



The Moderating Effect of Macroprudential Policies on the Relationship Between the Effectiveness of the Board of Directors in Shaping the Bank's Risk-Taking Behavior

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Abstract: Macroeconomic instability in 2020 caused by COVID-19 can affect the stability of the country's financial system and trigger risks to banking performance. The implementation of macroprudential policies and the effectiveness of the board of directors as policy implementers can be one of the solutions to this problem. The purpose of this study is to see how the influence of macroprudential policies and the effectiveness of the board of directors in shaping bank risk-taking behavior. The method used is panel data regression method and moderation regression with a sample of 43 banks listed on the Indonesia Stock Exchange including banks that consistently published their financial statements for the last five years. The results showed that partially only the effectiveness of the board of directors and company size affected bank risk-taking behavior, while macroprudential policies, macroprudential policies that moderate the effectiveness of the board of directors, and inflation were considered to not affect bank risk-taking behavior, this was due to differences in bank-specific characteristics, the effectiveness of corporate governance, policy implementation in the form of policy easing and tightening, and the interaction between macroprudential policies and monetary policy. However, simultaneously the independent variables and control variables have a significant influence on bank risk-taking behavior.

Keywords: Board Effectiveness; Firm Size; Inflation; Macroeconomic Instability; Macroprudential Policy; Moderation; Risk-Taking Behavior

INTRODUCTION

Macroeconomic instability can affect the stability of a country's financial system. Macroeconomics is the interaction of society that can cause global phenomena, such as inflation and economic growth (Dufrénot, 2023). One of the instruments used by the government in dealing with this problem is banking a financial service institution that functions to maintain financial system stability. Research reviewed by Guerrieri & Harkrader (2021) states that the factors that influence macroeconomics on bank performance include gross domestic product (GDP) and inflation. The following are Indonesia's GDP and inflation conditions over the past five years.



Figure 1. Indonesia's GDP 2018-2022

Source: Bank Indonesia Economic Report (2023)

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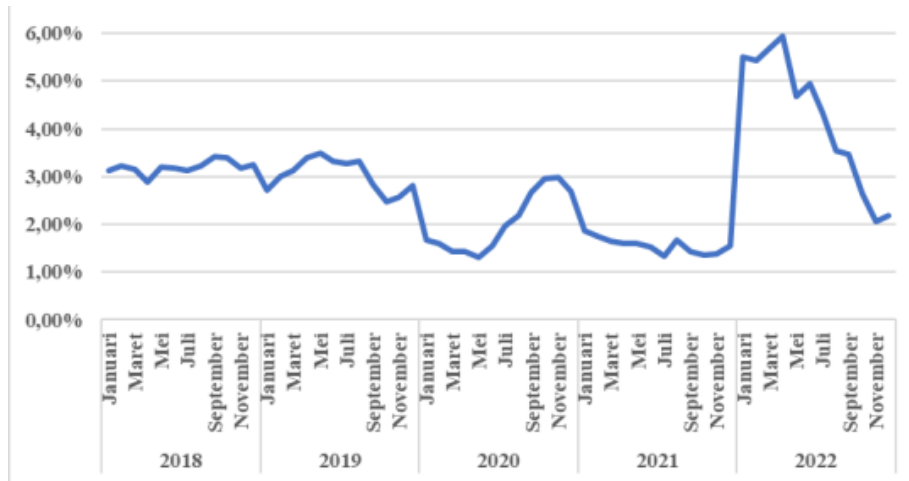


Figure 2. Indonesia inflation 2018-2022
 Source: Bank Indonesia (2023)

Based on the condition of Indonesia's GDP and inflation rate over the past five years, it can be concluded that Indonesia's macroeconomy is in an unstable state in 2020 where the instability of GDP and inflation that occurs simultaneously will affect macroeconomic stability which impact on the stability of the country's financial system Dufrenot (2023) and triggers risks in banking Guerrieri & Harkrader (2021). This can be seen from the risk indicators in the form of Risk Weighted Assets (RWA), Loan Deposit Ratio (LDR), and Non-Performing Loan (NPL) instruments.

