

ANALYSIS OF EXTERNAL AND INTERNAL INFLUENCES ON NON-PERFORMING LOANS OF BANK XYZ

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ABSTRACT

This research aimed to analyze the impact of internal and external factors on non-performing loans (NPL) in Bank XYZ. Analyze using Error Correction Model (ECM) with time-series data from 2010 – 2017. The variable used in this research consists of external factors, they were GDP and BI Rate, and internal factors are loan growth, ROA, and GCG. The result in this research on the long-term model GDP had a significant negative impact on NPL Total and all segments, but it was the opposite in the short-term model, it has a positive and significant impact on Total NPL, Micro NPL, and Retail NPL. The BI Rate variable has no effect the long and short-term models. In the long-term model, the internal factor loan growth significantly affects Total NPL, Retail NPL and Medium NPL. ROA has a negative and significant impact on the overall NPL of Bank XYZ. Moreover, GCG does not involve changes in NPL. In the short-term model, the loan growth variable has a negative and significant effect on Retail NPL and Medium NPL in the short-term model. On the other hand, Corporate NPL has a positive and significant impact. ROA variable has a negative and significant effect on Total NPL, Micro NPL, Medium NPL and Corporate NPL. GCG only has a negative and significant impact on Corporate NPL.

KEY WORDS

Non-performing loan, credit, error correction model (ECM).

A bank is an intermediary institution, one of which functions as a credit channel so that the role of banking is enormous and interrelated for the financial system and economy in a country. Aviliani *et al.* (2015) stated that banking system stability is an element of creating financial system stability, and its ultimate goal is the stability of a country's economy. Credit risk reflected in the Non-Performing Loan (NPL) ratio in a bank can directly impact lower profitability (Keeton and Morris 1987). Banks' role is essential for the economy so that in carrying out their business activities, the regulator is closely monitored.

An increase in the amount of credit distributed will increase economic development, experiencing GDP growth. On the other hand, as an intermediary institution based on the principle of trust from the public, the Bank is required to run its business by upholding prudence (prudential banking). Credit is a bank's primary business activity, which is a productive asset for a bank. Therefore, the main risk that a bank has is credit risk. It reflects the ratio of the level of non-performing loans (NPL).

According to Messai and Jouini (2013), macroeconomic factors can affect the level of NPLs measured by GDP growth and the BI Rate. Increased GDP growth will have an impact on reducing NPLs. The results of research by Dash and Kabra (2010) in India, Akbar (2012) at the Commercial Bank Tbk in Indonesia, Messai and Jouini (2013) in three countries, namely Italy, Greece, and Spain, show that the relationship between GDP and NPL is opposite or negative and have a significant effect. It means that if there is an increase in

economic growth, it will directly reduce the level of NPLs. The results of research by Ekanayake and Azeez (2015) and Aviliani et al. (2015) found that there is a positive correlation between interest rates and NPLs.

Internal factors are influenced by the level of credit growth (Das and Ghosh 2007). Dash and Kabra (2010) prove that the credit portfolio level has a relationship with NPL. Ekanayake and Azeez (2015) ROA is one of the internal bank factors that measure bank profitability has a negative and significant impact on NPL. According to Laeven (2008), taking a bank's risk level depends on the corporate governance structure.

Bank XYZ has a maintained NPL level. However, in terms of the NPL ratio per segment, divided into the micro, retail, medium, and corporate segments, it has various NPL levels. In the middle part, the XYZ bank NPL level is relatively high compared to other segments. Based on the formulation of the existing problems, the study's objectives were to analyze the influence of external factors such as GDP and BI Rate on NPL of Bank XYZ per segment. Second, to analyze the impact of internal factors such as credit growth, ROA, and GCG on NPL of Bank XYZ per segment.

