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The influence of CAR, LDR, OER, and Bank Size on NPL mediated by GCG in KBMI III and IV

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ABSTRACT

The objective of this research is to examine how CAR, LDR, OER, and bank size affect NPL. By considering the role of GCG as a mediating or intervening variable, this research will do so. This research involves commercial banks in Indonesia whose populations fall into the KBMI categories 3 and 4, and the sample consists of 13 banks. This study uses panel data regression. The analysis results show that CAR and bank size do not have a significant impact on NPL, whereas LDR, OER, and GCG have a significant impact. These results indicate that liquidity management and operational efficiency play an important role in controlling credit risk. In addition, the implementation of good GCG can improve the quality of banking credit. Therefore, to reduce credit risk and enhance financial stability, banks must strengthen corporate governance.

INTRODUCTION

Banking Law No. 10 of 1998, an amendment to Law No. 7 of 1992, is one of the laws that defines credit or financing in Indonesia. According to Article 1 Paragraph (11), credit is defined as follows: “the provision of money or bills that can be equated with it, based on the agreement or understanding of borrowing and lending between the Bank and another party that obliges the borrower to repay their debt after a certain period with the provision of interest, or in another form …”

According to (Eston et al., 2024) credit is the main asset of a bank that can affect the profitability of a bank, so it is necessary to control the impact of credit. The health of a credit is reflected in the NPL ratio faced by financial entities. A decreasing NPL ratio indicates a reduction in problematic or non-performing loans, signalling an improvement in the bank's operational condition. According to the international Basel standards, non-performing loans are also defined as loans that no longer generate income or have exceeded a certain overdue period of 90 (ninety) days, while in Indonesia, according to POJK No. 40/POJK.03/2019, non-performing loans are defined as "loans or credits with principal and/or interest arrears that have exceeded 180 (one hundred eighty) days. POJK No. 12/POJK.03/2020 regulates that KBMI III and IV are banks with a minimum core capital of 14 trillion to over 70 trillion. With such capital classifications, banks falling into these categories require more in-depth research to identify the factors that may impact NPL.

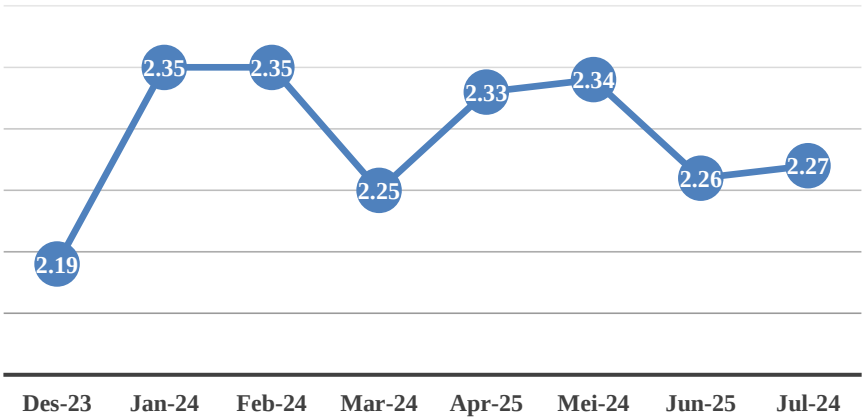

Figure 1 Development Level of NPL in Commercial Banks

Based on the image above, there is a gap phenomenon referring to the fluctuation of non-performing loans with an upward trend in the group of commercial banks. These conditions could be caused by changing credit quality, bank risk management strategies, and macroeconomic factors. The above gap phenomenon suggests that fluctuations in non-performing loans must be monitored, as they can indicate changes in the financial condition of banks and the economy as a whole. In the financial industry, NPL has a close relationship with several financial ratios, such as CAR, LDR, OER, and bank size.

CAR functions as an indicator of a banking institution's ability to anticipate potential losses due to credit risk, including those caused by NPL. According to POJK No. 11/POJK.03/2016, the Minimum Capital Requirement (KPMM) ratio is between 8% and 14%, adjusted according to the risk profile of a bank. According to (Hulu & Siswanti, 2023) the increasing NPL rate also raises the risk borne by financial institutions; thus, banks with a high NPL ratio require a strong CAR to maintain their overall financial stability and well-being. Research by (Rahman et al., 2023) states that CAR has a positive impact on NPL, while (Suryani et al., 2021) found a negative impact, and (Wulandari et al., 2021) reported that CAR does not affect NPL.

NPL also has a close relationship with LDR. Based on PBI No. 12/19/PBI/2010 Article 1 paragraph (7), it states, "LDR, hereinafter referred to as LDR, is the ratio of credit extended to third parties in rupiah and foreign currencies Commercial banks have a lower and upper limit for the LDR based on PBI No. 12/19/PBI/2010, Article 10 paragraph (1a dan 1b), with the lower limit set at 78% and the upper limit at 100%. According to (Asyadiah & Hasanuh, 2023) the lower LDR has a significant negative impact on NPL. When the LDR is within a healthy range (78% - 92%), banks can utilize the available funds to selectively disburse productive credit. Well-managed credit distribution tends to improve the quality of the credit portfolio (Noor Salim & Oktavia Mundung, 2020). According to (Karadima & Louri, 2020) LDR has a positive effect on NPL, meaning that an increase in LDR also has the potential to increase the NPL ratio.

OER, or the Operating Expense Ratio to Operating Income Ratio (BOPO), is also one of the financial ratios related to NPL. According to POJK No. 6/POJK.03/2016, the achievement of the bank's efficiency level is measured, among other things, through the Operational Cost to Operational Income Ratio (BOPO), where the lower this ratio, the more efficient the bank's operations. According to (Suryani et al., 2021) was found that OER has a positive effect on NPL, indicating that an increase in operational efficiency is associated with an increase in non-performing loans. However, (Wulandari et al., 2021) reported that OER does not have a significant impact on NPL, implying that operational efficiency does not affect credit quality.

