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The Influence of Non-Performing Loan and Loan to Deposit Ratio on the Level of Conventional Bank Health in Indonesia

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Abstract

This study aims to examine the factors that influence the health of conventional banks in Indonesia. Specifically, this study examined the effect both partially and simultaneously of ratio of non-performing loans (NPL), the ratio of loans to deposits (LDR), good corporate governance (GCG), capital adequacy ratio (CAR), net interest margin (NIM), and operating costs to operating income (OEOI) to the health of conventional banks listed on the Indonesia Stock Exchange. Then, testing is carried out to analyze the factors that have the most dominant influence on the dependent variable of the health bank. This study uses secondary data which includes 20 conventional banks listed on the Indonesia Stock Exchange during the period 2008-2012 using purposive sampling. Data were analyzed using logistic regression to test the effect of independent variables on the dependent variable. The feasibility test of the model and the test of the coefficient of determination are carried out to test the hypothesis with a confidence level of 5%. The results of the study indicate that two independent variables of operating costs to operating income, and good corporate governance have a significant negative effect on the health of the bank. On the other hand, bad credit, the ratio of loans to deposite, net interest margin, and capital adequacy ratio do not significantly influence the health of the bank. Finally, the evidence shows that the predictive power of the logistic regression model is 50.1%. Some implications are discussed at the end of the paper.

Keywords

Non-performing loans, loans to deposit ratio, good corporate governance, capital adequacy ratio, bank health

1. Introduction

The performance of the bank can be assessed from several indicators. One of the main sources of indicators that is used as the basis for assessment is the financial statements of the bank concerned (Claessens & Laeven, 2003; Borio & Drehmann, 2009). Based on the report, a number of financial ratios will be calculated which are commonly used as the basis for evaluating the health of the bank. Financial ratio analysis allows management to identify key changes in the number trend, and the relationship and reasons for the change (Hoshi et al., 1990). The results of financial statement analysis will help interpret various key relationships and trends that can provide a basis for consideration of the potential success of the company in the future. Indonesian government as regulator and supervisor of economic policies has issued Bank Indonesia Regulation number 6/10/PBI/2004 which contains bank health assessments using CAMELS assessment structures or components. Then updated with Bank Indonesia Regulation Number 13/1/PBI/2011 dated January 5, 2011 which contains procedures for evaluating bank health with a risk-based bank rating by looking at the assessment factors which consist of risk profile, good corporate governance, profitability and capital. The combined value resulting from the merger of the four categories, known as the RGEC rating, shows the perceptions of regulators that the bank might face problems in the future, also in the face of business complexity and an increasingly high risk. Based on the combined value, banks are classified as very healthy, healthy, fairly healthy, and unhealthy.

The full calculation guide is regulated in Bank Indonesia Circular (SE) No.13/24pl/DPNP dated October 25, 2011 concerning the evaluation of the health level of the commercial bank as an implementation guideline from Bank Indonesia Regulation No.13/1/PBI/2011, which requires banks general to conduct a self-assessment of Bank Health Level by using a Risk approach (risk-based bank rating/RBBR) both individually and on a consolidated basis. The indicators used in assessing the health of banks that refer to risk-based bank ratings (RBBR), namely, risk profiles will calculate the company's risk factors by using a ratio of nonperforming loans (NPL) as a proxy for credit and loan risk to deposit ratio (LDR) as a proxy for liquidity risk, good corporate governance (GCG) obtained from the results of GCG implementation in companies, earnings (earnings) using the ratio of net interest margin (NIM), capital (capital) using the capital adequacy ratio (CAR), as well as efficiency factors using the ratio of operating expenses to operating income. This study examined the effect of the ratio of non-performing loans (NPL), loan to deposit ratio (LDR), good corporate governance (GCG), net interest margin (NIM), capital adequacy ratio (CAR), and operating expenses operating income (OEOI) towards the health performance of banking industry listed on the Indonesia Stock Exchange (IDX) in the period between 2008 and 2012. The results of this study are expected to contribute to the results of the literature as empirical evidence in the field of banking that can be used as a reference for future research that still has to do with this research. In practical terms, this research is expected to provide empirical contributions in policy making, especially concerning finance and other policies, especially based on the analysis of RBBR components.