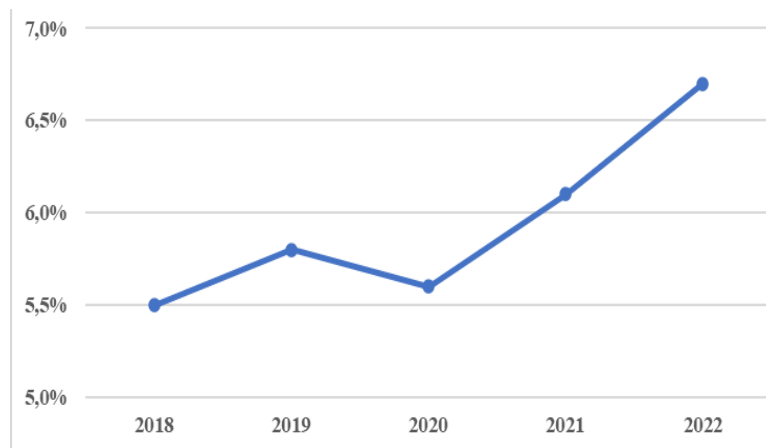


Figure 3. RWA 2018-2022
 Source: OJK Statistical Report (2023)

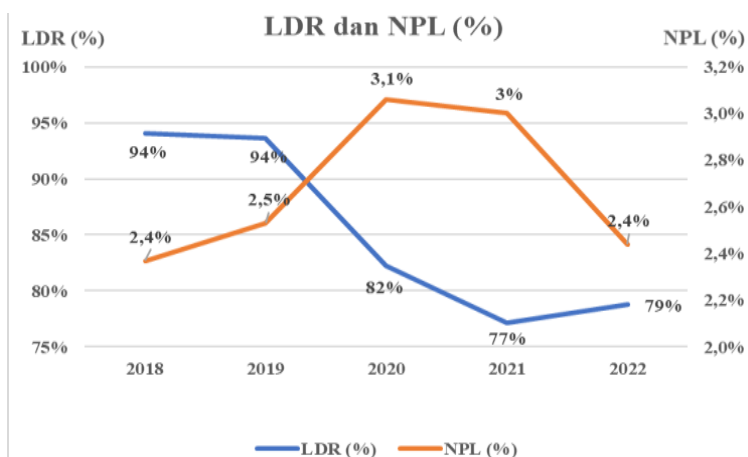


Figure 4. LDR and NPL 2018-2022

Source: OJK Annual Report (2023)

Based on the graphs of Indonesia's RWA, LDR, and NPL for the last five years, risk indicators show a decline in bank performance as the country's financial intermediary institution in 2020. This phenomenon is in line with research researched by Guerrieri & Harkrader (2021) that the macroeconomy affects banking performance so that banks experience risk exposure which can be seen from the minimum capital provider for banks (RWA) has decreased, lending risk (LDR) has decreased, and liquidity risk (NPL) has increased in 2020.

However, the RWA, LDR, and NPL graphs have increased along with the policies implemented by Bank Indonesia as a banking financial regulator, one of which is implementing macroprudential policies as an instrument that restrains systemic risk and mitigates the potential adverse economic impact of financial instability (Agénor et al., 2019). In line with these findings, the most applied prudential policy period at the beginning of the year in developing countries is macroprudential policy which aims to mitigate and prevent future bank risk-taking behavior in improving financial stability (Salim & Surtoto, 2023).

In addition, in maintaining the country's financial stability through macroprudential policies, there needs to be effective and efficient collaboration between policies and policy implementers, such as the board of directors (Basty et al., 2023). The effectiveness of risk decisions made by board members can mitigate bank risk-taking behavior (Mollah et al., 2021). Furthermore, other studies discuss that excessive risk-taking can be minimized by leadership with dual roles, such as the CEO and the board of directors (Hasan et al., 2020). Another effort to minimize excessive risk-taking can be achieved by placing women in top management, as women are perceived to be more risk-averse than men. According to the research by Felício et al. (2018), the board of directors is seen as an internal governance structure responsible for establishing a good and effective risk management system. The more fulfilled the attributes of the board of directors are, the better it is considered capable of enhancing the mitigation behavior of bank risk-taking.

This shows that macroprudential policy affects the risk-taking behavior of banks in setting limits on risk-taking decisions by the board of directors to maintain the country's financial stability. This is in line with the research of Basty et al. (2023) which states that there is a significant influence between macroprudential policy and board effectiveness on bank risk-taking behavior. In addition, according to research conducted by Gaganis et al. (2020), the impact of bank corporate governance on risk-taking is very dependent on the prevailing macroprudential policies.