The factors mentioned above are internal bank factors that can affect NPL. Bank size, or the size of the bank, is also related to NPL. According to (Goklas & Thamrin, 2023) companies with larger sizes typically indicate that these companies are more mature, thus more capable of absorbing the impact of

rising NPLs. However, although large banks have advantages in scale, they also potentially have higher credit exposure, which means that an increase in NPL can have a more significant nominal impact. found that bank size has a positive influence on NPL, whereas (Boussaada et al., 2022) reported a negative influence, and (Kryzanowski et al., 2023) found no significant influence of bank size on NPL. The variation in these findings indicates the need for further research to explore how bank size can affect credit risk.

LITERATURE REVIEW

Basel Accord

The framework designed by the Basel Committee on Banking Supervision (BCBS) to enhance the stability of the global financial system is known as the Basel Accords. Credit risk management is an important part of the Basel regulations, especially Basel II and Basel III. In this framework, NPL is considered a key indicator of poor credit risk and emphasizes the importance of managing problematic credit to maintain banking health. To absorb the potential losses due to NPL, Basel requires banks to have sufficient CAR. CAR must be at least 8% according to Basel II or higher under Basel III through the implementation of capital buffers. Therefore, the Basel Accord advocates for strict supervision of NPLs to prevent systemic risks that could threaten global banking stability.

In Indonesia, OJK regulations such as POJK No. 40/POJK.03/2019 implement Basel principles to manage credit risk, including NPL. As a result, the Basel principles are crucial for the overall stability of the financial sector and international stability. They also serve as a foundation for domestic regulations in Indonesia to ensure the stability of the financial sector.

Agency Theory

Agency theory examines the relationship between the party assigning the task (principal) and the party receiving the task (agent), with a focus on how to minimize conflicts of interest between the two. Several journals relevant to agency theory cover topics such as agency costs, corporate governance, and managerial behaviour (Jensen & Meckling, 1976). Recent research supports the application of agency theory in the context of banking and corporate governance. For example, a study by (Bhagat & Bolton, 2019) found that banks with better management systems and strict shareholder oversight tend to perform better in terms of risk management and lower NPL rates.

Additionally, research conducted by (Shaikh et al., 2020) highlights that the application of agency theory in the banking context can help explain why some banks are more vulnerable to high NPLs. The study shows that bank management focused on short-term profits often tends to take unbalanced risks in lending, especially when there is pressure from shareholders to increase profits in the short term.

Signaling Theory

Signaling theory explains how parties in an economic transaction use the information they possess to send signals to other parties in order to influence their decisions. This theory was first introduced by Michael Spence (1973) and was initially used in the labor market. The party with better information in signaling theory (signal provider) tries to convince the other party (signal receiver) through observable actions or attributes. In the context of banking, signals are often associated with the disclosure of financial information, risk management policies, and the bank's credit performance. Banks can send positive signals to investors, creditors, or regulatory authorities through financial reports that show low NPL ratios, adequate capital, and healthy financial performance.

Recent research by (Hong & Kubik, 2020) shows that banks often use the disclosure of information regarding credit policies and NPL ratios as a credibility signal to investors and the market. When a bank successfully maintains a low NPL ratio, it can be considered a positive signal indicating that the bank has good credit risk management and is not taking excessive risks. On the other hand, a high NPL ratio can be a negative indication that the bank is experiencing difficulties in loan management or facing challenges due to declining credit quality.

Legitimacy Theory

The legitimacy theory was first proposed by Dowling and Pfeffer (1975) in a journal titled Organizational Legitimacy: Social Values and Organizational Behaviour, which explains that legitimacy is a process for society to accept an organization or company as a legitimate entity entitled to operate. Legitimacy is considered very important for the sustainability of an organization, as the organization must act in accordance with the customs, values, and expectations of society to be trusted and supported. In the context of banking, legitimacy is often related to compliance with regulations, transparency, and the implementation of good GCG practices. Banks that consistently and transparently implement GCG in managing NPL can gain greater legitimacy from regulators, investors, and the public. In the context of NPL, legitimacy theory states that financial institutions marked by an increasing NPL ratio may experience a decline in perceived legitimacy, as they are viewed as lacking in credit risk management.

The study conducted by (Nasution et al., 2023) underscores that banks that do not maintain NPL ratios within acceptable thresholds often face difficulties in maintaining public legitimacy, resulting in decreased trust from customers and investors. Thus, effective NPL management is crucial for banks to uphold their legitimacy in the eyes of the public and regulatory bodies. Research (Kulmie & Ibrahim, 2024) Effective corporate governance in banks enhances their ability to manage credit risk, including NPL, through better oversight and sound decision-making.

CAR affects GCG in the KBMI III and IV banking industry

CAR, or Capital Adequacy Ratio, which indicates how well a bank can bear the risk of losses, has an impact on NPL. According to POJK No. 11/POJK.03/2016, the Minimum Capital Requirement (KPMM) ratio is between 8% and 14%, adjusted according to the risk profile of a bank. Adequate CAR demonstrates the bank's commitment to good risk management, in accordance with Basel III theory. In the book (Kasmir, 2018), good capital management, which includes CAR management, reflects the bank's responsibility towards stakeholders and strengthens the bank's position as a credible and highly competitive organization. According to research (Hidayati et al., 2020) good CAR management increases investor confidence. Research (Irawati et al., 2019) shows that banks with higher CAR tend to have a positive correlation with the implementation of good GCG principles in banks in Indonesia.
H1: CAR has a positive impact on GCG in the KBMI III and IV banking industry.