2. Literature Review and Hypothesis Development

2.1. Bank health

Budisantoso and Triandaru (2005) define the health of banks as the ability of a bank to carry out banking operations normally and be able to fulfill all of its obligations properly in ways

that comply with applicable regulations. The definition of the health of the bank is a very broad limitation, because the health of the bank includes the health of a bank to carry out all its banking business activities. These activities include the ability to raise funds from the community, from other institutions and. The health of the bank is the result of qualitative and quantitative research on various aspects that influence the condition or performance of a bank through the assessment of risk profile factors, corporate governance, earnings, and capital. Quantitative assessment is an assessment of the position, development, and projections of the bank's financial ratios. Qualitative assessment is an assessment of the factors that support the results of quantitative assessments, the application of risk management, and bank compliance and currently Bank Indonesia has implemented a health assessment method by looking at both qualitative and quantitative aspects.

According to Bank Indonesia Regulation No. 13/1/PBI/2011 concerning Rating of Commercial Bank Health, which was effectively implemented on January 1, 2012, namely to assess the bank's health at the end of December 2011. Bank health is the result of an assessment of the bank's condition on bank risk and performance. The composite ranking is the final rating of the bank's health rating. The smaller composite ranking sequence reflects healthier bank conditions. The health of a bank is in the interest of all parties involved, both the owner, management of the bank, and the community who use the bank's services. The condition of the bank can be used by these parties to evaluate the bank's performance in applying the precautionary principle, compliance with applicable regulations and risk management. In detail, Bank Indonesia Regulation No. 13/1/PBI/2011 concerning a system for evaluating the health of commercial banks, evaluating the health of banks includes evaluating several aspects, including the assessment of risk, good corporate governance, earnings and capital.

The first aspect is the assessment of risk profile factors as referred to an assessment of inherent risk and the quality of the application of risk management in bank operations carried out on 8 (eight) risks. The first is credit risk. Credit risk is defined as the risk of the inability of a debtor or counterparty to repay a bank (default counterparty). This type of risk is the biggest risk in the Indonesian banking system and can be a major cause for bank failure. Credit risk can be sourced from bank activities, including the distribution of bank funds both on-and off-balance-sheet. The identification of bank credit risk sources is carried out in the know your bank (KYB) stage, namely analysis of the bank's main business activities and balance sheet structure and bank income statement. Second, market risk. Market risk is a loss on balance sheet and administrative account positions including derivative transactions due to overall changes in market conditions. This risk can be sourced from trading book and banking book bank. Market risk from trading books (traded market risk) is the risk of a loss in investment value due to trading activities (making purchases and sales of financial instruments continuously) in the market with the aim of making a profit. This arises as a result of the actions of banks that deliberately make a risky position in the hope of gaining profit from the position of risk they have taken. Unlike the traded market risk, the risk in the banking book is a natural consequence due to the nature of the bank's business carried out with its customers. Generally, banks have a short-term fund structure because loans are generally longer term than deposits from customers. Third, liquidity risk. Liquidity risk is a risk due to the inability of banks to fulfill maturing obligations from cash flow funding sources and/or from high-quality liquid assets that can be pledged, without disturbing the activities and financial condition of the bank. Liquidity is very important to maintain the

business continuity of the bank. Therefore, banks must have good bank liquidity risk management.

Fourth, operational risk. Operational risk is a risk due to insufficiency and/or non-functioning of internal processes, human errors, system failures, and external events that affect the bank's operations. In accordance with the definition of operational risk above, the categories of causes of operational risk are divided into four types, namely people, internal processes, systems and external events. Fifth, legal risk. Legal risk is the risk arising from legal claims and weaknesses in the juridical aspect. This risk arises, among others, due to the absence of supporting legislation or weaknesses in the engagement, such as not fulfilling the requirements for legal contracts or collateral that are inadequate. In accordance with Basel II, the definition of operational risk includes legal risk (but does not include strategic risk and reputation risk). Legal risk can occur in all aspects of transactions in the bank, including contracts with customers and other parties and can affect other risks, including compliance risk, market risk, reputation risk and liquidity risk. Sixth, strategic risk. Strategic risk is the risk due to the inaccuracy of banks in making decisions and/or implementing strategic decisions and failure to anticipate changes in the business environment. Strategic risk is classified as a business risk that is different from the type of financial risk such as market risk, or credit risk. The failure of the bank to manage strategic risk can have a significant impact on changes in other risk profiles. For example, banks that implement a TPF growth strategy by providing high interest rates have a significant impact on changes in liquidity risk profile and interest rate risk. Seventh, compliance risk. Compliance risk is a risk arising from a bank not complying with and/or not implementing the applicable laws and regulations. In practice compliance risk is attached to the bank's risks related to legislation and other applicable provisions, such as credit risk, minimum capital requirement, earning asset quality, and other related risks. Eighth is reputation risk which refers to the risk of decreasing the level of trust.

