An assessment of female executives' influence on bank performance in Indonesia based on critical mass theory

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ABSTRACT

This study examines how female executives affect bank performance in Indonesia's emerging market. It also investigates whether a critical mass of females on the board of management impacts bank performance. The sample was obtained from 29 banks, which covers 64.5% of publicly listed banks in Indonesia, for the observation period of 2010–2019. This study employs balanced panel data regression analysis, including the year fixed effect. Five surrogate indicators were used for female executives: female Chief Executive Officer (CEO), female Chief Financial Officer (CFO), the presence of females on the board of management, the proportion of female members on the board of management, and the number of female members on the board of management. Critical mass is reached if there are three or more female members on the board of management. The findings suggest that female executives do not significantly impact bank performance. The critical mass suggests a similar result. The findings are consistent and robust for the additional analysis using a lagged independent variable. Nevertheless, the results show that female CEOs positively impact return on assets (ROA) and return on equity (ROE). Empirical findings in Indonesia suggest that female executives do not affect bank performance. The absence of this effect is likely due to unique aspects of Indonesian culture and the structural ownership of firms. However, female CEOs were shown to improve ROE. The findings imply that females are more risk-averse decision makers than males and tend to choose lower-risk investments, which can improve ROA and ROE.

Contribution/Originality: This study contributes to the field of study regarding the critical mass of female executive by enriching the empirical findings. While prior studies primarily based their arguments on using the critical mass of female executives on the board of management, this study shows that female CEOs can significantly improve bank performance.

1. INTRODUCTION

This study explores whether the presence of female executives on a board of management improves a company's performance and, if so, whether there is a critical mass effect. A series of studies on gender diversity has given rise to

relevant academic debates about the presence of females on boards and their effects on company performance. Several empirical studies on this matter have shown positive relationships (Ahmadi, Nakaa, & Bouri, 2018; Assenga, Aly, & Hussainey, 2018; Cardillo, Onali, & Torluccio, 2021; García-Meca, García-Sánchez, & Martínez-Ferrero, 2015), negative relationships (Darmadi, 2011; Johan & Hapsari, 2020), insignificant relationships (Fernández-Temprano & Tejerina-Gaite, 2020; Martinez-Jimenez, Hernández-Ortiz, & Fernández, 2020; Wang, 2020), and even a non-linear relationship (Owen & Temesvary, 2018). This non-linear relationship is related to the critical mass theory (Konrad & Kramer, 2006), according to which females' participation benefits company performance if a certain threshold of gender diversity is reached. Birindelli, Chiappini, and Savioli (2020) stated that possible explanations for these varying results are the presence of context factors (Skała & Weill, 2018) and differences in the characteristics of different companies (Groening, 2019).

Kanter (1977) identified two groups of numerical proportions in organizations, namely the dominant sub-group and the minority. Females may bring unique resources, qualities, and managerial practices to boards of management dominated by males (De Masi, Słomka-Gołębiowska, & Paci, 2021). However, females, as a minority, face difficulties in contributing to firm performance due to tokenism, as they are often seen as representatives of women rather than as individuals and, thus, have to work very hard to get their opinions heard (Konrad, Kramer, & Erkut, 2008). Based on critical mass theory (Kanter, 1977), female behavior in organizations changes according to their numerical representation. When the size of a minority group increases to a certain threshold above which they are no longer considered tokens, the relationship between the minority and majority groups changes substantially as the minority group feels more comfortable and unrestricted (Atif, Liu, & Huang, 2019).

In this study, we investigate how female executives affect bank performance in Indonesia's emerging market using three measures of performance: return on assets (ROA), return on equity (ROE), and net interest margin (NIM). Indonesia provides a unique sample of firms to evaluate when investigating the role of female executives on bank performance. This is because of the low percentage of female board members in Indonesia (Dsouli, Khan, & Kakabadse, 2013) and their low propensity to gain equal opportunities compared to males due to Indonesian culture (Arioglu, 2020; Suherman, 2021). We investigate the role of female executives on firm performance, especially in highly regulated firms (banks) in this context. This paper also examines whether the critical mass of female executives affects bank performance. This paper focuses on all forms of females' existence on boards of management, including female CEOs, female CFOs, the presence of female executives on the board of management, the proportion of female members on the board of management, and the number of female members on the board of management.