LDR affects GCG in KBMI III and IV banking industry

Based on the Basel III theory, the LDR plays an important role in promoting the implementation of GCG in the banking sector, especially for banks categorized as KBMI III and IV. An ideal LDR demonstrates the bank's ability to effectively utilize third-party funds to support credit distribution without sacrificing liquidity. According to Basel III theory, the optimal LDR reflects the bank's ability to utilize third-party funds to support credit distribution. SEOJK No. 14/SEOJK.03/2017 regulates the LDR threshold. According to (Kasmir, 2018) in his book Banking Management, banks with a balanced LDR are able to maintain the trust of consumers and investors, which is an important component of GCG sustainability. The study conducted by (Khairi et al., 2024) shows that good LDR management contributes to transparency and accountability in management, which is the core of GCG implementation. This is also in line with Basel principles.
H2 : LDR has a positive impact on GCG in the KBMI III and IV banking industry.

OER negatively affects GCG in the KBMI III and IV banking industry

OER plays a significant role in supporting the implementation of GCG, especially in the banking sector, which has large operational scales and falls into the KBMI III and IV categories. According to Basel III theory, operational efficiency is an important component of operational risk management, which directly impacts good corporate governance. According to POJK 55/POJK.03/2016, which emphasizes that operational efficiency is a performance indicator that supports corporate governance, a low OER indicates that the bank is capable of managing revenue and operational costs efficiently, reflecting transparency, accountability, and good management in accordance with GCG principles.

According to (Kasmir, 2018) to enhance the competitiveness of banks, operational efficiency is referred to as the key, which aligns with the principles of GCG.

Efficiency is a comprehensive assessment of a company's performance and is an important factor that banking institutions must consider to engage in rational decision-making aimed at reducing the risk exposure they face (Endri et al., 2022). Research by (Sharma et al., 2021) found that banks with a low OER tend to be more proactive in implementing GCG practices because operational efficiency allows them to invest in good governance.

H3: OER negatively affects GCG in the KBMI III and IV banking industry.

Bank Size has a positive effect on GCG in the KBMI III and IV banking industry

Bank size is an important component in risk management, especially systemic risk that can affect financial stability, in the context of Basel III. In Indonesia, laws such as POJK 55/POJK.03/2016 require large banks to implement stricter governance through good internal supervision, transparency, and effective risk management. Larger bank size generally shows superior financial results, a phenomenon often associated with their capacity to implement stronger governance practices and GCG controls. especially in KBMI III and IV banks that have a large-scale and systemic role in the economy.

In his book (Kasmir, 2018) it is mentioned that the scale of large banks allows them to have better human resource management and more complex internal procedures, which support corporate governance. This correlation can be explained by the fact that larger banks have greater resources to allocate to governance frameworks, including extensive audit committees and boards of directors, which enhance transparency and accountability (Wahyuni & Sukartha, 2019)

H4: Bank size has a positive effect on GCG in the KBMI III and IV banking industry.

CAR affects NPL in the KBMI III and IV banking industry

According to POJK No. 11/POJK.03/2016, the Minimum Capital Requirement (KPMM) ratio is between 8% and 14%, adjusted according to the risk profile of a bank. The increase in the CAR ratio in relation to total assets indicates a reduction in the exposure to risks faced by banking entities (Endri et al., 2022). According to (Annas et al., 2024) CAR was found to have a negative effect on NPL, indicating that higher capital adequacy can reduce the level of problematic loans. This is because a higher CAR indicates a bank's better ability to absorb potential losses, thereby reducing credit risk (Asyadiah & Hasanuh, 2023; Mollah et al., 2022).

H5: CAR has a negative impact on NPL in the KBMI III and IV banking industry.

LDR affects NPL in the KBMI III and IV banking industry

Based on PBI No.12/19/PBI/2010 Article 1 paragraph (7), LDR indicates the proportion of loans to third parties, including current accounts, savings, and deposits in Rupiah and foreign currencies, as well as loans to other banks. Commercial banks have a lower and upper limit for the LDR based on PBI No. 12/19/PBI/2010 Article 10 paragraph (1a) of 78% (seventy-eight percent) for the lower limit and 100% (one hundred percent) for the upper limit. According to (Karadima & Louri, 2021; Suryani et al., 2021) LDR has a positive effect on NPL, meaning that an increase in LDR also has the potential to increase the NPL ratio.

H6: LDR has a positive impact on NPL in the KBMI III and IV banking industry.

OER affects NPL in the KBMI III and IV banking industry

According to POJK No. 6/POJK.03/2016, the achievement of the bank's efficiency level is measured through the ratio of operational costs to operational income (BOPO), where the lower this ratio, the more efficient the bank's operations. OER has a positive and significant effect on NPL, meaning that higher operational costs compared to income can increase the level of problematic loans. This is because inefficiencies in operations can lead to higher costs, which may not be sustainable if revenues do not increase proportionally (Asyadiah & Hasanuh, 2023; Pardosi et al., 2024).

H7 : OER has a positive impact on NPL in the KBMI III and IV banking industry.

Bank Size affects NPL in the KBMI III and IV banking industry

Bank size was found to have an influence on NPL in the banking sector, according to (Padmadisastra & Nurhayati, 2023), especially those included in the KBMI III and IV categories, because the large scale allows banks to have a stronger structure to manage credit risk. According to the Basel Theory, large banks must have a comprehensive risk management system that meets Basel III standards, including the ability to manage credit portfolios more carefully. Large banks in Indonesia are required to have sufficient capital to cover their credit risks, in accordance with POJK No.11/POJK.03/2016.