Board of directors' members play a crucial role as policy implementers, one of which is making risk decisions within the bank. The effectiveness of risk decisions made by board members can influence the company's readiness to manage risks, and the size of the company plays a role in the complexity of decision-making and the scale of risks faced. The size of a company can influence various operational aspects, such as financial performance, financial policies, corporate governance, dividend policies, compensation policies, investment policies, diversification, as well as mergers and acquisitions. The larger the company, the more important the role of the board of directors becomes in guiding strategy and risk management (Belani & Sinta, 2023) (Hashmiet al., 2020).

The vulnerability of the financial services industry to crises or pandemics in a country means that risk management must be seen from both the internal and external aspects of the company. For this reason, this research is important to determine the impact of risk management on the banking industry. This researcher aims to analyze the implications for bank regulators and policy implementers that responses to tightening and loosening policies can have an impact on risk-taking behavior so it is necessary to pay attention to external company factors such as inflation and internal company factors such as company size. This is what is new in this research.

Based on the above explanation, it can be concluded that the Financial Services Authority (Otoritas Jasa Keuangan), the central bank, and the board of directors as risk overseers collaborate in managing the country's economic risk through the implementation of policies issued by Bank Indonesia to make effective and efficient risk decisions in creating stability in the country's financial system. Therefore, policies and the effectiveness of the board of directors play a crucial role in making risk decisions. This aligns with research conducted by Basti et al. (2023) that the interaction of macroprudential policies and board effectiveness can shape bank risk-taking behavior. This study is also consistent with Altunbas et al. (2018), stating that macroprudential tools have a significant impact on bank risk, indicating that macroprudential policy instruments can influence bank risk-taking behavior. Silalahi & Falianty (2023) also investigated the significant impact of monetary policy and macroprudential policy on bank risk. Additionally, Fariska et al. (2023) studied the effectiveness of macroprudential intermediation policies in influencing bank risk management mitigation. Another study by Mollah et al. (2021) states that heterogeneity in the attributes of independent non-executive directors (INED) can significantly mitigate bank risk-taking behavior.

The purpose of this research is to find out the effect of macroprudential policies, board effectiveness, macroprudential policies that moderate board effectiveness, firm size, and inflation on bank risk-taking behavior. Based on the theory and the outcomes of the numerous investigations, the following hypotheses can be developed:

Hypothesis 1: The Effectiveness of the Board of Directors Significantly Influences Bank Risk-Taking Behavior.

Hypothesis 2: Macroprudential Policies Significantly Influence Bank Risk-Taking Behavior.

Hypothesis 3: Macroprudential Policies Moderate the Influence of the Effectiveness of the Board of Directors on Bank Risk-Taking Behavior.

Hypothesis 4: Inflation Significantly Influences Bank Risk-Taking Behavior.

Hypothesis 5: Company Size Significantly Influences Bank Risk-Taking Behavior.

Hypothesis 6: The Simultaneous Influence of the Effectiveness of the Board of Directors, Macroprudential Policies, Macroprudential Policies Moderating the Influence of the Board of Directors, Inflation, and Company Size Significantly Affects Bank Risk-Taking Behavior

METHODS

Based on the research objectives, this study uses a panel data regression method that combines sequence and cross-section data by including related variables (Pandoyo & Sofyan, 2018), and this study uses moderation regression which serves to see how far moderating factors can affect the relationship between the independent variable and the dependent variable (Tse et al., 2019). Data collection in this study used documents in the form of annual reports from the Financial Services Authority, Indonesia Stock Exchange, Bank Indonesia, and the company's official website for the period 2018-2022. Data analysis in this study used descriptive statistics, panel data regression analysis, moderation regression analysis, regression model estimation, and model selection. To evaluate the effectiveness of the regression model in this study, the next step is to conduct a classical assumption test. If the results of the classical assumption test evaluation show positive results, then the researchers conduct a partial test (T-test) and simultaneous test (F-test) to answer the research hypothesis. Also, researchers conducted a coefficient of determination test to determine the extent to which the model was able to fully explain fluctuations in the independent variable on the model.

