

## Research Article

# The Influence of Executive and Independent Roles of Women Board Members on Bank Risk: Evidence from Indonesia

Wahidatun Nailis Sa'adah, Linda Putri Nadia\*, Dwi Soegiarto

Economics and Business Faculty, Universitas Muria Kudus, Indonesia

**ORCID**

Linda Putri Nadia: <https://orcid.org/0000-0002-9109-932X>

**Abstract.**

This study examines the impact of the presence of women executives on bank risk, with a focus on banks in Indonesia. The research sample consists of 44 banks registered in Indonesia between 2013 and 2022. The analytical method employed is a fixed effect, incorporating year and bank effects. The research findings reveal that the presence of women executives and independent directors significantly reduces bank risk, as measured by indicators such as Non-Performing Loans (NPL) and Z-Score. The implications of these findings provide new insights into the contributions of women executives and independent directors to the stability and performance of banks in Indonesia. This study contributes to a deeper understanding of factors that can reduce bank risk and offers valuable perspectives for practitioners, policymakers, and researchers.

Corresponding Author: Linda Putri Nadia; email: [linda.putri@umk.ac.id](mailto:linda.putri@umk.ac.id)

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**Keywords:** women board member, bank risk, Indonesia

## 1. Introduction

Studies on bank risk-taking generally focus on regulations, bank size, global financial crises, and bank loans, leaving a gap in the literature regarding how gender diversity, especially among women executives, influences bank risk-taking (Abdul Hamid et al., 2020; Badarau & Lapteacru, 2020; Corona et al., 2019; Dahir et al., 2018; Siddika & Haron, 2020a; Uddin et al., 2020). Independent and gender-diverse executive boards play a role in reducing the level of risk-taking by banking institutions, which, in turn, can support financial stability (Di Tommaso & Thornton, 2020). Paying attention to board diversity is crucial to enhancing understanding of overall bank performance. Banks with women's representation tend to face lower risks than non-gender-diverse boards (Setiyono & Tarazi, 2018).

Berger et al. (2014), Marius Andrieş et al. (2017), Palvia et al. (2014), and Yu et al. (2017) state that banks led by women executives tend to practice more cautious risk

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management by maintaining higher levels of equity capital, regardless of control over bank asset risks and other attributes. Additionally, companies with lower risk exposure are more likely to add women executives to their boards of directors. Banks with a higher proportion of women among board members tend to show higher profitability, particularly in countries with more relaxed regulations. This result contrasts with the research conducted by Zigraiova (2016), stating that a higher number of women directors worsens risk.

Most related research has been conducted in European countries such as Germany, with only a few studies in Asian countries. Given that Asian countries are worth exploring further, we analyze the impact of women executives and women independent on board on risk-taking in the banking sector in Indonesia. Moreover, the majority of previous research on bank risk-taking has only focused on bank performance and corporate governance in the banking sector (Adegboye et al., 2020; Siddika & Haron, 2020b), with limited research on the influence of women executives and women independents on bank risk-taking. Our objective is to determine whether the presence of women on executive and independent boards in Indonesia affects bank risk-taking (Galletta et al., 2022).

We found that the presence of women executives and women independent boards might give negative effects on bank risk-taking. These findings support the hypothesis that increasing the proportion of women on the board enhances bank performance. A higher proportion of women reflects a more meritocratic-based selection process for board members. The concept of meritocracy emphasizes that individuals with the best qualifications and performance should be given higher responsibilities, titles, or positions (Owen & Temesvary, 2018). A higher proportion of women reflects a more meritocratic-based selection process for board members, and the presence of many independent directors provides effective control and improves loan quality (Tarchouna et al., 2022). Banks tend to reduce risk when the board has more members, high independence levels, and lower stock ownership (Hunjra et al., 2020).

This study contributes to the literature in two ways. First, it explores the relatively under-researched in Asian countries because studies related to the influence of Executive Women and Independent Women on bank risk-taking are still limited compared to other countries. Second, it fills a crucial gap in the literature on the influence of Executive Women and Independent Women on bank risk-taking in Indonesia, a country in the Asian continent with characteristics different from European countries.

This article proceeds as follows. Section 2 presents a method. Section 3 presents the result and discussion. Finally, we conclude in Section 4.

In summary, this introduction provides a comprehensive overview of the research context, literature review, research objectives, and the rationale for the study. The following section details the methodology employed to investigate the impact of women executives and independent directors on bank risk-taking in Indonesia.