According to the book (Kasmir, 2018), large banks have the ability to distribute credit to more diverse sectors with more measurable risks, thereby reducing the likelihood of NPLs. The Basel III principles also emphasize the importance of diversification and credit risk management as part of the approach to maintaining the stability of large banks. This indicates that larger banks, with more resources and diversified portfolios, are better prepared to manage credit risk and thus have lower levels of problematic loans (Padmadisastra & Nurhayati, 2023).

H8: Bank size negatively affects NPL in the KBMI III and IV banking industry.

GCG influences NPL in the KBMI III and IV banking industry

GCG plays an important role in supporting credit risk management through transparent policies, comprehensive risk management, and responsible decision-making in the context of Basel Theory, particularly Basel III. Regulations such as POJK No. 55/POJK.03/2016 emphasize that transparency, accountability, and effective supervision are crucial for maintaining the quality of the credit portfolio. GCG is designed to enhance the governance and overall performance of the company. In the context of banking, effective GCG can lead to better risk management practices, which can reduce the occurrence of NPLs, especially for banks classified in the KBMI III and IV categories, which have high credit risk.

In the book (Kasmir, 2018) it is explained that good governance practices, including the separation of credit decision-making and oversight functions, help prevent moral hazard and improve the quality of bank assets. The Basel III principles also support the implementation of good governance by subordinating the functions of credit decision-making and supervision. A high GCG ratio indicates that better governance can improve financial health and potentially reduce NPL (Oktavida & Lestari, 2023).

H9: GCG has a negative impact on NPL in the KBMI III and IV banking industry.

CAR, LDR, OER, and Bank Size indirectly affect NPL through GCG

The management of CAR, LDR, OER, and bank size has a significant impact on NPL. CAR, which is a measure of the bank's capital strength, is very important for maintaining the stability of the bank and reducing risks, including credit risk that can lead to NPL. Basel III encourages the implementation of stricter CAR to ensure that banks have sufficient capital reserves to cover potential losses. The purpose of POJK No.11/POJK.03/2016 is to enhance the resilience of banks to risks by establishing minimum capital requirements for commercial banks. According to (Asyadiah & Hasanuh, 2023) CAR significantly affects NPL. LDR, which indicates the bank's ability to manage liquidity and provide credit, also plays a role in controlling NPL. Research (Karadima & Louri, 2020) explains that LDR has a positive effect on NPL. A too-high LDR can increase the risk of problematic credit, but with good GCG, banks can be more selective in distributing credit, thereby reducing NPL.

OER, which indicates the operational efficiency of a bank, can influence more effective credit portfolio management (Asyadiah & Hasanuh, 2023; Pardosi et al., 2024), explain that OER has a positive effect on NPL, while bank size, according to (Padmadisastra & Nurhayati, 2023) has a negative effect on NPL. The aforementioned studies contribute to the diversification of credit risk and enhance internal supervision that supports the implementation of GCG. Specifically, GCG plays an important role in mediating the relationship between CAR, LDR, OER, and bank size towards NPL. Therefore, good GCG enhances supervision and risk management in banks.

To maintain banking stability, Basel theory emphasizes that comprehensive risk management and strong internal oversight are necessary, especially for large banks that are more vulnerable to systemic risk. By focusing on efficiency, prudence in asset allocation, and adequate capital provision, banks can

create a robust credit risk management system. This not only enhances financial stability but also supports the sustainability of the banking sector as a whole.

H10: CAR negatively affects NPL indirectly through GCG in the KBMI III and IV banking industry.
H11: LDR negatively affects NPL indirectly through GCG in the KBMI III and IV banking industry.
H12: OER has a positive indirect effect on NPL through GCG in the KBMI III and IV banking industry.
H13: Bank size has a negative impact on NPL indirectly through GCG in the KBMI III and IV banking industry.

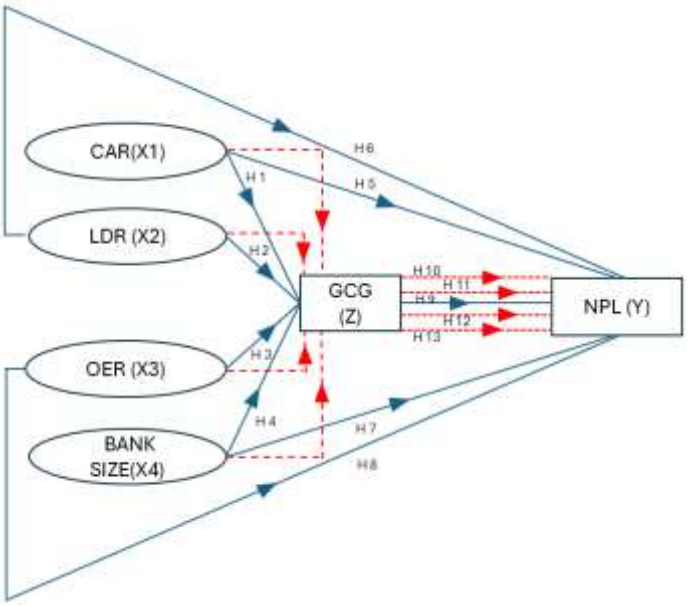

Figure 2 Research Framework

METHOD

According to (Sugiyono, 2017), the quantitative approach is used in this research to examine a specific sample or population. The main objective of this approach is to test the established hypothesis through numerical measurement and statistical analysis. Indonesian banking companies listed on the Indonesia Stock Exchange are the population used in this study, including core capital group III and IV banks, and the research period is from 2019 to 2023. POJK No.12/POJK.03/2020 which mandates the increase of core capital and the redefinition of banks from Commercial Banks for Business Activities (BUKU) to Core Capital-Based Bank Groups, must be implemented. This will enable the Financial Services Authority to conduct more efficient supervision by supporting more accurate performance and risk analysis.