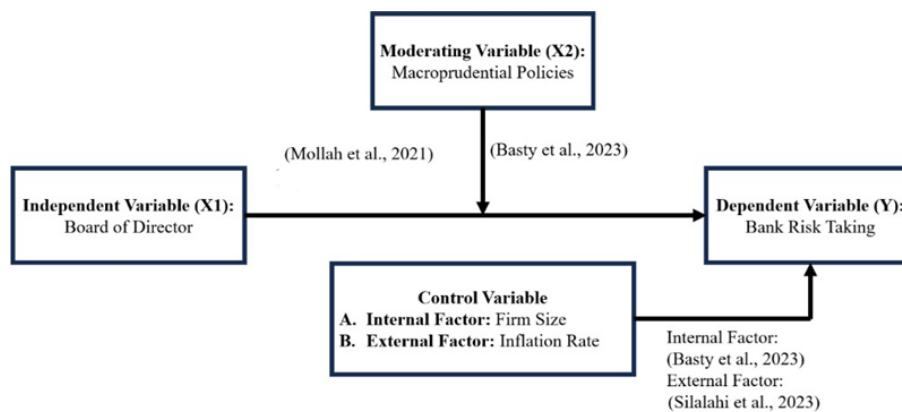


Figure 5. Framework Theory

Source: (Basty et al., 2023), Data has been processed by the author (2023)

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

According to Ghozali (2009) in Pandoyo & Sofyan (2018), the purpose of descriptive analysis is to present a description of values including mean, standard deviation, variance, maximum, minimum, total, range, kurtosis, and skewness. Descriptive statistical analysis in this study can be seen in the following table.

Table 1. Descriptive Statistics

	Bank Risk-Taking Behavior	Board of Directors Attributes	Macroprudential Policy	Inflation	Firm Size
Kurtosis	8.795478	4.466951	2.046316	3.642960	3.194132
Jarque-Bera	300.5716	56.12329	8.036596	12.51113	6.677504
Probability	0.000000	0.000000	0.017984	0.001920	0.035481
Sum	2.18E+13	1517.613	-52.00000	3.711100	2302.325
Sum Sq. Dev.	7.65E+24	2204.647	135.9704	0.013536	353.1876
Observations	135	135	135	135	135

Source: Data has been processed by the author (2023)



Based on the data that has been processed, the analysis of various financial indicators shows a diverse pattern across various aspects. In terms of banks' risk-taking behavior, the mean value of 1.62, although smaller than the standard deviation of 2.39, signifies high heterogeneity with a large variance in the data. This indicates a precarious situation, as the companies in the study sample exhibit characteristics that are vulnerable to bankruptcy based on both average behavior and the Z-Score criterion. In contrast, the board of directors attribute shows homogeneity with a mean value of 11.24 exceeding a standard deviation of 4.05, indicating a consistent pattern without significant variation. Macroeconomic policy, with a mean value of -0.38 and a heterogeneous distribution, reflects a condition of loose policy implementation. Inflation data, which shows homogeneity with a mean value of 0.02 exceeding the standard deviation of 0.01, highlights the stability of Indonesia's inflation is considered stable. Finally, company size, showing homogeneity with a mean value of 17.05 exceeding a standard deviation of 1.62, indicates stability in managing liquidity as the majority fall into the large company category.

Panel Data Model Selection

According to Pandoyo & Sofyan (2018), the Chow test, Hausman test, and Lagrange Multiplier test are methods that can be used to estimate regression models based on deep panel data. The following are the results of the panel data model selection for this study.

Chow Test

The study aims to identify the most appropriate model by comparing the common effect model and fixed effect model through the application of the Chow test. The hypotheses guiding this process are formulated as follows: H0 suggests that the Common Effect model is suitable, indicated by a p-value greater than 0.05; whereas H1 proposes that the Fixed Effect model is more fitting, signified by a p-value less than 0.05. The application of the Chow test will provide insights into the preferred model for the study, contributing to a more informed and robust analytical approach.

Table 2. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.010506	(26,104)	0.0000
Cross-section Chi-square	93.752040	26	0.0000

Source: Data has been processed by the author (2023)

It can be seen in Table 2 that the probability value of 0.000 is lower than the threshold of 0.05. Therefore, a decision is made to reject the null hypothesis (H0) based on the conclusion that the fixed effect model is more suitable than the common effect model.