## 2. Method

We employ a panel data method to evaluate the performance of banks listed on the Indonesia Stock Exchange (IDX) from 2013 to 2022. The sample selection process was conducted meticulously, ensuring the inclusion of banks listed on the IDX during the study period providing a comprehensive overview of the evolution of the banking industry over the investigated period.

Data on executive women and women independent directors were compiled from information provided in annual reports. For each bank and fiscal year, we determined the gender of executives and board chairs manually based on their names. In cases where names were unisex, we assigned the gender that constituted at least 80 percent of the name holders to determine the gender of the board of directors. For ambiguous names, we conducted internet searches to ascertain their gender.

To assess the influence of executive women and independent women on bank risk-taking, we constructed the following empirical model:

$$\begin{aligned} \text{NPL}_{i,t} &= \alpha + \beta_1 \text{Executive Women} + \beta_2 \text{Independent Women} + \sum \beta_i \text{Controls}_{i,t} + \epsilon_{i,t} \\ \text{Z Score}_{i,t} &= \alpha + \beta_1 \text{Executive Women} + \beta_2 \text{Independent Women} + \sum \beta_i \text{Controls}_{i,t} + \epsilon_{i,t} \end{aligned}$$

This study employs a fixed-effects model by including year and bank effects to control for variations across years and differences among banks in the data analysis. The independent variables in this study are Executive Women and Independent Women, while the dependent variables are NPL (Non-Performing Loans) and Z-Score. Non-Performing Loans (NPL) (Abbas et al., 2021; Lafuente et al., 2019) and Z-Score (Angkinand & Wihlborg, 2010) are commonly used indicators of bank risk, reflecting the quality of the bank's assets and the bank's financial sustainability, respectively.

## 3. Result and Discussion

### 3.1. Result

*Note.* NPL, which stands for non-performing loans to total assets ratio, reflects the level of troubled loans in the bank's portfolio. TCAPR, or total bank equity to total assets,

TABLE 1:

Table 1	Summary Statistic				
Variable	Observation	Mean	SD	Minimum	Maximum
NPL	385	.0271948	.2121748	-0,03	4.17
TCAPR	382	.1801832	.1187853	.01	.89
TITA	302	.297947	.378743	.07	3.9
DPR	135	.3101482	.191946	0	1.45
ROA	389	2. 675817	.607794	0	3. 367296
SIZE	389	31. 71445	2. 992549	25.34	42.07
LNZSCORE	261	3. 641264	1. 408997	-1.07	7.45
INDEPENDENT BOARD	413	.2483535	.0971297	0	.67
WOMEN INDEPENDENT	413	.0400242	.0605497	0	.33
EXECUTIVE WOMEN	413	.0187167	.0700904	0	.6
BOARD SIZE	413	2. 329119	.4427729	.6931472	3. 433987

Source. (Authors calculations using 'Stata's' Output)

indicates the bank's level of capitalization. TITA, or tier 1 capital to total assets, provides an overview of the bank's core capital relative to total assets. DPR, the dividend payout ratio, measures how much the company distributes profits to shareholders as dividends. ROA, an abbreviation for return on assets, indicates the efficiency of asset utilization by the bank. SIZE reflects the bank's relative size in terms of total assets. LNZSCORE refers to the logarithmic value of the Z score to assess the bank's risk-taking. INDEPENDENT BOARD refers to the presence of an independent board of directors in the company's structure. WOMEN INDEPENDENT indicates the proportion of independent women on the board of directors. EXECUTIVE WOMEN reflects the proportion of women in executive positions within the management structure. BOARD SIZE indicates the total number of board members in a bank.

The non-performing loan (NPL) levels among the banks in the sample exhibit significant variation, with an average of 0.0271948 and a standard deviation of approximately 0.2121748. The range of NPL values, spanning from -0.03 to 4.17, provides an overview of the extent to which the non-performing loan levels can vary among these financial institutions.