Definition of Variable Operationalization and Variable Measurement

This research aims to examine the influence of the Capital Adequacy Ratio, Loan to Deposit Ratio, Operational Efficiency Ratio, and Bank Size on Non-Performing Loans with Good Corporate Governance as an intervening variable in the group of core capital banks III and IV. According to (Sugiyono, 2017), the operationalization of variables is the process of defining research variables in a form that can be empirically measured. The operationalization of variables aims to transform abstract or theoretical variables into concrete and measurable forms, thereby enabling the collection of relevant data. In quantitative research, operationalization includes determining indicators or sub-variables that represent each main variable, as well as appropriate measurement tools or methods, such as Likert scales or other numerical data. In Table 1, the variables used in this study are outlined.

Table 1 Operational Definition of Variables

Variable	Operational Definition	Formula	Scale Measurement
Non-Performing Loan (NPL)	Non-Performing Loans indicate the quality of a bank's assets, particularly related to the debtor's ability to meet their obligations; they are one of the main indicators in assessing the health of the banking sector SEOJK No 42/SEOJK03/2017 POJK No 40/POJK.03/2019 PBI No. 23/2/PBI/2021	$\boldsymbol{NPL} = \frac{Non - Performing\ Loans}{\text{Total loans}} x100\%$	Ratio
Capital Adequacy Ratio (CAR)	The capital adequacy ratio serves as an important ratio to assess the capacity of financial institutions to manage potential unexpected financial losses. According to POJK No. 11/POJK.03/2016 concerning the Obligation to Provide Minimum Capital for Commercial Banks, the Minimum Capital Requirement ratio	$\boldsymbol{CAR} = \frac{\text{Tier 1 Capital} + \text{Tier 2 Capital}}{\text{Risk} - \text{Weighted Assets}} x100\%$	Ratio
Loan to Deposit Ratio (LDR)	Loan to Deposit Ratio is a ratio that shows the amount of funds given as credit compared to the total third-party funds (DPK) collected by the bank. According to POJK No 18/POJK.03/2016 concerning Macroprudential Liquidity Ratio (RIM), it regulates the LDR	$\boldsymbol{LDR} = \frac{\text{Total Loans}}{\text{Total Deposits}} x100\%$	Ratio
Operational Efficiency Ratio (OER)	Operational Efficiency Ratio is a financial ratio commonly used in the banking industry to assess the operational efficiency of a bank. Bank Indonesia Regulation No. 15/12/PBI/2013 stipulates that the ideal standard for a healthy Operational Efficiency Ratio is below 85%	$\boldsymbol{OER} = \frac{\text{Operating Expenses}}{\text{Operating Income}} x100\%$	Ratio
Bank size (BS)	Bank size, or bank size, refers to the total assets owned by a bank, which is often used as an indicator of the bank's strength and operational capacity. Referring to the Financial Services Authority Regulation No. 12/POJK.03/2020	$\boldsymbol{Bank\ Size} = Ln(Total\ Assets)$	Ratio
Good Corporate Governance (GCG)	GCG serves to instil trust in the public and investors by strengthening the oversight and accountability systems within the company. The main principles of good corporate governance include transparency, accountability, responsibility, independence, and fairness. All these elements play a role in strengthening a positive reputation and generating sustainable value for the company. GCG is also believed to minimize the risk of deviations and improve the company's financial and non-financial performance	In accordance with POJK No 55/POJK.03/2016 SEOJK No. 13/SEOJK.03/2017 • Rank 1 (Best) → 1.00 • Rank 2 → 0.80 • Rank 3 → 0.60 • Rank 4 → 0.40 • Rank 5 (Worst) → 0.20	Score

Source: Data processing results by the author, 2024

The population in KBMI III and IV during the period from 2019 to 2023 consists of 17 banks. The research sample is a part of the quantity and characteristics present in that population (Sugiyono, 2017).

A sample is a part of the quantity and characteristics possessed by a population (Sugiyono, 2017). This research uses sampling techniques, specifically non-probability sampling.

Table 2 Sample Selection Criteria

No	Criteria	Total Bank
1	General Banks KBMI III and IV during the period 2019-2023	17
2	General Banks KBMI III and IV not listed on the IDX during the period 2019-2023	(2)
3	General Banks KBMI III and IV during the period 2019-2023, whose annual reports are not available during the period 2019-2023	(1)
4	General Banks KBMI III and IV that became Islamic banks during the period 2019-2023	(1)
Total Sample Used		13

In this study, the data collection method used is the documentation method with secondary data sources, which are data obtained by the researcher indirectly through intermediaries (Sugiyono, 2017). The data collection methods in this study are the library study method and documentation. Library study method, which is a method used to obtain information through the examination of various written sources, including reference materials, academic journals, scientific articles, and research papers. Documentation methodology, which refers to the systematic data collection in the form of information sourced from important records belonging to institutions, organizations, or individuals. The documentation techniques related to this research include annual reports and GCG reports, which are disseminated through the websites of each group of core capital III and IV banks in Indonesia during the period from 2019 to 2023. In addition, additional statistical data and applicable legal regulations for the bank were obtained through the website of the Financial Services Authority (OJK).

RESULT AND DISCUSSION

Descriptive Analysis

Table 3 results descriptive statistical analysis describes the data that serves as the research variables in general and produces information such as the mean, median, mode, and minimum and maximum values of the research data (Kurniawan et al., 2021).