Second aspect is Good Corporate Governance (GCG). The assessment of the GCG factor is an assessment of bank management for the implementation of GCG principles. Banks are required to implement GCG principles in each of their business activities at all levels or levels of the organization including when preparing their vision, mission, strategic plan, implementation of policies and internal supervision measures. The scope of the application of the principles of GCG according to SE No. 15/15/DPNP must at least be realized in the implementation of the duties and responsibilities of the Board of Commissioners; implementation of the duties and responsibilities of the Board of Directors; completeness and implementation of the duties of the Committee; handling conflicts of interest; application of the compliance function; implementation of the internal audit function; the application of the external audit function; the application of risk management including the internal control system; provision of funds to related parties and large exposures; transparency of the Bank's financial and non-financial conditions, GCG implementation reports and internal reporting; and Bank's strategic plan. Given the purpose of GCG implementation is to provide maximum corporate value to stakeholders, the principles of GCG must also be realized in the relationship between the bank and stakeholders.

Third aspect is earnings. The assessment of profitability factors includes an assessment of components of achievement of return on assets (ROA), return on equity (ROE), net interest margin (NIM), and bank efficiency level; development of operating profit, diversification of income, application of accounting principles in recognition of revenues and costs, and prospects for operating profit (Kasmir, 2007).

Fourth aspect is capital. The assessment of capital factors includes an assessment of components of adequacy, composition and projection of capital and the ability of banks to cover problem assets; the ability of banks to maintain the need for additional capital from profits, bank capital plans to support business growth, access to capital sources, and financial performance of shareholders to increase bank capital.

Based on the determination of PBI No. 13/1/PBI/2011 ranks each factor determined by the Composite Rating. The Composite Rating 1 (PK-1) reflects the condition of banks that are generally very healthy, so that they are considered to be able to deal with significant negative effects of changes in business conditions and other external factors. Composite Rating 2 (PK2) reflects the condition of banks that are generally healthy, so that they are considered capable of facing significant negative effects from changes in business conditions and other external factors. Composite Rating 3 (PK-3) reflects the condition of banks that are generally quite healthy, so that they are considered capable of dealing with significant negative effects of changes in business conditions and other external factors. Composite Rating 4 (PK-4) reflects the condition of banks that are generally less healthy, so that they are considered to be unable to deal with significant negative effects of changes in business conditions and other external factors. Composite Rating 5 (PK-5) reflects the condition of banks that are generally unhealthy, so that they are considered unable to deal with significant negative effects of changes in business conditions and other external factors. Moreover, the bank is considered to be health if it has Composite Rating 1 (PK-1) or Composite Rating 2 (PK-2).

2.2. NPL on bank Health

Non-performing Loans (NPL) shows that the ability of bank management in managing nonperforming loans provided by banks. The higher the ratio, the worse the quality of bank credit that causes the number of problem loans to increase, then the likelihood of a bank in problematic conditions increases (Almilia and Herdaningtyas, 2005). Based on Bank Indonesia Regulation No. 6/9/PBI/2004 referred to as Non-Performing Loans (NPL) are loans with substandard, doubtful and loss quality based on Bank Indonesia regulations. Nonperforming Loans (NPL) reflect credit risk. The smaller the Non-performing Loan (NPL), the smaller the credit risk borne by the bank, so that the bank is further away from bankruptcy. In order for the bank's value to this ratio to be good, Bank Indonesia sets the criteria for net NPL ratios below 5% (Ayuningrum, 2011). In other words, the NPL is the level of bad credit at the bank. If the level of NPL is high, then the bank will suffer losses due to the rate of return on bad credit, which can result in bankruptcy, on the contrary the lower the NPL, the bank will experience more profits, which means the bank is in a healthy condition. Therefore, a hypothesis can be formulated regarding the effect of NPL on the bank's health level as follows:

H1. NPL has a negative effect on bank health.