LITERATURE REVIEW

Banks' role as intermediary institutions is vital for developing the country (Adeola and Ikepsu 2017). Banks play an essential role in the economy due to their function as financial intermediaries and means of payment for goods and services (Hudgins and Rose 2005). Credit is the largest asset and source of income in a bank. Based on the Indonesian Banking Statistics on commercial banks, the amount of credit disbursed reached 97.15 percent compared to total assets in 2017.

One of the commonly used measures of bank credit risk is Non-performing Loans (NPLs). NPL is an important parameter to measure bank health (Berger and DeYoung 1997). According to Salas and Suarina (2002), Bank's non-performing loans are influenced by macro-economic and micro-economic factors. One of which macroeconomics factors is GDP growth, which has a significant and negative effect. In contrast, for the microeconomics factor, a bank's policy in credit management, one of which comes from credit growth, positively affects NPL. Messai and Jouini (2013). There is a significant and negative relationship between GDP and NPL in banks in Italy, Greece, and Spain from 2004 to 2008. According to Skarica (2014), the leading cause of the high level of NPLs is the economic slowdown, as seen from the coefficient GDP, unemployment rate, and inflation rate. Akbar (2012) states that the GDP level and bank size negatively affect NPL, and the Loan to Asset Ratio has a positive and significant effect on NPL.

The indicator of the component in measuring profitability is ROA, the Bank's performance in terms of profitability can see from the Bank's ability to manage its profitability. The bank profitability factor is one of the characteristics of the Bank Soundness Level. Credit is a productive asset for banks, so that banks are always required to supervise credit quality. According to Ekanayake and Azeez (2015), ROA is one of the internal bank factors that measure bank profitability negatively and significantly affect NPLs. Apart from the risk profile and profitability assessment factors, the Good Corporate Governance (GCG) factor included in the Bank's soundness level. GCG is a principle that must implement in every Bank. With good governance, the Bank expects to manage the company not only for the sole purpose of obtaining large profits but also taking into account the aspects of compliance and applied ethics. Research conducted by Ahmad *et al.* (2016) showed that board independence had a negative effect on non-performing loans.

METHODS OF RESEARCH

The data used in this study are secondary data from 2010 - 2017 quarterly, obtained from various sources (Bank Indonesia, BPS, Financial Services Authority, and Bank XYZ data). The population used in this study is Indonesian macroeconomic data and financial data at XYZ Bank. The sample selection method was carried out by purposive sampling. The

sample was chosen not randomly by using specific considerations adjusted to the objectives and research problems.

The cointegration regression model is used in this study to investigate the factors that affect long-term non-performing loans for Bank XYZ. The independent research variable (X) includes external and internal factors, namely Growth Domestic Product (GDP), BI Rate, Loan Growth per segment, Return on Asset (ROA), and Good Corporate Governance (GCG). The research dependent variable has total NPL, micro NPL, retail NPL, medium NPL, and corporate NPL. The method used in this research is descriptive analysis and uses the error correction model (ECM) analysis using time series data. Data processing in this study uses the Eviews 9 program. Based on the theory and previous studies, the hypothesis formulated is as follows:

- H1: GDP has a significant and negative effect on the NPL of Bank XYZ;
- H2: BI Rate has a significant and positive effect on the NPL of Bank XYZ;
- H3: Credit growth has a significant and positive effect on the NPL of Bank XYZ;
- H4: ROA has a significant and negative effect on the NPL of Bank XYZ;
- H5: GCG has a significant and negative effect on the NPL of Bank XYZ.

The cointegration regression model used in this study is to investigate the factors that affect long-term non-performing loans for Bank XYZ in the five models, namely:

$$\begin{aligned} \text{NPLTOT}_t (\text{model 1}) &= \beta_0 + \beta_1 \text{LnGDP}_t + \beta_2 \text{BIRATE}_t + \beta_3 \text{LGTOT}_t + \beta_4 \text{ROA}_t + \beta_5 \text{GCG}_t + \varepsilon_t \\ \text{NPLMIK}_t (\text{model 2}) &= \beta_0 + \beta_1 \text{LnGDP}_t + \beta_2 \text{BIRATE}_t + \beta_3 \text{LGMIK}_t + \beta_4 \text{ROA}_t + \beta_5 \text{GCG}_t + \varepsilon_t \\ \text{NPLRIT}_t (\text{model 3}) &= \beta_0 + \beta_1 \text{LnGDP}_t + \beta_2 \text{BIRATE}_t + \beta_3 \text{LGRIT}_t + \beta_4 \text{ROA}_t + \beta_5 \text{GCG}_t + \varepsilon_t \\ \text{NPLMEN}_t (\text{model 4}) &= \beta_0 + \beta_1 \text{LnGDP}_t + \beta_2 \text{BIRATE}_t + \beta_3 \text{LGMEN}_t + \beta_4 \text{ROA}_t + \beta_5 \text{GCG}_t + \varepsilon_t \\ \text{NPLKOR}_t (\text{model 5}) &= \beta_0 + \beta_1 \text{LnGDP}_t + \beta_2 \text{BIRATE}_t + \beta_3 \text{LGKOR}_t + \beta_4 \text{ROA}_t + \beta_5 \text{GCG}_t + \varepsilon_t \end{aligned}$$

The ECM model used in this study investigates the factors that affect the amount of Non-Performing Loans in the short term as follows:

$$\begin{aligned} \text{DNPLTOT}_t (\text{model 1}) &= \beta_0 + \beta_1 \text{DLnGDP}_t + \beta_2 \text{DBIRATE}_t + \beta_3 \text{DLGTOT}_t + \beta_4 \text{DROA}_t + \beta_5 \text{DGCG}_t + \beta_6 \text{ECT}_{t-1} + \varepsilon_t \\ \text{DNPLMIK}_t (\text{model 2}) &= \beta_0 + \beta_1 \text{DLnGDP}_t + \beta_2 \text{DBIRATE}_t + \beta_3 \text{DLGMIK}_t + \beta_4 \text{DROA}_t + \beta_5 \text{DGCG}_t + \beta_6 \text{ECT}_{t-1} + \varepsilon_t \\ \text{DNPLRIT}_t (\text{model 3}) &= \beta_0 + \beta_1 \text{DLnGDP}_t + \beta_2 \text{DBIRATE}_t + \beta_3 \text{DLGRIT}_t + \beta_4 \text{DROA}_t + \beta_5 \text{DGCG}_t + \beta_6 \text{ECT}_{t-1} + \varepsilon_t \\ \text{DNPLMEN}_t (\text{model 4}) &= \beta_0 + \beta_1 \text{DLnGDP}_t + \beta_2 \text{DBIRATE}_t + \beta_3 \text{DLGMEN}_t + \beta_4 \text{DROA}_t + \beta_5 \text{DGCG}_t + \beta_6 \text{ECT}_{t-1} + \varepsilon_t \\ \text{DNPLKOR}_t (\text{model 5}) &= \beta_0 + \beta_1 \text{DLnGDP}_t + \beta_2 \text{DBIRATE}_t + \beta_3 \text{DLGKOR}_t + \beta_4 \text{DROA}_t + \beta_5 \text{DGCG}_t + \beta_6 \text{ECT}_{t-1} + \varepsilon_t \end{aligned}$$

RESULTS AND DISCUSSION

The research object is XYZ bank, a commercial bank, and one of Indonesia's largest banks. Therefore, Bank XYZ has contributed a lot to the national banking industry, where a bank's role in the national economy is critical. Figure 1 describes the composition of credit to assets at XYZ Bank. Lending is the mainline of business at XYZ Bank. It is reflected in Figure 1, which shows that Bank XYZ's assets are mostly dominated by credit, which is a productive asset. From 2010 to 2017, there was an increasing trend in the composition of loans to Bank XYZ assets, 60 percent. Loans extended by Bank XYZ can provide an immense contribution to Bank XYZ's profit.