Table 3 Results of Descriptive Analysis

	NPL_Y (%)	CAR_X1 (%)	LDR_X2 (%)	OER_X3 (%)	BS_X4 (%)	GCG_Z (score)
Mean	2.616769	24.51338	87.32723	75.81154	33.55538	0.873846
Median	2.800000	24.02000	84.25000	77.96000	33.15000	0.800000
Maximum	4.780000	38.70000	163.0000	98.12000	35.32000	1.000000
Minimum	0.800000	16.80000	60.04000	43.80000	32.16000	0.800000
Std. Dev.	0.887423	4.586239	18.64488	11.67501	0.918406	0.097270
Observations	65	65	65	65	65	65

Source: Data processed with EViews13, 2024

Selection of Panel Data Regression Method

Table 4 results based on the results of the Chow test, the Hausman test, and the Lagrange Multiplier (LM test) conducted on Regression Model 1, Regression Model 2, and Regression Model 3, the following results were found :

Table 4 Results of Model Selection

Regression Model 1				
Test	**Test Criteria**	**Statistics**	**P-Value**	**Conclusion**
Chow	*Cross-section Chi square*	186.657258	0.0000	*Fixed Effect Model*
Hausman	*Cross-section random*	4.179044	0.3823	*Random Effect Model*
Lagrange Multiplier (LM test)	*Cross-section Breusch-Pagan*	87.94025	0.0000	***Random Effect Model***
Regression Model 2				
Test	**Test Criteria**	**Statistics**	**P-Value**	**Conclusion**
Chow	*Cross-section Chi square*	48.021570	0.0001	*Fixed Effect Model*
Hausman	*Cross-section random*	3.620042	0.4599	*Random Effect Model*
Lagrange Multiplier (LM test)	*Cross-section Breusch-Pagan*	14.09168	0.0002	***Random Effect Model***
Regression Model 3				
Test	**Test Criteria**	**Statistics**	**P-Value**	**Conclusion**
Chow	*Cross-section Chi square*	61.668149	0.0000	*Fixed Effect Model*
Hausman	*Cross-section random*	0.454158	0.5004	*Random Effect Model*
Lagrange Multiplier (LM test)	*Cross-section Breusch-Pagan*	33.88288	0.0000	***Random Effect Model***

Source: Data processed with EViews13, 2024

Classic Assumption Test

The classical assumption test is used to assess whether there are issues related to classical assumptions in a regression model (Ghozali, 2018). In this study, the classical assumption tests conducted were only the multicollinearity test and the heteroscedasticity test, with results showing that in each regression model, namely model 1, model 2, and model 3, no multicollinearity or heteroscedasticity was found.

Model Feasibility Test

Coefficient of Determination R^2

The feasibility of the model is measured by calculating the coefficient of determination, or R^2 statistic, which describes how well the independent variables can explain the dependent variable. Below is the table 5 of the coefficient of determination for regression model 1, regression model 2, and regression model 3.

Table 5 Coefficient of Determination

Regression Model	**(R-squared)**	**Explanation**
Regression Model 1	0.113632	The variables CAR, LDR, OER, and BS have a contribution to explaining GCG of 11% (eleven percent). The remaining 89% (eighty-nine percent) is influenced by variables outside of that.
Regression Model 2	0.555841	The CAR, LDR, OER, and BS variables contribute to explaining NPL by 55% (fifty-five percent), while the remaining 45%

		(forty-five percent) is influenced by external variables.
Regression Model 3	0.099780	The GCG variable contributes to explaining NPL by 9.9% (nine point nine percent). the remaining 90.1% (ninety point one percent) is influenced by variables outside of that

Source: Processed data

F Statistic Test

The F-test is conducted to determine the simultaneous effect of independent variables on the dependent variable. The Joint Regression Coefficient Test (F-test) is conducted by examining the Prob (F-statistic) data and comparing it with α of 0.05. Below is the F-statistic test table 6 for regression model 1, regression model 2, and regression model 3.

Table 6 F-Test Statistics Table

Regression Model	F-statistic	Prob (F-statistic)	F-table	Explanation
Regression Model 1	1,713181	0,158894	2,525215	$F_{calculated} < F_{table}$ and Prob(F-statistic) > 0.05, Then the result is not significant
Regression Model 2	**15,88608**	**0,000000**	**2,370977**	$F_{calculated} > F_{table}$ and Prob(F-statistic) < 0.05, **Then the result is significant**
Regression Model 3	**6.982856**	**0.010369**	**3,993364924**	$F_{calculated} > F_{table}$ and Prob(F-statistic) < 0.05, **Then the result is significant**

Source: Data processed with EViews13, 2024

Hypothesis Testing

Partial Test (t-test)

Table 7 is the Partial Test (t-test) The Partial t-test or Wald Test is conducted to analyse the impact of independent variables separately on the dependent variable. The Partial t Test or Wald Test is conducted to analyse the impact of independent variables separately on the dependent variable. Independent variables individually are said to have a significant influence on the dependent variable with probability if the p-value (sig) is less than the significance level (α). The significance level applied in this study is α = 5%.