2.3. LDR against the health of the bank

Loan to Deposit Ratio (LDR) is used to assess the liquidity of a bank, namely by showing the ability of a bank to provide funds to its debtors with capital owned by banks and funds collected from the public. According to Taswan (2010), LDR ratio is also used to assess the liquidity of a bank by dividing the amount of credit given by the bank to third party funds. The higher the ratio, the better the bank's health will be because the loans channeled by the

bank smoothly make the bank's income increase which will improve the health of the bank as well. Thus, it can be formulated that the LDR has a positive effect on the health of the bank.

H2. LDR has a positive effect on bank health.

2.4. Effect of GCG score on bank health

The score of GCG in the banking is set by Bank Indonesia to help investors to understand the implementation of GCG in banks (Mashitoh, 2013). Investors can see existing GCG scores to determine their investment (Love & Klapper, 2002; Cheung et al., 2007; Cormier et al., 2010). The score of governance at banks shows good quality management and there are no problems that can make moral hazard for customers and investors (Macey & O'hara, 2003). According to BI Decree No. 9/12/DPNP, the smaller the composite value in GCG, the quality of management in running the bank's operations is very good so that the bank can benefit. This means that the better GCG performance, the level of trust from customers and investors shows a positive response. So that it can be concluded that there is an inverse or negative relationship because the smaller the GCG score, the better the performance, the bank will be healthier.

H3. GCG has a negative effect on bank health.

2.5. NIM on bank health

The NIM ratio is used to measure the ability of bank management to manage their productive assets to generate net interest income. The greater the ratio, the higher the interest income of productive assets managed by the bank so that the possibility of a bank in a problematic condition is getting smaller. The results of research conducted by Sugiarti (2012) show that Net Interest Margin (NIM) has a significant effect and has a positive effect on bank health. Thus, it can be formulated that the NIM has a positive effect on the health of the bank.

H4. NIM has a positive effect on bank health

2.6. Effect of CAR variables on the health of the Bank

Capital Adequacy Ratio (CAR) is the ratio of the bank's own capital to the capital requirements available after calculating the margin risk (growth risk) of risky assets (RWA) (Siamat, 1993). The CAR is intended to determine the existing capital capacity to cover possible losses in credit activities and securities trading. According to Bank Indonesia Regulation Number 15/2/PBI/2013, the CAR value of a banking company is equal to or greater than 8% (eight percent). Therefore, the greater the CAR ratio, the better the bank's health.

H5. CAR has a positive effect on the health of the bank.

2.7. Efficiency ratio on bank health

The OEOI ratio is often called the efficiency ratio that is used to measure the ability of bank management to control operational costs against operating income. Considering the

main activities of the bank in principle are acting as intermediaries, namely collecting and channeling public funds, the bank's costs and operating income are dominated by interest costs and interest yields (Dendawijaya, 2001). The greater OEOI reflects the lack of the ability of banks to reduce their operational costs which can cause losses because banks are less efficient in managing their business (Bank Indonesia, 2004). On other hand, the smaller the ratio means the more efficient the operational costs incurred by the bank concerned so that the possibility of a bank in a problematic condition is getting smaller. Thus, it can be formulated that the OEOI variable has a negative effect on the health of the bank. The results of research conducted by Almilia and Herdiningtyas (2005) show that operational expenses on operational income (OEOI) have a significant effect on the problematic conditions of banks that directly affect the health of banks.

H6 = OEOI has a negative effect on bank health.