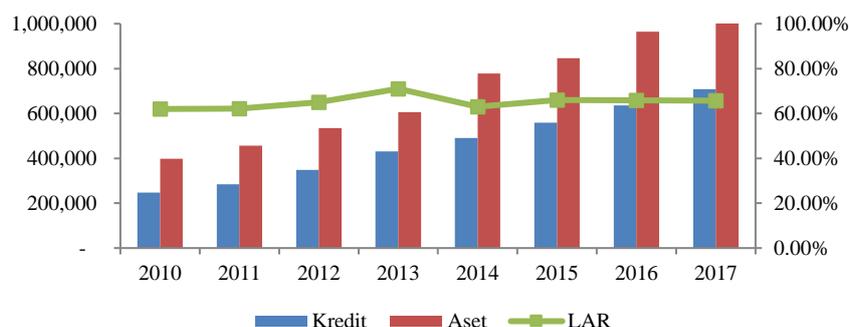


Figure 1 – Composition of loans to assets at XYZ Bank

During the study period, namely, from 2010 to 2017, the growth of XYZ Bank's financial performance had a positive trend and, on average, reached the predetermined targets. However, in particular, for XYZ Bank's Total NPL ratio during the study period, the average was above 100 percent and Micro and Retail NPLs. For Medium and Corporate NPLs, the average achievement is still below 100 percent. From the data analysis results, NPL targets' achievement often occurs in the fourth quarter or the end of the financial reporting period. One of which can be because the handling of non-performing loans is more focused on the last quarter so that it expects that there will be improvements in non-performing loans and will have an impact on financial performance. Moreover, this reflected in the average ROA achievement of Bank XYZ above 100 percent.

Results of the Descriptive Analysis of Model Variables. During the research period, from 2010 to 2017, there were 32 observations. The average NPL of Bank XYZ is 2.43 percent with a standard deviation of 0.74 percent, so the Total NPL at XYZ Bank is still below 5 percent according to the NPL limit of the regulator listed in POJK Number 15 / POJK.03 / 2017 concerning the determination of status and follow-up supervision of commercial banks. It is shown that during the research period, Bank XYZ include in the category of a healthy bank. However, when analyzed by dividing the NPL into 4 (four) segments, the smallest average NPL value is obtained in the micro-segment, namely 1.36 percent with a standard deviation of 0.19 percent, and the largest in the middle segment, namely 7.35 percent with a standard deviation of 2.56 percent.

Regarding external factors, names derived from macroeconomic variables from 2010 to 2017, which among others reflected in GDP with an average value of 2,091 trillion rupiahs, with the highest position in 2017 in the third quarter of IDR 2,552 trillion and the lowest in 2010 in the first quarter amounted to 1,642 trillion rupiahs. The average value of the BI Rate was 6.58 percent with the highest position in 2014 in the fourth quarter at 7.75 percent and the lowest position in 2017 in the third and fourth quarters, namely 5.50 percent.

Related to internal factors, which measure the performance of Bank XYZ during the study period from 2010 to 2017, is reflected in the total credit growth with an average value of 17.51 percent. The standard deviation of 5.58 percent, the highest position was achieved in 2013 in the second quarter of 29.96 percent, with the lowest place in 2015 in the first quarter of 9.36 percent. In terms of total credit growth, Bank XYZ shows that it is quite aggressive in distributing credit during the research period in one year, on average, grew by 17.51 percent. If an analysis of credit growth carried out in 4 (four) segments, the highest average value of credit growth is in the corporate part, namely with an average of 22.03 percent and the highest amount of 60.63 percent in 2014 in the fourth quarter. However, the lowest part experienced negative growth of -4.53 percent in 2010 in the fourth quarter of the same year was the most down GDP position.

The ROA ratio included in internal factors has an average value of 3.42 percent, with the highest value reaching 4.04 percent in 2012 in the second quarter and the lowest position of 2.73 in 2017 in the fourth quarter. Besides, for the GCG level at Bank XYZ, the average value was 79.11 percent, with a 95.24 percent value in 2010 in the second quarter, and the lowest position was 58.75 percent in 2012 in the fourth quarter. It shows that the level of GCG Bank XYZ through the active role of supervision of the Board of Commissioners is adequate.