Table 7 t-Statistic Test

Description	Direct Influence	$t_{calculated}$	t_{table}	Prob	Conclusion
CAR => GCG	0.00111	0.86179	1.669	0.39220	Not Influential
LDR => GCG	0.00112	2.61568	1.669	0.01120	Significantly Positive Impact
OER => GCG	0.00068	1.17866	1.669	0.24320	Not Influential
BS => GCG	0.03585	1.41374	1.669	0.16260	Not Influential
CAR => NPL	-0.01107	-0.62747	1.669	0.53270	Not Influential
LDR => NPL	-0.01727	-3.44200	1.669	0.00110	Significantly Negative Impact

OER => NPL	0.06049	7.99914	1.669	0.00000	Significantly Positive Impact
BS => NPL	0.30112	2.15774	1.669	0.03500	Significantly Positive Impact
GCG => NPL	-4.17954	-2.63104	1.669	0.01070	Significantly Negative Impact

Source: Data processed with EViews13, 2024

Sobel Test

The Sobel test is also used to determine whether GCG (Z) serves as an important mediator in the relationship between CAR (X1), LDR (X2), OER (X3), Bank Size (X4), and NPL (Y). The Sobel test involves comparing the Z value of the coefficients X1, X2, X3, X4, and Y with the table Z value, which is 1.96 for a significance level of 0.05 and 1.28 for a significance level of 0.1. If the calculated Z value is greater than the table Z value, then mediation effect has occurred (Ghozali, 2018). Table 8 is the result of the Sobel test :

Table 8 Sobel Test

Description	Direct Influence	Indirect Influence	Total Influence	Z_{Sobel}	Results	Conclusion
CAR =>GCG =>NPL	-0.01107	-0.00464	-0.01571	-0.8189	$Z_{Sobel} < 1{,}96^{*}$	Not Influential
LDR =>GCG =>NPL	-0.01727	-0.00466	-0.02193	-1.8556	$Z_{Sobel} < 1{,}96^{*}$ $Z_{Sobel} < 1{,}28^{**}$	Not Influential/ Negatively Influential**
OER =>GCG =>NPL	0.06049	-0.00285	0.05764	-1.0749	$Z_{Sobel} < 1{,}96^{*}$	Not Influential
BS =>GCG =>NPL	0.30112	-0.14984	0.15128	-1.2454	$Z_{Sobel} < 1{,}96^{*}$	Not Influential

** Significant value of 10%
Source: Data processed

Discussion of Research Results

The effect of CAR on GCG in the KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of CAR on GCG, the research findings indicate that CAR does not affect GCG. This finding is supported by a t-statistic coefficient of 0.86179 < t-table = 1.669 and a p-value of 0.39220 > 0.05. The results of this study identify that the CAR variable can be disregarded in its influence on GCG, and it can be concluded that H1 is rejected. The results of this study are not in line with (Hidayat, 2019; Irawati et al., 2019) which revealed that good and higher CAR management is positively correlated with the implementation of good GCG principles in banks in Indonesia.

The results of this study are not in line with (Hidayat, 2019; Irawati et al., 2019) who revealed that better and higher CAR management is positively correlated with the implementation of good GCG principles in banks in Indonesia.

The Influence of LDR on GCG in KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of LDR on GCG, the research findings indicate that LDR has an effect on GCG. This finding is supported by a t-statistic coefficient of 2.61568 > t-table = 1.669 and a p-value of 0.0186 < 0.05. The results of this study identify the LDR variable as having a significant positive effect on GCG, and it can be concluded that H2 is accepted. The results of this study are in line with the research conducted by (Arsew et al., 2020) which shows that LDR management has a significant positive impact on the implementation of GCG.

The Influence of OER on GCG in KBMI III and IV Banking Industry

According to the results of the hypothesis test aimed at determining the effect of OER on GCG, the research findings indicate that OER does not affect GCG. This finding is supported by a t-statistic coefficient of 1.17866 < t-table = 1.669 and a p-value of 0.24320 > 0.05. The results of this study identify that the OER variable can be disregarded in its influence on GCG, and it can be concluded that H3 is rejected. The results of this study are not in line with (Khairi et al., 2024) which shows that good LDR management contributes to transparency and accountability in management, which are the core of GCG implementation.

The Influence of Bank Size on GCG in the KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of bank size on GCG, the research findings indicate that bank size does not have an effect on GCG. This finding is supported by a calculated t coefficient of 1.41374 < t table = 1.669 and a p value of 0.16260 > 0.05. The results of this study identify that the bank size variable can be disregarded in its influence on GCG, and it can be concluded that H4 is rejected. The results of this study are not in line with Wahyuni & Sukartha, 2019) which explains that larger banks have more resources to allocate to the governance framework.

The Influence of CAR on NPL in the KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of CAR on NPL, the research findings indicate that CAR does not affect NPL. This finding is supported by a t-statistic coefficient of -0.62747 < t-table = 1.669 and a p-value of 0.53270 > 0.05. The results of this study identify that the CAR variable can be disregarded in its influence on NPL, and it can be concluded that H5 is rejected. The results of this study are not in line with (Annas et al., 2024; Asyadiah & Hasanuh, 2023) According to the results of the hypothesis testing aimed at determining the effect of CAR on NPL, the research findings indicate that CAR does not affect NPL. This finding is supported by a t-statistic coefficient of -0.62747 < t-table = 1.669 and a p-value of 0.53270 > 0.05. The results of this study identify that the CAR variable can be disregarded in its influence on NPL, and it can be concluded that H5 is rejected. The results of this study are not in line with.

The Influence of LDR on NPL in KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of LDR on NPL, the research findings indicate that LDR affects NPL. This finding is supported by a t-statistic coefficient of -3.44200 > t-table = 1.669 and a p-value of 0.00110 < 0.05. The results of this study identify the LDR variable as having a significant negative impact on NPL, and it can be concluded that H6 is accepted. The results of this study are in line with the research by Karadima & Louri (2020), which shows that optimal LDR management can have a significant negative impact on the control level of NPL. The results of this study are in line with the research by (Karadima & Louri, 2020 which shows that optimal LDR management can have a significant negative impact on the level of NPL control.