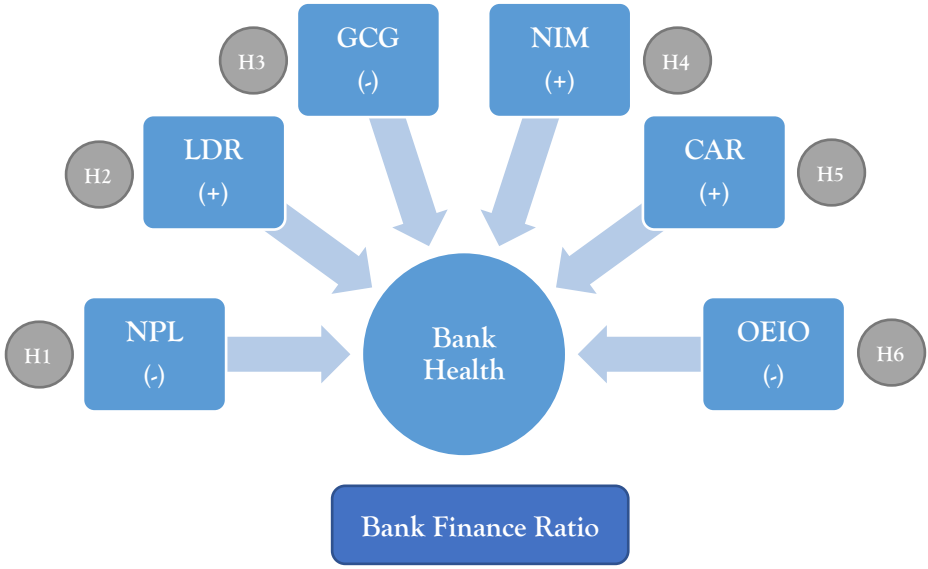

Figure 1: Theoretical Model

3. Research Methods

3.1. Research design

This study aims to empirically analyze the factors predicted to influence and significantly affect the health of the bank (Figure 1). It is necessary to test the hypotheses that have been carried out according to the research method in accordance with the variables studied in order to get more accurate results. The indicators used to assess the health of this bank are banking financial ratios consisting of NPL, LDR, GCG, NIM, CAR, and efficiency ratio.

3.2. Sampling

Sampling is done by purposive sampling method. The sample in this study is determined by with the following criteria: (1) Banks have been listed on the IDX since 2008 or before. (2)

Banks really still exist or at least still operate in the period 2008-2012 (not frozen or liquidated by the government). (3) Banks that are included in bank ratings for 2008-2012 published by Infobank magazine. (4) Complete data (financial statements and GCG) is available.

Based on the above criteria, Table 1 shows 20 go public banks as samples.

Tabel 1: Sampling

Information	Frequency
Population	31
Unlisted since 2008	(6)
Uncompleted data	(5)
Final Sample	20

Source: Indonesian Capital Market Directory, 2012

3.3. Data collection

This study took secondary data in the form of financial statements from 2008 to 2012 published by Indonesian print media (Infobank), internet media, annual banking reports, Indonesian Capital Market Directory (ICMD) and Indonesian stock exchange (IDX). Periodization of research data covering data from 2008 to 2012 is seen as sufficient to represent the condition of banks that went public in Indonesia at that time.

3.4. Variable Measurement

The dependent variable of bank health is defined as the soundness of banks categorized as healthy banks with a score of 1, and as unhealthy with the value of 0. Measurements are calculated based on an assessment conducted by the research bureau from Infobank magazine.

The independent variable of NPL is the ability of bank management in managing nonperforming loans provided by banks. The LDR that refers to the liquidity of a bank is measured by dividing the amount of credit given by the bank to third party funds. GCG refers to how well a company applies GCG based on the criteria set by the Indonesian Index Corporate Governance, which is calculated based on the self-assessment calculation. NIM is the ratio of net interest income to average total productive assets. CAR Shows how much the total risk-bearing bank assets (credit, participation, securities, bills on other banks) are also financed from their own capital in addition to obtaining funds from sources outside the bank. OEOI measures the ability of bank management to control operational costs against operating income.

3.5. Data analysis

Testing of the hypothesis in this study uses logit regression analysis. Logit regression analysis is used to measure the strength of the relationship and shows the direction of the relationship between the independent variables (NPL, LDR GCG, NIM, CAR, OEOI) on Banking Health on the IDX as the dependent variable.

Ln [S|NPL, LDR, GCG, NIM, CAR, OEOI] = b0 – b1NPL + b2LDR – b3GCG + b4NIM + b5CAR – b6OEOI

or,

$$\mathbf{Ln} = \frac{\boldsymbol{P}}{\mathbf{1}-\boldsymbol{p}} = \mathbf{b0} - \boldsymbol{b1NPL} + \mathbf{b2LDR} - \mathbf{b3GCG} + \mathbf{b4NIM} + \mathbf{b5CAR} - \mathbf{b6OEOI}$$

In which: Odds (S|NPL, LDR, GCG, NIM, CAR, OEOI) = $\frac{P}{1-p}$

Information : p: Bank Health; b0: Constants; b1: Credit Risk regression coefficient; b2: Liquidity Risk; b3: good corporate governance; b4: earnings; b5: capital; b6: efficiency; NPL: Non-performing Loan; LDR: Long Debt Ratio; GCG: Good Corporate Governance; NIM: Net Interest Margin; CAR: capital adequacy ratio; OEOI: Operational Cost/Operating Income.