Results of the Analysis of External and Internal Factors Influences NPL of XYZ. Before performing the Error Correction Model (ECM) analysis, a stationarity test carried out to ensure that the data used in the time series data analysis is stationary. Stationary testing is carried out at the level and if the data is not stationary. It is followed by stationary testing on the first derivative (first difference). The stationary test using the Eviews 9 software and all variables has been stationary on the first derivative (first difference). Table 1 describes the results of the research stationary test. The test results show that only four variables are stationary at the level, and the other variables are not stationary at the station. The stationary variables include the Intermediate NPL variable, retail credit growth, medium credit growth, and GCG. It has an ADF t-statistics value smaller than the critical importance and has a p-value of less than 5 percent.

Table 1 – Results of the Stationary Test with the ADF-test method at the level

Variables	ADF <i>t</i> -statistics Value	Mac Kinnon Critical Value			Details
		1%	5%	10%	
NPLTOT	-1,623	-3,700	-2,976	-2,627	Not Stationary
NPLMIK	-2,156	-3,700	-2,976	-2,627	Not Stationary
NPLRIT	-2,379	-3,700	-2,976	-2,627	Not Stationary
NPLMEN	-2,958	-3,662	-2,960	-2,619	Stationary ***
NPLKOR	-2,543	-3,662	-2,960	-2,619	Not Stationary
LNGDP	-0,409	-3,699	-2,976	-2,627	Not Stationary
BIRATE	-1,523	-3,670	-2,963	-2,621	Not Stationary
LGTOT	-2,429	-3,679	-2,968	-2,623	Not Stationary
LGMIK	-2,417	-3,670	-2,964	-2,621	Not Stationary
LGRIT	-3,249	-3,670	-2,964	-2,621	Stationary**
LGMEN	-2,995	-3,679	-2,968	-2,623	Stationary**
LGKOR	-1,869	-3,661	-2,960	-2,619	Not Stationary
ROA	-1,225	-3,662	-2,960	-2,619	Not Stationary
GCG	-3,278	-3,661	-2,960	-2,619	Stationary**

The degree of integration test is carried out if there is still data not stationary in the unit root test. Variable data that is not stationary at the level will be tested in the first difference to obtain static data. Here are the integration degree test results on the first difference through ADF-test explained in Table 2. The results show that all variables used in this study are stationary in the first derivative. The data has met the stationary test and is ready to be used in the Error Correction Model (ECM) analysis.

Table 2 – Results of the Stationary Test with the ADF-test method on the first difference

Variables	ADF <i>t</i> -statistics Value	MacKinnon Critical Value			Details
		1%	5%	10%	
D(NPLTOT)	-2,400	-2,653	-1,954	-1,610	Stationary**
D(NPLMIK)	-2,115	-2,653	-1,954	-1,610	Stationary**
D(NPLRIT)	-1,609	-2,653	-1,954	-1,609	Stationary***
D(NPLMEN)	-5,278	-3,670	-2,964	-2,621	Stationary*
D(NPLKOR)	-6,552	-3,670	-2,964	-2,621	Stationary*
D(LNGDP)	-1,659	-2,653	-1,954	-1,609	Stationary***
D(BIRATE)	-3,896	-3,670	-2,963	-2,621	Stationary*
D(LGTOT)	-3,837	-3,700	-2,976	-2,627	Stationary*
D(LGMIK)	-6,413	-3,700	-2,976	-2,627	Stationary*
D(LGRIT)	-2,925	-3,670	-2,963	-2,621	Stationary***
D(LGMEN)	-4,218	-3,670	-2,963	-2,621	Stationary*
D(LGKOR)	-4,861	-3,670	-2,964	-2,621	Stationary*
D(ROA)	-4,521	-3,670	-2,964	-2,621	Stationary*
D(GCG)	-6,488	-3,670	-2,963	-2,621	Stationary*

Note: *) significant at the 1%,5%,10% level; **) significant at the 5%,10% level; ***) significant at the 10% level.