In the correlation analysis presented in Table 2, the coefficients indicate the strength and direction of the relationship between variables. It's important to note that correlation

TABLE 2:

Table 2	Fixed Effect											
Variable	1	2	3	4	5	6	7	8	9	10	11	12
NPL	1.000											
TCAPR	0.0459	1.000										
TITA	0.0354	0.8124	1.000									
DPR	0.1305	0.4123	0.2554	1.000								
ROA	0.0217	0.0428	0.0452	0.2471	1.000							
SIZE	0.0714	-0.25	0.2230	0.2412	0.1919	1.000						
LNZSCORE	0.0536	-0.014	0.1171	-0.099	0.4271	0.0669	1.000					
IND. BOARD	0.0499	0.0597	0.1055	0.0659	0.0682	0.0558	0.0061	1.000				
WOMEN IND	0.0444	0.2515	0.2771	0.3193	0.0026	0.0102	0.0034	0.2694	1.000			
EXE. WOMEN	0.0117	-0.042	0.0043	-0.126	0.0476	-0.06	0.0177	0.0100	0.0344	1.000		
BOARD SIZE	0.0749	-0.286	0.2780	0.1665	0.2514	0.5463	0.1567	0.2026	0.1673	-0.004	1.000	

coefficients range from -1 to 1, where a coefficient closer to 1 or -1 indicates a stronger linear relationship, while a coefficient closer to 0 indicates a weaker relationship.

In our analysis:

A positive correlation coefficient suggests a positive relationship between variables, meaning that as one variable increases, the other tends to increase as well. Conversely, a negative correlation coefficient indicates an inverse relationship, where one variable tends to decrease as the other increases.

The magnitude of the correlation coefficient also provides insight into the strength of the relationship. Generally, coefficients closer to 1 or -1 indicate a stronger relationship, while coefficients closer to 0 suggest a weaker relationship.

However, it's essential to consider practical significance alongside statistical significance. Even if a correlation is statistically significant, its practical implications may vary depending on the context of the study and the variables involved.

For instance, in our analysis:

The positive correlation coefficient of 0.0499 between Non-Performing Loans to Total Assets (NPL) and Independent Board suggests a weak positive relationship. This implies that banks with higher NPL levels tend to have a slightly more independent board of directors. This phenomenon can be explained by the bank's efforts to enhance corporate governance and reduce potential conflicts of interest that may arise in dealing with non-performing loan issues. An independent board of directors can bring additional

perspectives and oversight, assisting banks in managing risks more effectively (Barakat & Hussainey, 2013; Tarchouna et al., 2017).

On the other hand, the negative correlations with variables such as Women Independent, Executive Women, and Board Size suggest that banks with higher NPL levels tend to have fewer women in independent board positions, fewer executive women, and smaller board sizes. Although these correlations are not very strong, they provide insights into potential organizational dynamics related to bank risk-taking.

Overall, while correlation analysis offers valuable insights into the relationships between variables, it's essential to interpret these findings cautiously and consider them within the broader context of the research question and theoretical framework.

For control variables, including Total Bank Equity to Total Assets (TCAPR), Tier 1 Capital to Total Assets (TITA), Return on Assets (ROA), Dividend Payout Ratio (DPR), and Size, the correlation analysis indicates that the Non-Performing Loans to Total Assets (NPL) has a relatively weak relationship with these variables. Specifically, a moderate negative correlation between NPL and TCAPR of -0.0459 indicates that the higher the NPL, the lower the proportion of total bank equity to total assets. The correlation with TITA of -0.0354 shows a lower relationship, indicating that NPL is less associated with the bank's core capital than total assets.

The most significant correlation with DPR shows a strong negative correlation of -0.1305. This indicates that the higher the level of non-performing loans (NPL), the lower the tendency for the company to pay dividends to shareholders. A lower negative correlation with a ROA of -0.0217 suggests a weak connection between the NPL level and the efficiency of asset utilization by the bank. Furthermore, the correlation with Size is -0.0714, indicating that banks with higher NPL tend to have a relatively smaller size.

A correlation coefficient of -0.0536 approaching zero indicates that the relationship between the Non-Performing Loans to Total Assets (NPL) level and the logarithm of the Z score (LNZSCORE) is not strong. The low correlation indicates that changes in the non-performing loan level do not consistently result in significant changes in the bank's risk-taking. The negative correlation suggests that as the NPL level increases, LN ZSCORE tends to decrease, reflecting a decline in the bank's risk-taking in the context of using a natural logarithmic Z score.