Hausman Test

In the context of selecting the most suitable panel data regression model for this study, the Hausman test plays a pivotal role. This test serves the purpose of comparing the Fixed Effect model with the Random Effect model. Utilizing the Chi-square distribution, the Hausman test assesses the appropriateness of each model. The study employs specific criteria for model selection, with H0 suggesting the Random Effect Model is suitable, indicated by a p-value greater than 0.05. Conversely, H1 posits that



the Fixed Effect Model is more appropriate, evident when the p-value is less than 0.05. The Hausman test, thus, contributes to the determination of the optimal model, enhancing the precision and reliability of the panel data regression analysis in this study.

Table 3. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.171264	4	0.0376

Source: Data has been processed by the author (2023)

It can be seen in Table 3 that the probability value of 0.0376 is lower than the threshold of 0.05. Therefore, a decision is made to reject the null hypothesis (H0) which is based on the conclusion that the fixed effect model is more suitable than the random effect model.

Lagrange Multiplier Test

The Lagrange multiplier test, employing the Breusch Pagan technique, is employed in this study to identify a model superior to both the random effect model and the common effect model. Through this testing method, the study aims to determine the most suitable model, with specific criteria guiding the decision-making process. The null hypothesis (H0) posits that the Common Effect model is appropriate, evident when the p-value exceeds 0.05. Conversely, the alternative hypothesis (H1) suggests that the Random Effect Model is more suitable, as indicated by a p-value less than 0.05. The application of the Lagrange multiplier test using the Breusch Pagan technique contributes to the refinement of the model selection process, enhancing the accuracy and reliability of the study's analytical framework.

Table 4. Lagrange Multiplier Test

Cross-section	Test Hypothesis		
		Time	Both
Breusch-Pagan	25.19950	1.772751	26.97225
	(0.0000)	(0.1830)	(0.0000)

Source: Data has been processed by the author (2023)

Table 4 shows that the probability value of 0.000 is less than 0.05. Therefore, the choice to reject the null hypothesis (H0) is taken with the conclusion that the random effect model is more appropriate than the common effect model. After comparing the three model selection criteria, two model test results suggest that the fixed effect is more suitable for this study.

Panel Data Regression Model

According to Pandoyo & Sofyan (2018), Panel data regression analysis is a combination of sequence and cross-section data by incorporating relevant variables in both sequence and cross-section into the information model. Panel data can significantly reduce the problems associated with ignored variables. After the model selection was made, the researcher performed panel data regression using the fixed effect model. This was done based on the model test that had been carried out previously. The findings of this research panel data regression can be seen as follows.



Table 5. Panel Data Regression Model

Variable	Coefficient	Std. Error
C	-7.83E+11	1.34E+11
ATTRIBUTE_BOARD_DIRECTION	2.72E+10	4.02E+09
MACROPRUDENTIAL_POLICY	5.98E+09	9.69E+09
INFLATION	-1.22E+12	9.85E+11
FIRM_SIZE	3.96E+10	9.00E+09

Source: Data has been processed by the author (2023)

The panel data regression equation from the data management results in Table 5 can be described as follows:

$$\text{Bank Risk-Taking Behavior} = -7.83 + 2.72 + 5.98 \text{ Macroprudential Policy} - 1.22 \text{ Inflation} - 3.96 \text{ Firm Size}$$

Based on the panel data regression model above, it shows that an increase in one unit of the board of directors attributes can increase bank risk-taking behavior by 2.72, an increase in one unit of macroprudential policy can increase bank risk-taking behavior by 5.98, an increase in one unit of inflation can reduce bank risk-taking behavior by 1.22 and an increase in one unit of firm size can reduce bank risk-taking behavior by 3.96.

Moderated Regression Model

Regression functions as a moderating factor because it can affect the extent to which the relationship between the independent variable and the dependent variable is relatively strong or weak (Tse et al., 2019). Moderated regression analysis is the term used to describe the concept of macroprudential policy as a moderating variable in this study. The moderated regression analysis is represented by the equation that can be found below.

