604$$

This shows that about 60% of the two independent variables used in this study, namely Rate Sensitive and Fixed Rate, can explain variations in the bank's Net Interest Margin. And the value of the multiple correlation coefficient (r) is:

$$r = \sqrt{0.604} = 0.78$$

Which means that the correlation between the three variables is strong. Then, the significance test on the coefficient of determination (r^2) is:

$F_{hitung} = \frac{0.604/2}{1-0.604/1} = 0.78$

F_{tabel} = 18.51 x % = 0.18

$F_{hitung} > F_{tabel}$, maka keputusan uji hipotesis adalah menolak H_0.

Table 11. PT. Bank BRI Tbk. (%)

The month	x_1	x_2	Y	x_1^2	x_2^2	y^2	x_1x_2	x_1y	x_2y
3	4.71	4.825	3.939	22.184	23.280	15.515	22.725	18.552	19.005
4	4.705	4.81	3.860	22.137	23.136	14.899	22.631	18.161	18.566
5	4.7025	4.765	8.300	22.113	22.705	68.89	22.407	39.03	39.549
6	4.442	4.4675	7.885	19.731	19.958	62.173	19.844	35.025	35,226

Amount	18.559	18.867	23.984	86.165	89.079	161.477	87.607	110.768	112.346

$\sum x_1^2 = 86.165 - \frac{18.559^2}{4} = 0.056$ $\sum x_1 y = 110.768 - \frac{18.559 \, x \, 23.984}{4} = -0.51$

$\sum x_2^2 = 89.079 - \frac{18.867^2}{4} = 0.089$ $\sum x_2 y = 112.346 - \frac{18.867 \, x \, 23.984}{4} = -0.78$

$\sum y^2 = 161.477 - \frac{23.984^2}{4} = 17.669$ $\sum x_1 x_2 = 87.607 - \frac{18.559 \, x \, 18.867}{4} = 0.069$

The coefficient value is:

$b_1 = \frac{0.00852}{0.0002} = 42.6$

$b_2 = \frac{-\,0.00841}{0.0002} = -\,42.05$

$b_0 = \frac{26.728}{4} = 6.682$

Based on the data above, the multiple linear regression model is as follows.

$$y = 6.682 + 42.6x_1 - 42.05x_2 + e$$

While the value of the multiple determination coefficient (r^2) using the values above is as follows.

$$r^2 = \frac{11.073}{17.669} = 0.626$$

So about 62% of the two independent variables can explain variations in the performance of the NIM of PT. BRI Tbk. With the multiple correlation coefficient (r) as follows:

$$r = \sqrt{0.626} = 0.791$$

Based on this, the correlation between the three variables is strong. Then, the significance test is carried out on the coefficient of determination (r^2) with the following results:

$F_{hitung} = \frac{0.626/_2}{1-0.626/_1} = \frac{0.313}{0.374} = 0.836$

$F_{tabel} = 18.51\ (\%) = 0.185$

Due $F_{hitung} > F_{tabel}$ then the hypothesis decision is to reject H_0.

Based on this hypothesis, Bank Indonesia's decision to lower the reference interest rate in order to deal with the impact of the Coronavirus Disease (COVID-19) pandemic strongly affects the Fixed / Sensitive Rate on the Net Interest Margin (NIM) of the two banks.

CONCLUSION

The main purpose of writing this paper is to test whether Bank Indonesia's decision to cut its reference interest rate in the face of the Coronavirus Disease (COVID-19) pandemic will affect its Rate Sensitive Assets or Liabilities and Fixed Rate on bank performance, based on its Net Interest Margin (NIM) ratio. . Researchers conducted random sampling on a list of banking companies including members of the LQ45, and obtained 2 samples, namely PT. Bank Rakyat Indonesia (BRI) Tbk. and PT. Bank Negara Indonesia (BNI) Tbk. using the Monthly Financial Reports of the two banks for the first four months based on positive cases detected for the first time in Indonesia. Meanwhile, the calculation of the fair interest rate uses the Open Market Operation Approach and each sample is classified and calculated based on that approach. So that it will produce Net Interest Margin data for the two banks.

Based on the results of the above hypothesis, changes in the reference interest rate made by Bank Indonesia strongly affect the Rate of Fixed or Sensitive Assets and Liabilities against the Net Interest Margin (NIM) ratio of the two samples, where the correlation between the three variables is strong. So that the decision of Bank Indonesia to reduce the benchmark interest rate gradually and be careful is considered appropriate, especially in the face of the Coronavirus Disease Pandemic situation. This is because if Bank Indonesia cuts the reference interest rate at a high rate and at the same time, it will disrupt Bank Performance based on the Net Interest Margin ratio so that it can disrupt bank performance and if a bank experiences a disruption it will threaten the

stability of the Indonesian state Financial System. Based on this, the researcher provides a recommendation to the Board of Governors of Bank Indonesia to maintain the decision-making in reducing the benchmark interest rate gradually and with the principle of prudence.

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