In our analysis, we employed a multiple regression model to examine the relationship between bank risk-taking, measured by Non-Performing Loans to Total Assets (NPL) and Z Score, and various independent variables. The dependent variables, NPL and Z Score, represent different aspects of bank risk, with NPL reflecting the level of troubled loans in the bank's portfolio and Z Score indicating the bank's financial sustainability. The

TABLE 3:

Table 3	Bank Risk-Taking and NPL		
Variables	1	2	3
	NPL	NPL	NPL
WOMEN INDEPENDENT	-0.558*	-0.730**	-0.721*
	(-1.94)	(-1.98)	(-1.93)
EXECUTIVE WOMEN	-0.830***	-0.999***	-1.026***
	(-3.66)	(3.41)	(-3.45)
BOARD SIZE	-0.0568	-0.0508	-0.0478
	(-0.73)	(-0.48)	(-0.45)
INDEPENDENT BOARD	0.211	0.203	0.132
	1.04	(0.74)	(0.48)
TCAPR		-0.149	-0.0886
		(-0.58)	(-0.34)
TITA		-0.0218	-0.0336
		(-0.30)	(-0.46)
ROA		0.00312	-0.00650
		(0.10)	(-0.20)
SIZE		-0.0129	-0.0166
		(-0.44)	(-0.51)
_cons	0.121	0.582	0.632
	(0.65)	(0.66)	(0.64)
Bank Effect	NO	NO	YES
Year Effect	NO	NO	YES
Obs.	379	298	298
R2	0.0823	0.0802	0.126

independent variables included in the regression model encompassed factors such as the presence of women executives and independent directors on the board, total bank equity to total assets, tier 1 capital to total assets, return on assets, dividend payout ratio, bank size, and board size. By analyzing these variables within a regression framework, we aimed to identify significant predictors of bank risk-taking and gain insights into the factors influencing bank performance and stability.

The regression results indicate that the presence of Women Independent has a negative relationship with the level of Non-Performing Loans to Total Assets (NPL) in all columns. However, the coefficient is not statistically significant in Column 1. The increased significance in Column 2 and Column 3 suggests that women’s independent

significantly influences the reduction of NPL, indicating their positive role in mitigating bank credit risk.

On the other hand, Executive Women have a stronger and more significant impact on reducing the level of NPL. The negative and significant coefficient in Column 1 continues to increase and reaches significance in Column 3, indicating that the presence of Executive Women consistently influences the reduction of bank credit risk.

Board Size, although showing a negative relationship with NPL, is not statistically significant, indicating that the size of the board does not significantly impact the level of NPL.

Independent Board, although showing a positive relationship with NPL, is also not statistically significant, indicating that the presence of an independent board of directors does not significantly affect the level of bank credit risk.

Notes. This table presents the regression results with the dependent variable *Ln Zscore* and independent variables *Women Independent*, *Executive Women*, *Board Size*, *Independent Board*, *TCAPR*, *TITA*, *ROA*, *SIZE*, and *\_cons* (intercept). Each independent variable has a coefficient indicating the extent of its influence on the dependent variable. The asterisk (\*) signifies the level of statistical significance, with \* indicating significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level. The numbers in parentheses represent the t-statistic values that measure the significance of the coefficients.

This regression analysis shows that the regression coefficients reflect the direction and strength of the relationship between the independent and dependent variables. If the coefficient is positive, as in the case of *Women Independent* in column 1, it indicates a positive relationship with *Ln Zscore*. Conversely, when the coefficient is negative and significant, as in the case of *Executive Women* in columns 2 and 3, it indicates that the variable has a strong negative relationship with *Ln Zscore*. In this case, *Executive Women* have a significant negative impact on the bank's risk-taking, measured by *Ln Zscore*. This means that the higher the proportion of women executives, the lower the bank risk-taking.

The positive coefficient on *Board Size* in column 1 indicates a significant positive relationship with *Ln Zscore*. This means that the larger the board size, the better the risk-taking of the bank, although, in columns 2 and 3, this coefficient becomes insignificant, indicating variability in the influence of board size.