Table 6. Moderated Regression Model

Variable	Coefficient	Std. Error
C	-7.84E+11	1.34E+11
ATTRIBUTE_BOARD_DIRECTION	2.81E+10	4.24E+09
MACROPRUDENTIAL_POLICY	-1.26E+10	2.75E+10
INFLATION	-1.23E+12	9.87E+11
FIRM_SIZE	3.91E+10	9.05E+09
IINTERACTION	1.70E+09	2.36E+09

Source: Data has been processed by the author (2023)

The moderation regression equation from the results of data management in Table 6 can be described as follows:

$$\text{Bank Risk-Taking Behavior} = -7.84 + 2.81 + 5.98 \text{ Macroprudential Policy} - 1.26 \text{ Inflation} + 3.91 \text{ Firm Size} + 1.70 \text{ Interaction}$$

Based on the moderation regression model above, it shows that an increase of one unit of board of directors attributes can increase bank risk-taking behavior by 2.81, an increase of one unit of macroprudential policy can increase bank risk-taking behavior by 1.26, an increase of one unit of inflation can reduce bank risk-taking behavior by 1.23, an increase of one unit of company size can increase bank risk-taking behavior by 3.91, and an increase of one unit of interaction can increase bank risk-taking behavior.



Classical Assumption Test

To assess the effectiveness of the regression model used in this study, the classical assumption testing method is used Pandoyo & Sofyan (2018). Based on the findings of this study, the following are the results of the classical assumption test.

Normality Test

Jarque-Berra, chi-square, and probability (p-value) values can be used to test for normality in this study. The requirements needed to fulfill normally distributed data are Jarque-Berra < Chi-Square or p-value > 0.05. The following figure summarizes the normality test in this study.

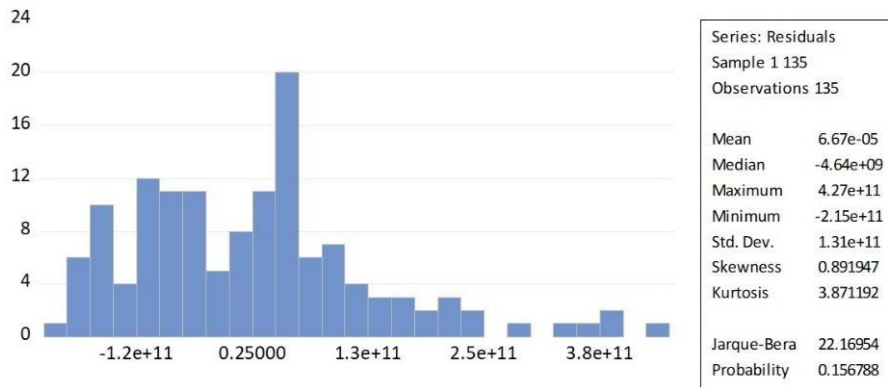


Figure 6. Normality Test

Source: Data has been processed by the author (2023)

As seen in Figure 6, the probability value of 0.156788 is greater than the significance threshold α set at 0.05. Therefore, the data is considered as normally distributed data.

Autocorrelation Test

The Durbin Watson (DW) value can be used to test for autocorrelation in this study. The presence of autocorrelation in the model causes the estimator to be inefficient and the T and F tests, which are usually used, to be invalid. The necessary condition to meet the absence of autocorrelation is a DW number between -2 and 2. The following table summarizes the autocorrelation test in this study.

Table 7. Autocorrelation Test

Model Summary					
R-squared	Adjusted R-squared	S.E. of regression	F-statistic	Prob (F-statistic)	Durbin-Watson stat
0.200836	0.163375	1.13E+11	5.361233	0.000057	1.982834

Source: Data has been processed by the author (2023)

Table 7 shows a DW value of 1.982834, which means that the DW value is between - 2 and 2. This means that the residual data does not show autocorrelation.

Multicollinearity Test

To evaluate the presence of multicollinearity in a regression model, it is necessary to check the tolerance value and Variance Inflation Factor (VIF) with the condition that the tolerance value exceeds 10% and the VIF value is less than 10 to determine the absence of multicollinearity in the regression model. The following table summarizes the multicollinearity test in this study.



Table 8. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.86E+22	157.9798	NA
ATTRIBUTE_BOARD_DIRECTION	1.38E+19	17.01545	2.000986
MACROPRUDENTIAL_POLICY	1.41E+20	1.417598	1.211784
INFLATION	1.37E+24	10.24308	1.205675
FIRM_SIZE	8.82E+19	220.7169	2.014121

Source: Data has been processed by the author (2023)

It can be concluded that there is no multicollinearity in the independent variables based on the findings of the multicollinearity test which can be seen in Table 7. The VIF value of each variable is not more than 10 which indicates that there is no multicollinearity.