4. Results

4.1. Descriptive statistics

This research is a study using cross section data from 20 public banks during 2008 - 2012. Furthermore, a number of these data are used for data analysis and hypothesis testing. By using a combination of data for 5 years it is obtained as many as 5 x 20 data = 100 research data. From descriptive statistics, it was found that out of 100 banks there were 86 banks or 86% were healthy banks, while the remaining 14 banks are unhealthy (Table 2).

Table 2: Frequency of Sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unhealthy	14	14.0	14.0	14.0
	Healthy	86	86.0	86.0	100.0
	Total	100	100.0	100.0	

Table 3: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NIM	100	3.74	16.64	6.6740	2.70485
NPL	100	.40	10.63	3.1574	2.28615
CAR	100	9.92	47.57	16.0299	5.41798
OEOI	100	45.50	114.63	82.6516	12.12171
LDR	100	50.27	108.42	81.2783	12.50700
GCG	100	1.00	2.68	1.6723	.50944
Valid N (listwise)	100				

The average NIM of sample banks during 2008 - 2012 was obtained at 6.6740%, indicating that the average sample bank was able to obtain profits obtained from interest of up to 6.6740%. The average NPL is 3.1574%, revealing that the average amount of uncollectible funding owned by banks is 3.1574% of all funding made by banks. The average CAR at commercial banks is 16.0299%. This means that the average risk-weighted asset owned by the bank is 16.0299% of the total capital owned by the bank. This result shows

that the sample bank has a minimum capital adequacy of 8% as determined by Bank Indonesia. The lowest CAR value is 9.92% and the highest CAR is 47.57%.

Furthermore, the average efficiency ratio is 82.6516%, meaning that the average operating expenses incurred by the bank reached 82.6516% of its operating income. The average LDR is 81.2783%, meaning that the funding issued by the sample bank reaches 81.2783% compared to the deposit or funds collected from the community. For GCG, the average GCG score is 1.6723, with the lowest score of 1.00 and the highest score of 2.68 (Table 3).

4.2. Model fit Testing

The first analysis conducted was to assess the feasibility of the logistic regression model to be used. The feasibility test of the logistic regression model is done by using the Goodness of Fit Test which is measured by the Chi-Square value at the bottom of the Hosmer and Lemeshow test. The results of model testing show that the Hosmer Lemeshow test has a probability number of 1,000> 0.05. This means that the logistic regression regression model is fit (Table 4).

Table 4: Hosmer and Lemeshow Test

Model	Hosmer and Lemeshow Test	Sig
Fit Testing	0.276	1.000

4.3. Overall fit model

This test is done by comparing the value between -2 Log Likelihood (-2LL) at the beginning (Block Number = 0) with the value of -2 Log Likelihood (-2LL) at the end (Block Number = 1). The reduction in the value between the initial -2LL (initial-2LL function) and the value of -2LL in the next step (-2LL end) indicates that the model is hypothesized to be fit with data (Ghozali, 2001).

Table 5: Block Number

Model	-2 Log Likelihood	
	Block Number = 0	Block Number = 1
-2 LL Testing	80,993	11,412

Table 4.10 shows that the value of -LLL has decreased. At -2LL beginning (Block Number = 0) the number -2LL is 80.993, while the -2LL end (Block Number = 1) the number -2LL is 11.412 (Table 5). The results of the likelihood reduction test get a significance value below 0.05 for the four models. This reflects that NIM, NPL, CAR, OEOI, LDR and GCG are good models in explaining bank health (Table 6).

Table 6: Omnibus Test

Model	Results	
	Chi square	Sig
Omnibus test	69,580	0,000

4.4. Coefficient of determination

Cox & Snell's R Square is the same size as R2 on multiple regression based on the likelihood estimation technique with a maximum value of less than 1 (one) so that it is difficult to interpret. Nagelkerke's R Square is a modification of the Cox and Snell coefficients to ensure that the values vary from 0 (zero) to 1 (one). This is done by dividing the Cox and Snell's R2 values by their maximum values. The value of Nagelkerke's R Square can be interpreted like the value of R2 at multiple regression (Ghozali, 2001). The output in table 7 shows the value of Cox Snell's R square was obtained at 0.501 which indicates that the variables NIM, NPL, CAR, OEOI, LDR and GCG can explain the probability of a bank's health of 50.1% (Table 7).