TABLE 4:

Table 3 Variables	Bank Risk-Taking and Z Score		
	1		3
	In Zscore	In Zscore	In Zscore
WOMEN INDEPENDENT	1.730 (0.91)	1.328 (0.62)	1.328 (0.62)
EXECUTIVE WOMEN	-1.148 (-0.96)	-2.809* (-1.67)	-2.809* (-1.67)
BOARD SIZE	0.783* (1.77)	-0.320 (-0.56)	-0.320 (-0.56)
INDEPENDENT BOARD	-0.603 (-0.58)	-2.734* (-1.91)	-2.743* (-1.91)
TCAPR		2.159 (1.16)	2.159 (1.16)
TITA		-0.119 (-0.20)	-0.119 (-0.20)
ROA		0.702*** (3.43)	0.702*** (3.43)
SIZE		0.215 (1.30)	0.215 (1.30)
_cons	1.934* (1.94)	-4.059 (-0.82)	-4.059 (-0.82)
Bank Effect	NO	NO	YES
Year Effect	NO	NO	YES
Obs.	249	181	181
R2	0.0197	0.170	0.170

### 3.2. Discussion

Although banking risk has been a widely debated topic in the literature, currently, we argue that there is no empirical study specifically focusing on the relationship between women executives and women independent directors with bank risk-taking. In this paper, we analyze the impact of women executives and women independent directors on bank risk-taking using a sample of banks in Indonesia. Our initial findings indicate that the presence of women executives is negatively related to bank risk-taking. This suggests that the higher the number of women executives on the board, the lower the level of risk taken by the bank. These results support our first hypothesis, stating

that women executives have a negative impact on bank risk-taking (Issa & Fang, 2019; Saunders et al., 1990; Cornwall, 2003; Francis et al., 2013; Post & Byron, 2013; Theodos et al., 2014).

Furthermore, we examine the variable of women independent directors on bank risk-taking. The findings indicate that the higher the number of women independent directors on the board, the lower the bank's risk-taking (Vacca et al., 2019; Ellul & Yerramilli, 2013; Sobhy et al., 2017; Buchwald & Hottenrott, 2015; Mustafa et al., 2020; Reichel et al., 2020; Saeed et al., 2021). This aligns with our second hypothesis, which states that women independent directors have a negative impact on bank risk-taking. In the framework of agency theory, this study attempts to analyze how the presence of independent women directors on the board of directors can influence agency dynamics in banking companies, particularly regarding risk-taking. Agency theory emphasizes the concept that managers, as agents of the company, may tend to take higher risks or even act dishonestly because they are not direct owners and have little personal interest in the company.

In this context, the presence of independent women directors can be considered as variables that can influence agency behavior. Their presence on the board of directors can provide additional perspectives and control over management decisions, which can impact the level of risk taken by the bank. Independent directors, with their identity as a third party not directly involved in day-to-day management, are expected to bring objectivity and a focus on the company's interests, reducing the potential for detrimental agency behavior.

Thus, the findings indicating that independent women are negatively related to bank risk-taking can be interpreted as the result of a better agency role. Their presence on the board of directors may help reduce detrimental agency behavior, resulting in more balanced and long-term oriented management decisions, ultimately reducing the level of risk taken by the bank.

## 4. Conclusion

In this study, we examined the influence of women executives and women independent directors on bank risk-taking within the context of Indonesian banking institutions. Utilizing a sample of 44 banks listed in Indonesia from 2013 to 2022, we employed a fixed-effect model to analyze the data, considering both year and bank effects. Our findings reveal a significant reduction in bank risk associated with the presence of

women executives and independent directors, as indicated by metrics such as Non-Performing Loans (NPL) and Z-Score.

Our study contributes to the literature by addressing a gap in research on the impact of gender diversity on bank risk-taking, particularly in Asian countries like Indonesia. By highlighting the negative effect of women executives and independent directors on bank risk-taking, our findings underscore the relevance of agency theory in understanding corporate governance dynamics within the banking sector. Women directors, especially independent ones, bring objectivity and a focus on the company's interests, mitigating harmful agency behaviors and promoting more conservative risk management strategies.

Furthermore, our research emphasizes the importance of considering gender diversity in corporate boards when formulating risk management strategies. The implications of our findings extend to regulators, practitioners, and stakeholders involved in shaping policies and practices within the Indonesian banking sector.

However, it's essential to acknowledge the limitations of our study, including the constraints associated with the sample size and the research period. Future research endeavors should encompass a broader range of bank companies from various countries to enhance the generalizability of results. Additionally, extending the research period and expanding the sample size would provide a more comprehensive understanding of the relationship between women executives, women independent directors, and bank risk-taking.

In conclusion, our study contributes valuable insights into the role of gender diversity in mitigating bank risk-taking, offering avenues for further exploration and development in both academia and practice. By addressing these limitations and building upon our findings, future research can facilitate the development of more effective risk management strategies in the banking sector.

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