Using balanced panel data from 29 publicly listed banks on the Indonesian Stock Exchange (IDX) from 2010–2019, we report that female executives generally do not influence bank performance. Our assessment of the critical mass of female executives on a board of management yielded a similar result. The empirical results from previous studies suggest that tokenism is not the only issue preventing female executives from affecting bank performance. Claessens, Djankov, and Lang (2000) stated that most companies in Indonesia are family companies, meaning that they are controlled by a single family. Therefore, the presence of females on management boards seems to be concerned more with their family relationships with company owners than with their professional experience (Darmadi, 2011). Thus, the women on management boards are not necessarily the best candidates, and so their presence does not affect the bank's performance. We performed a robustness check by conducting dynamic panel data regression with a lagged independent variable. The output of the additional model confirmed the primary result. In addition, only female CEOs were found to have a significant positive influence on ROA and ROE.

Our study makes two important contributions to the existing literature. First, this study contributes to the literature on the critical mass of female executives by enriching the empirical findings on related topics in a highly regulated industry in an emerging market. Second, while prior studies primarily based their arguments on the critical mass of female executives on boards of management, this study shows that female CEOs can significantly improve bank performance.

The remainder of this paper is organized as follows: Section 2 reviews the relevant literature and presents the research hypotheses; Section 3 describes the data, sample, variables, and empirical approach used in this study; Section 4 discusses the empirical results and robustness checks; and Section 5 summarizes and concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Female Executives and Bank Performance

Gender diversity is one of the most often tested aspects of board diversity. Birindelli et al. (2020) stated that males and females exhibit different risk-taking behaviors, both in terms of their personal affairs and managerial decision making. Female executives are more risk-averse and less confident than men when making strategic choices (Dowling & Aribi, 2013; Faccio, Marchica, & Mura, 2016; Huang & Kisgen, 2013). Therefore, females are considered more cautious and less aggressive than men when making decisions (Byrnes & Miller, 1999).

However, from the perspective of agency theory (Fama, 1980; Jensen & Meckling, 1976), the attitudes of females, who tend to be more careful when taking risks, drives them to carry out more strict supervisory functions (Cardillo et al., 2021; Chen, Leung, & Goergen, 2017).

This can support the effectiveness of a board of management and the implementation of corporate governance practices that protect shareholders from managerial decisions that can reduce company performance (Mathew, Ibrahim, & Archbold, 2016). Female directors are also considered more responsible and fair in running the company than male directors (Adams & Ferreira, 2009; Gul, Srinidhi, & Tsui, 2008). Females also tend to establish strong relationships with other stakeholders (Van Der Walt & Ingley, 2003), thus minimizing the potential for agency conflict.

According to resource dependent theory (Hillman, Withers, & Collins, 2009), the presence of females on a board of management can provide new perspectives and valuable advice to upper management (Anderson, Reeb, Upadhyay, & Zhao, 2011). In addition, males and females often have different management styles. Females are considered more communicative and are active participants whose problem-solving and decision-making skills are improved when they work in groups, while males tend to take individual and decisive actions (Dsouli et al., 2013; Peni, 2014). Thus, to face the growing business world, the cooperative leadership style of females is expected to be more productive than the competitive leadership style of males (Eagly & Carli, 2003; Peni, 2014).

The more flexible attitudes of females in establishing good relationships with the environment outside the company (Assenga et al., 2018; Van Der Walt & Ingley, 2003) also makes it easier for females to understand customers' needs and behaviors (Lückerath-Rovers & De Bos, 2011; Shehata, 2013), thus creating valuable opportunities to improve company performance. The positive influence of female board members on company performance has been extensively supported by previous studies (Ahmadi et al., 2018; Assenga et al., 2018; Cardillo et al., 2021; García-Meca et al., 2015; Peni., 2014; Ullah, Fang, & Jebran, 2020).

In contrast, Adams and Ferreira (2009) argued that women can cause excessive oversights for companies that already have good governance, which can weaken communication channels between managers and boards. Such excessive supervision could reduce the value of the company. This negative relationship between the presence of females on the board and company performance is supported by the results reported by Darmadi (2011) and Johan and Hapsari (2020).

Nevertheless, according to agency theory, females tend to avoid risk, meaning that they carry out a more stringent supervisory function than males (Cardillo et al., 2021; Chen et al., 2017) to protect shareholders from managerial decisions that can reduce company performance. Moreover, resource dependence theory claims that the cooperative leadership style of females and their ability to establish good relationships with other stakeholders (Van Der Walt & Ingley, 2003) increases productivity (Eagly & Carli, 2003; Peni., 2014). Thus, we developed Hypothesis 1 as follows:

H1: The presence of female executives has a positive influence on bank performance.

2.2. Critical Mass and Bank Performance

The presence of female executives on a board of management may increase the diversity of opinions and strategic input in the board room, which can influence decisions and the company's leadership style (Ahmadi et al., 2018). However, the presence of women alone is not enough to influence the board's decisions because it could lead to tokenism.