Analysis of External and Internal Factors Influences NPL of XYZ Bank in the Long-Term. External factors from XYZ Bank that affect Total NPL, Micro NPL, Retail NPL, Medium NPL, and Corporate NPL are the GDP variable. The GDP variable has a negative and significant effect on Total NPL, Micro NPL, Retail NPL, Medium NPL, and Corporate NPL in the long run. The GDP variable shows significant results with a negative direction on total NPL following the initial hypothesis results, which shows that the GDP variable has a significant effect on the NPL variable. These results are in line with research (Ekanayake and Azeez 2015; Akbar 2012; Das and Kabra 2010; Messai and Jouini 2013; Fofack 2005), which show the same results. GDP as a measure of economic growth has an impact on improving the welfare of the people of a country, so the economic growth can increase the payment ability of debtors, which can lead to a decrease in the level of NPL at XYZ Bank and vice versa. The BI Rate variable does not affect Bank XYZ's NPL. The result of this study are in line with research Shingjeji (2013) shows that macroeconomic factors with interest rate variable does not affect the NPL. Changes in the benchmark interest rate, both increased and decreased from the previous period, have no direct effect on interest rates in the banking

industry including Bank XYZ. Factor that affected changes in interest rate in a bank beside the benchmark interest rate can be seen from the fundamental conditions of each bank, which is reflected in the ability of asset and liabilities management that have an impact on profitability.

While in the long term, Total NPL, Retail NPL, and Micro NPL are influenced by loan growth, which has a negative and significant effect in the long term. This result is different from the initial hypothesis. It can be due to the internal ability of XYZ Bank in lending, which is carried out by observing the principle of prudence (prudential banking). According research to Erdinc and Abazi (2014), loan growth does not have a positive effect on NPL because banks with the potential to strong monitor loan quality hence, rein on problem loan. Through an adequate risk management system, banks reduce excessive risk taking and assist in monitoring the NPL level.

NPL Total and NPL all segments of XYZ Bank are influenced by ROA, which has a negative and significant effect in the long term. These results are in line with research (Ekanayake and Azeez 2015; Messai and Jouini 2013; Fofack 2005), which show the same products that ROA has a negative and significant effect. On the other hand, internal factor in the long-term GCG variable do not affect NPL Total and NPL all segments of Bank XYZ. GCG is the result of a culture that is internalized in the company, not only in the credit sector, but also in a broader and bank-wide scope. In Nyor and Mejabi (2013) research, it is stated that the GCG variable cannot be relied on to be a solution to problems in Nigerian Banks.

Analysis of External and Internal Factors Influences NPL of XYZ Bank in the Short-Term. The external factor of XYZ Bank that affects change in Total NPL, Micro NPL, and Retail NPL in the short term is the change in GDP. The difference in GDP variable has a positive and significant effect on changes in Total NPL, Micro NPL, and Retail NPL in the short term. This study's results are in line with research conducted by Inekewe (2013), which states that there is a positive relationship between GDP and NPL in Nigeria. The researcher says that these results describe Nigeria's real economic conditions; this can be due to unused bank credit. In productive activities, national economic improvement does not reduce non-performing loans in banks within a specific time. Besides, when comparing the GDP and Total NPL of Bank XYZ, it can be seen that GDP always increases every quarter, even though NPL in a certain period has an increasing trend. The change BI Rate variable does not affect change Bank XYZ's NPL the result same in the long-term.