Heteroscedasticity Test

To determine the difference in residual variables between observations in the regression model, it is necessary to test for heteroscedasticity. The requirement needed to fulfill the absence of heteroscedasticity is that the probability value of F is greater than the significant level of alpha 0.05. The following table summarizes the heteroscedasticity test in this study.

Table 9. Heteroscedasticity Test

Model Summary			
F-statistic	Obs*R-squared	Prob. F(4,130)	Prob. Chi-Square(4)
3.727447	13.89017	0.0662	0.0765

Source: Data has been processed by the author (2023)

It can be concluded that the residual data does not show heteroscedasticity based on the probability value (prob) of each independent variable more than 0.05 which can be seen in Table 9.

Partial Hypothesis Testing (T-Test)

A partial test serves to determine the magnitude of the independent variable on changes in the dependent variable. The requirement for a partial influence between the dependent variable and the independent variable is the $t_{count} > t_{table}$ value or the significance value ≤ 0.05 . The following is a table that summarizes the partial test (T-test) in this study.



Table 10. Partial Test (T-Test)

Variable	Coefficient		Std. Error		t-Statistic		Prob.	
	Panel Data	Moderated Regression	Panel Data	Moderated Regression	Panel Data	Moderated Regression	Panel Data	Moderated Regression
C	-	-7.84E+11	1.34E+11	1.34E+11	-	-5.847468	0.000	0.0000
Attributes of the Board of Directors	7.83E+11	2.81E+10	1.34E+11	4.24E+09	5.855181	6.632132	0	0.0000
Macroprudential Policy	2.72E+10	-1.26E+10	4.02E+09	2.75E+10	6.763520	-0.456689	0	0.6489
Inflation	5.98E+09	-1.23E+12	9.69E+09	9.87E+11	0.616491	-1.249577	9	0.2143
Company size	1.22E+12	3.91E+10	9.85E+11	9.05E+09	1.243113	4.320085	6	0.0000
Interaction	3.96E+10	1.70E+09	9.00E+09	2.36E+09	4.402100	0.720558	0	0.4728

Source: Data has been processed by the author (2023)

Table 10 shows the results of the partial test (T-test) which is used to determine the magnitude of the influence of each independent variable on the dependent variable during this study. The description of Table 10 is as follows:

Hypothesis 1:

The probability value on the board of directors attribute variable is 0.000 based on the panel data regression results and 0.000 based on the moderation regression results, both probabilities are smaller than α (0.05), therefore the decision to accept H1 is obtained with the conclusion that there is a significant effect of the board of directors attributes on bank risk-taking behavior. This is in line with research conducted by Mollah et al. (2021) which states that independent non-executive directors (INED) can significantly mitigate bank risk-taking behavior.

Hypothesis 2:

The probability value on the macroprudential policy variable is 0.5389 based on the panel data regression results and 0.6489 based on the moderation regression results, both probabilities are greater than α (0.05), hence the decision to reject H2 with the conclusion that there is no significant effect of macroprudential policy on bank risk-taking behavior. According to Altunbas et al. (2018), the application of macroprudential policies to each bank has a different response, depending on the specific characteristics of each bank's balance sheet. In addition, it is concluded that macroprudential policy is more effective during the policy tightening implementation cycle than the policy easing cycle. Meanwhile, in Indonesia, according to Bank Indonesia's annual report 2018-2022, the average implementation of macroprudential policy instruments has been eased.

Hypothesis 3:

The probability value on the interaction (moderation) of the board of directors attribute variable with the macroprudential policy of 0.4728 is greater than α (0.05), therefore the decision to reject H5 is obtained with the conclusion that there is no macroprudential policy that cannot moderate the effectiveness of the board of directors on bank risk-taking behavior. These results explain that increasing interaction (moderation) is not able to increase the effectiveness of the board of directors in shaping



bank risk-taking behavior. According to research conducted by Zainuri & Arthasari (2021) to see the effect of macroprudential policy in moderating the effectiveness of the board of directors on bank risk-taking behavior, there needs to be an effective interaction between macroprudential policy and monetary policy. Thus, to achieve the effectiveness of macroprudential policies in moderating the effectiveness of the board in shaping bank risk-taking behavior, the role of monetary policy is necessary.