Table 7: Coefficient of Determination

Model	**R2**	
	Cox & Snel	Nagelkerke
R-square	0.501	0.903

4.5. Classification matrix

The classification matrix aims to show the predictive power of the regression model in predicting possible health levels in banks. The results of the classification matrix for the regression model can be seen in Table 8.

Table 8: Classification Matrix

			Predicted		
			Status		**Percentage**
		Observed	Unhealthy	Healthy	
Step 1	***Status***	Unhealthy	13	1	92.9
		Healthy	1	85	98.9
	Overall Percentage				98.0
a. The cut value is .500					

The predictive power of the regression model to predict the health level of the sample bank reached 98.0%, of which 14 companies from unhealthy observation, 13 companies or 92.9% were accurately predicted as unhealthy companies. Of the 86 companies that were observed as healthy companies, 85 companies or 98% were correctly predicted as healthy companies.

4.6. Testing of regression coefficients

The results of testing the effect of NIM on bank health obtained the negative beta coefficient (B) on the NIM of -0,550. The value of the significance of the test is obtained at 0.277. Significance values greater than 0.05 indicate that the NIM has no significant effect on the health of the bank. This means that hypothesis 1 is rejected. Furthermore, the results of testing the effect of NPL on bank health were obtained beta (B) in the NPL with a positive value of 0.609. The significance value of the test was obtained at 0.239. Significance values greater than 0.05 indicate that the NPL has no significant effect on bank health. This means that hypothesis 2 is rejected. Statistical analysis shows the effect of CAR on the health of the bank obtained beta (B) in the CAR marked positive with a value of 0.067. Test significance

value is obtained for 0.430. Significance values greater than 0.05 indicate that CAR does not have a significant effect on bank health. This means that hypothesis 3 is rejected (Table 9).

Table 9: Hypothesis testing

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	NIM	-.550	.506	1.182	1	.277	.577
	NPL	.609	.516	1.394	1	.238	1.838
	CAR	.067	.085	.623	1	.430	1.069
	OEOI	-1.172	.705	2.766	1	.096	.310
	LDR	-.050	.154	.106	1	.745	.951
	GCG	-11.222	5.628	3.976	1	.046	.000
	Constant	140.867	84.285	2.793	1	.095	1.505E61

a. Variable(s) entered on step 1: NIM, NPL, CAR, OEOI, LDR, GCG.

The results of testing the effect of OEOI on bank health were obtained beta (B) on OEOI with a negative value of -1,172. The t value of the significance of the test was obtained at 0.096. Significance values greater than 0.05<0.10. This shows that OEOI has a significant effect on bank health at the level of 10%. This means that hypothesis 4 is accepted. Moreover, the effect of LDR on bank health were obtained beta (B) in the LDR with a negative value of -0.050. The value of the significance of the test is obtained at 0.745. Significance values greater than 0.05 indicate that the LDR has no significant effect on bank health. This means that hypothesis 5 is rejected. Finally, the testing results the effect of GCG on bank health shows the negative coefficient of -11,222. Test significance value was obtained at 0.046. Significance values smaller than 0.05 indicate that GCG has a significant effect on bank health. This means that hypothesis 6 is accepted (Table 9).

The logistic regression equation can be written as follows:

$$\mathbf{Ln = \frac{P}{1-p} = 140.867 - 0.550\ NIM + 0.609\ NPL + 0.067\ CAR - 1.172\ OEOI - 0.050\ LDR - 11.222\ GCG}$$

5. Discussion

The results of testing hypothesis 1 found that NIM did not have a significant effect on the health of the bank. This shows that the condition of the larger NIM in one period does not directly provide better bank health. Based on statistical data, it is found that the NIM conditions at banks with a health level that is less healthy at 6.9007% actually show greater than that of healthy banks which is 6.6371%. The fundamental reason for not obtaining a significant influence from the NIM on bank health is related to the structure of profits from banking companies derived from income from bank loan interest. Thus, a large NIM is the main source of profits obtained by the bank. However, the value of interest income in the NIM has not been reduced by the cost of the bank so that the large value of NIM is more likely to allow relatively low net income.