The influence of OER on NPL in KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of OER on NPL, the research findings indicate that OER has an effect on NPL. This finding is supported by a t-statistic coefficient of 7.99914 > t-table = 1.669 and a p-value of 0.0000 < 0.05. The results of this study identify the OER variable as having a significant positive effect on NPL, and it can be concluded that H7 is accepted. The results of this study are in line with the research by (Asyadiah & Hasanuh, 2023) which shows that the level of operational efficiency can have a significant positive impact on the control of NPL

The Influence of Bank Size on NPL in the KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of bank size on NPL, the research findings indicate that bank size has an effect on NPL. This finding is supported by a t-statistic coefficient of 2.15774 > t-table = 1.669 and a p-value of 0.03500 > 0.05. The results of this study identify the bank size variable as having a significant positive effect on NPL, and it can be concluded that H9 is rejected. The results of this study are not in line with (Padmadisastra & Nurhayati, 2023) where larger banks, with more resources and diversified portfolios, are better equipped to manage credit risk and thus have lower levels of problematic loans.

The Influence of GCG on NPL in KBMI III and IV Banking Industry

According to the results of the hypothesis testing aimed at determining the effect of GCG on NPL, the research findings indicate that bank size has an impact on NPL. This finding is supported by a t-statistic coefficient of -2.63104 > t-table = 1.669 and a p-value of 0.0107 < 0.05. The results of this study identify that the GCG variable has a significant positive effect on NPL, and it can be concluded that H5 is accepted. The results of this study are in line with the research by (Oktavida & Lestari, 2023) which shows that the implementation of GCG can have a significant positive impact on the implementation of NPL.

The influence of CAR on NPL indirectly through GCG in the KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of CAR on NPL through GCG as an intervening variable, the research findings indicate that GCG does not mediate the effect of CAR on NPL. This finding is supported by

- The calculated Z coefficient of -1.077 < Z table = 1.96, or
- The calculated Z coefficient of -1.077 < table Z = 1.28

Even though the GCG level is good, it has not yet mediated the effect of CAR on NPL. The results of this study identify that the intervening variable GCG has not been able to mediate the influence of CAR on NPL, and it can be concluded that H10 is rejected. Research related to the influence of CAR on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

Research on the influence of CAR on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

The influence of LDR on NPL indirectly through GCG in the KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of LDR on NPL through GCG as an intervening variable, the research findings indicate that GCG does not mediate the effect of LDR on NPL. This finding is supported by

- The calculated Z coefficient is -1.655 < Z table = 1.96. But for
- The calculated Z coefficient of -1.655 > Z table = 1.28 indicates that GCG mediates the influence of LDR on NPL.

Even though the LDR in this study is high, the NPL rate can still be controlled by the bank's management. Even though GCG reflects a good average value, it has not yet been able to mediate the relationship between LDR and NPL. The results of this study identify that the intervening variable GCG has not yet been able to mediate the influence of LDR on NPL, and it can be concluded that H11 is rejected. Research related to the influence of LDR on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

Research related to the influence of LDR on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

The influence of OER on NPL indirectly through GCG in the KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of OER on NPL through GCG as an intervening variable, the research findings indicate that GCG does not mediate the effect of OER on NPL. This finding is supported by

- the calculated Z coefficient of -0.729 < Z table = 1.96, or
- The calculated Z coefficient is -0.729 < table Z = 1.28

The results of this study identify that the intervening variable GCG has not been able to mediate the effect of OER on NPL, and it can be concluded that H12 is rejected. Research related to the influence of OER on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

Research related to the influence of OER on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

The influence of Bank Size on NPL indirectly through GCG in the KBMI III and IV banking industry

According to the results of the hypothesis testing aimed at determining the effect of bank size on NPL through GCG as an intervening variable, the research findings indicate that GCG does not mediate the effect of bank size on NPL. This finding is supported by

- the calculated Z coefficient of -1.005 < Z table = 1.96, or
- the calculated Z coefficient of -1.005 < table Z = 1.28

The results of this study identify that the intervening variable GCG has not been able to mediate the influence of bank size on NPL, and it can be concluded that H13 is rejected. Research related to the influence of bank size on NPL mediated by GCG is still very limited; therefore, further research is needed to understand this dynamic in depth, considering that GCG is a factor that cannot be overlooked in the operation of a company, especially in the banking sector.

CONCLUSION

Based on the research findings regarding the influence of CAR, LDR, OER, and Bank Size on NPL with GCG as an intervening variable in the KBMI III and IV banking industry, several important findings were obtained. First, in terms of the direct relationship with GCG, only LDR was found to have a significantly positive impact, while CAR, OER, and Bank Size did not have any effect. These findings indicate that the efficiency of credit distribution, as reflected in the LDR, is linked to good governance practices, while capital adequacy, operational efficiency, and bank size do not yet reflect the optimal implementation of GCG. Furthermore, in relation to NPL, the LDR and GCG variables show a significant negative impact, indicating their contribution in reducing the level of problematic loans. On the contrary, OER and Bank Size have a positive effect on NPL, while CAR does not show any effect on NPL.

Furthermore, in the mediation analysis, GCG was not proven to mediate the influence of CAR, LDR, OER, or Bank Size on NPL. This indicates that although GCG plays a role in directly controlling NPL, its implementation is not yet strong enough to serve as an intermediary connecting those independent variables with NPL. Overall, these findings underscore the importance of substantially strengthening GCG practices, not just as a formality, so that they can optimally function both directly and as a mediation mechanism in improving credit quality and the stability of the banking sector.

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