Hypothesis 4:

The probability value on the inflation variable is 0.2166 based on the pane data regression results and 0.2143 based on the moderation regression results, both probabilities are greater than α (0.05), therefore the decision to reject H3 is obtained with the conclusion that there is no significant effect of inflation on bank risk-taking behavior. These results explain that increasing inflation is not able to increase the influence of bank risk-taking behavior. This result is not in line with the research of Basty et al. (2023) but in line with research by Hutabarat (2017) that inflation has no significant effect on bank risk-taking behavior because each bank has unique microeconomic characteristics, one of which is risk management policy, this policy can play a role in determining the extent to which inflation affects bank risk-taking behavior.

Hypothesis 5:

The probability value on the firm size variable is 0.000 based on the pane data regression results and 0.000 based on the moderation regression results, both probabilities are smaller than α (0.05), therefore the decision to accept H4 is obtained with the conclusion that there is a significant effect of firm size on bank risk-taking behavior. These results are in line with the research of Basty et al. (2023).

Simultaneous Test (F-Test)

To determine how significant the simultaneous regression model is by assessing the probability (F-statistic). The probability value, also known as the F-statistic, must be lower than 0.05 so that there is a large influence between the independent variable and the dependent variable. The summary table of the simultaneous test (F test) conducted in this study can be seen below.

Table 11. Simultaneous Test (F-Test)

Model Summary		
R-squared	Adjusted R-squared	Prob(F-statistic)
0.863472	0.822381	0.000000

Source: Data has been processed by the author (2023)

Table 11 shows that the F-statistic probability value of 0.000 is lower than the significance level α (0.05). Therefore, the decision to accept Hypothesis 6 is taken with the conclusion that there is a significant simultaneous effect between board attributes, macroprudential policy, inflation, and firm size, as well as the interaction of board attributes with macroprudential policy on bank risk-taking behavior.

Test Coefficient of Determination

The R^2 value indicates the extent to which the model can account for fluctuations in the independent variables of the model. The R^2 value indicates that the independent variables have provided almost all the information needed to make accurate predictions about fluctuations in the dependent variable. The coefficient of determination test also called the R^2 test conducted in this study is summarized in the following table.



Table 12. Test Coefficient of Determination

Model Summary		
R-squared	Adjusted R-squared	Prob(F-statistic)
0.863472	0.822381	0.000000

Source: Data has been processed by the author (2023)

Table 12 regarding the coefficient of determination above shows the R-squared value of 0.863 and Adjusted R-squared of 0.822 which means that the variables of board attributes, macroprudential policies, inflation, company size, and the interaction of board attributes with macroprudential policies can influence bank risk-taking behavior by 82.2% while the remaining 17.8% (100% - 82.2%) is influenced by other factors outside this study.

CONCLUSION

Macroeconomic volatility may affect financial system stability. The government uses banks, which offer financial services and guarantee financial system stability, to handle this problem. One may gauge macroeconomic conditions by looking at GDP and inflation. Indonesia's macroeconomic condition became more unstable in 2020 because of the COVID-19 epidemic, which reduced GDP-inflation interaction. Macroprudential rules and the board of directors' policy implementation may solve this problem. The board of directors' leadership and this approach will boost GDP and inflation in 2021 and 2022. This study discusses the effect of macroprudential policies, board effectiveness, macroprudential policies that moderate board effectiveness, firm size, and inflation on bank risk-taking behavior. Partial test results from this study indicate that only the effectiveness of the board of directors and company size have a significant effect on risk-taking behavior. While macroprudential policy, a macroprudential policy that moderates the effectiveness of the board of directors, and inflation are considered to not affect bank risk-taking behavior, this is due to differences in bank-specific characteristics, the effectiveness of corporate governance, policy implementation in the form of policy easing and tightening, and the interaction between macroprudential policy and monetary policy. However, macroprudential policies, board effectiveness, and macroprudential policies that moderate board effectiveness, firm size, and inflation together have a significant influence on bank risk-taking behavior. Further researchers can provide more detailed specifications data for the samples taken, especially the specific characteristics of banks, corporate governance, and implementation of macroprudential policies.

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