Internal factors consisting of loan growth, ROA, and GCG have an influence on Bank XYZ's NPL in several credit segments. Loan growth had a negative and significant impact on Bank XYZ's NPL in the retail and medium-sized segments, while on the Corporate segment it had a positive and significant impact. The results of reasearch by Dash and Gosh (2007) credit growtj is inversely proportional to NPL, a bank that disburses credit with experienced human resources and adequate infrastructure support can control non-performing loans. Loan growth in the corporate segment has a positive effect on Corporate NPL. This result is in accordance with the initial hypothesis and also in accordance with the credit risk theory that credit distribution has a risk of default from the debtor. This result is also in line with the research of Zheng et al (2019) shows that credit growth has a positive effect on NPL in the short-term model. The characteristics of corporate debtors are more vulnerable to external conditions, not only economic factors, but also negative issues and sentiments that can have an impact on corporate debtors. In addition, regulations also have a direct impact on corporate debtors. Corporate credit segment has a large portfolio amount but a small number of debtors can pose a credit concentration risk. Internal factors of XYZ Bank that affect changes in total NPL, Micro NPL, Medium NPL, and Corporate NPL in the short term are changes in ROA. ROA is one of the internal bank factors that measures bank profitability and has a negative and significant influence on NPL which is the same as in the short-term model. Banks that have good fundamentals and performance in terms of credit processing and monitoring will have adequate infrastructure, resources, and systems to support good quality and sustainable credit growth.

Changes in GCG have a negative and significant effect on changes in corporate NPL in the short term. These results align with research of Nworji et al. (2011), which shows that

corporate governance influences every risk-taking. The XYZ Bank Corporate credit segment is directly handled by executive officers, directors, and directly supervised by the Board of Commissioners.

MANAGERIAL IMPLICATIONS

For XYZ Bank, in the credit strategic plan policy, it is necessary to pay attention to the internal capabilities of the Bank, such as infrastructure, technology, resources, policies, and procedures, which can support credit growth. So, the Bank's business can be healthy, profitable, and sustainable. Banks need to carry out an in-depth and specific analysis per credit segment to formulate a credit portfolio management strategy to have a good quality and profitable credit portfolio. Especially for the improvement of the medium and corporate credit segments. In the Micro segment, it is necessary to strengthen risk mitigation for each loan disbursement and margin, this is due to XYZ Bank has a large micro segment loan portfolio with characteristics small amount credit outstanding but has many debtors. In the retail segment, strengthening supervision and monitoring supervision and monitoring at branch and sub branch level office while at regional level office for medium segment. The implementation of policies and supervision of the corporate credit risk limit as managing the corporate segment to avoid the risk of credit concentration.

The Financial Services Authority and Bank Indonesia can work together to issue a more comprehensive study related to NPL periodically (per segment / per economic sector / every product), both from internal factors, the point of view of bank supervisors (Otoritas Jasa Keuangan) and external factors related to macroeconomic conditions and the implementation of fiscal or monetary policies (Bank Indonesia), so that they can become a reference for banks in anticipating credit risk, especially in the risk of credit concentration.

CONCLUSION

External factors of GDP have a negative and significant effect on Total NPL and all segments in the long-term model. In contrast, the short-term model has a positive and significant impact on Total NPL, Micro NPL, and Retail NPL. External factors of the BI Rate do not have a considerable impact on Total NPL and all segments, both long and short-term models.

Internal factors for credit growth have a negative and significant effect on Total NPL, Retail NPL and Medium NPL. Meanwhile, the short-term model has a negative and significant impact only on Retail NPL and Medium NPL, only has a significant positive effect on Corporate NPL. Internal factor ROA has a negative and significant effect on Total NPL and all segments in the long-term model. In contrast, the short-term model has a negative and significant effect expect Retail NPL. The internal factors of GCG have a negative and significant impact on Total NPL and all segments in the long-term model. The short-term model has a negative and significant effect on Corporate NPL.

The next researcher should increase the research period so that more samples can be obtained. The data is more varied so that it can describe changes in external and internal conditions in the company. Other parameters of macroeconomic conditions can add as external variables. They can use internal variables directly related to credit 5C analysis to be more comprehensive in obtaining a more comprehensive picture of the factors that affect NPL in the banking industry.

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