The results of testing the second hypothesis found that the NPL did not have a significant effect on the health of the bank. This means that the condition of a larger NPL in one period is uncertain giving a decrease in the health of the bank. Based on statistical data, it was found that the NPL conditions at banks with unhealthy health levels of 5.99% showed

greater than those in healthy banks at 2.70%. The fundamental reason for not obtaining a significant influence from NPL on bank health is related to the quality of financing or funding provided by a bank. In this case, credit distribution is the main source of bank income. On the other hand, the existence of bad credit will at least be able to reduce the turnover of working capital from the bank. When the bank has a high amount of bad credit, the bank will try to evaluate their performance first by temporarily stopping the distribution of credit until the bad credit decreases.

The results of testing the third hypothesis found that CAR does not have a significant effect on the health of the bank. This shows that the condition of a larger CAR in one period does not directly determine the health of the bank. The fundamental reason for not getting a significant effect from CAR on bank health is related to the bank's efforts to look at strengthening its capital adequacy. To strengthen bank capital, it seems that the bank will focus on the position of their assets to be maintained and have a low risk. This happened because of the Bank Indonesia regulation concerning the Capital Adequacy Ratio (CAR) which stated that the Commercial Bank Capital Adequacy Ratio (CAR) was at least 8%. Because the bank's main capital is actually trust, while the 8% Capital Adequacy Ratio (CAR) is only intended by Bank Indonesia to adjust conditions with international banking. Public trust in the banking world is also due to the fact that there are factors in the government's guarantee of funds held in banks. If we look at the empirical conditions of the object of research, it will appear that most banks have a much greater Capital Adequacy Ratio (CAR) than 8% or even more than 30%.

The results of testing the fourth hypothesis found that OEOI had a significant effect on bank health at the level of 10%. This shows that the higher the level of bank financing costs can provide a decrease in bank health. Based on statistical data, it was found that OEOI conditions at banks with unhealthy health levels of 98.69 showed higher than those in healthy banks at 80.04%. The rating of the bank's health carried out by Infobank magazine found that the health of the bank was directly related to the OEOI obtained by the bank in the same year. The high burden of bank operational costs that are borne by banks will generally be borne on the income obtained from the allocation of credit usage. Higher credit costs or costs will reduce the capital and profits owned by the bank. The high OEOI conditions in one period can indeed increase bank expenditures so that it has the potential to reduce profits.

The test results found that the LDR did not have a significant effect on the health of the bank. This means that the condition of a larger LDR in one period did not have a direct impact on the health of the bank in the same period. Banks that have large financing show large credit disbursements. Large credit distribution which is offset by the income or withdrawal of funds from the community in the form of savings or deposits will provide benefits to the bank. This means that in general banks will maintain the LDR for quite a large amount because large financing in banks is one of the sources of bank income. On the other hand, LDR that is too low indicates the bank's inability to channel their credit, so that in this case banks will generally increase funding while increasing their deposits from sources of public funds.

The test results found that GCG had a significant effect on the health of the bank. This means that better GCG implementation in one period has a direct impact on the health of banks in the same period. Banks that have a large GCG implementation show that the bank's commissioners and audit committees make several efforts to supervise the directors so that they are expected to be effective and efficient in carrying out their operational activities.

Supervision carried out gives a quick impact in changing so as to make bank effectiveness better.

6. Conclusion

The results of data analysis using logistic regression indicate that several variables have a significant effect on the health of the bank. Ratio efficiency has a significant effect and negatively affects the health of the bank. This means that when a bank with a high OEOI will increase the probability of the bank becoming unhealthy. GCG has a significant influence and a negative effect on the health of the bank. This means that better implementation of GCG will reduce the likelihood of banks becoming unhealthy. On the other hand, NIM has no significant influence and has a positive effect on the health of the bank. the NPL variable does not have a significant effect and has a negative effect on the health of the bank. CAR variable does not have a significant effect and has a positive effect on bank health. The LDR variable has no significant effect and has a negative effect on the health of the bank.

This study has limitations due to bank health surveys that reflect banking conditions in the previous year. Thus, using research similar to predictors will likely provide results that reflect dependent and independent relationships. In addition, a small R square value (0.501) indicates that there are still many other factors that affect the bank's health probability but have not been tested in this study. Further research can be done by modifying the testing method using a period of up to 1 to 2 years. This is considering that the decline in bank health conditions can occur in the long term. Future studies are also suggested to add other research variables that can explain the probability of a bank's health such as Interest Risk Ratio (IRR).

7. References

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