That is, female board members may be seen as representatives of women and not as individuals, making it difficult for female board members to have their opinions heard (Konrad et al., 2008). Due to tokenism and gender stereotypes that portray women as weaker than men and less suitable for top management positions, women are considered to have minimal power in influencing company decisions (Kanter, 1977).

As previously stated in the introduction, when the size of a minority group increases to the point where the members of this group are no longer considered tokens, the relationship between minority and majority groups changes substantially, as these individuals feel more comfortable and unrestricted (Atif et al., 2019). Reaching the critical mass of female board members manifests in a richer set of ideas produced by a board, greater employee motivation, more customers, and an improved corporate image (Carter, Simkins, & Simpson, 2003; Groening, 2019).

In addition, Owen and Temesvary (2018) found a non-linear relationship between the presence of women on a board and company performance. The study argues that women's participation on a board will improve company performance if the gender diversity threshold is reached. Similarly, critical mass theory states that female board members' positive influence can be realized if there are at least three women on the board (Konrad & Kramer, 2006; Konrad et al., 2008).

This theory is supported by an empirical study by Joecks, Pull, and Vetter (2013), who noted that gender diversity initially reduced firm performance but that the effect of gender diversity became positive when the critical mass of the number of women was reached. Thus, Hypothesis 2 of the present study is as follows:

H2: The presence of female executives on a board of management has a positive influence on bank performance if the number of females reaches a critical mass.

3. METHODOLOGY

3.1. Data and Sample

The initial sample included all banks publicly listed on the Indonesian Stock Exchange (IDX). Data from 2010–2019 were extracted from annual reports available on the IDX's official webpage (https://idx.co.id). We used purposive sampling criteria and considered 29 banks with balanced information during the observation period. Thus, our sample covered 64.45% of all public listed banks on the IDX. Table 1 exhibits the sample selection procedure.

Table 1. Sampling selection procedure.

No.	Sample assignment criteria	Total	Percentage
1	Banks listed as of December 31, 2019	45	100.00%
2	(-) Banks with initial public offering after 2010	(16)	(35.55%)
3	(-) Banks delisted/suspended between 2010 and 2019	(0)	(0.00%)
4	(-) Banks with incomplete financial statements	(0)	(0.00%)
5	Banks that match the criteria	29	64.45%

3.2. Variables

3.2.1. Dependent Variable (Bank Performance)

The dependent variable is bank performance (profitability). We used three financial measures of bank performance proxied by return on assets (ROA), return on equity (ROE), and net interest margin (NIM), referring to previous studies (Arafat, Warokka, Buchdadi, & Suherman, 2013; García-Meca et al., 2015; Gupta & Mahakud, 2020; Orazalin & Mahmood, 2019; Saleh & Abu Afifa, 2020). ROA is calculated as the ratio of net income to total assets to

assess how efficiently a bank uses its assets to generate income. ROE is calculated as the ratio of net income to stockholders' equity to determine the rate of return on the resources provided by shareholders. NIM is the ratio of a bank's total net annual interest income to the bank's average earning assets, and it reflects the management quality of a bank. Higher ROA, ROE and NIM values signify better performance.

3.2.2. Main Independent Variable: Female Executives and the Critical Mass of Female Executives

Female executives and the critical mass of female members on a board of management are the main independent variables of this study. We used five surrogate indicators for female executives: female CEO (FEM1), female CFO (FEM2), the presence of females on the board of management (FEM3), the proportion of female members on the board of management (FEM4), and the number of female members on the board of management (FEM5)

We adopted the measures used by Peni (2014); Ullah et al. (2020); Suherman, Usman, Mahfirah, and Vesta (2021) and Ahmad, Prasetyo, Buchdadi, Widyastuti, and Kurniawati (2022) and applied a dummy variable for FEM1, which was assigned a value of 1 if the bank's CEO is female and a value of 0 otherwise. Similarly, we assigned FEM2 a value of 1 for banks with a female CFO and a value of 0 otherwise (Peni & Vähämaa, 2010). Following Atif et al. (2019), we operationalized FEM3 as a dummy variable, assigning a value of 1 if there was at least one female executive on the board of management and a value of 0 otherwise.

FEM4 was measured as the percentage of female executives on a board (Assenga et al., 2018; Atif et al., 2019; Azam, Khalid, & Zia, 2019; Suherman et al., 2021). FEM5 was operationalized as the number of female members on the board of management, following Atif et al. (2019) and Bear, Rahman, and Post (2010). The last independent variable is the critical mass of female executives (denoted as CM in the tables and figure in this paper). This variable was treated as a dummy variable that took a value of 1 if there were at least three female executives on the board of management and a value of 0 otherwise (Atif et al., 2019; Birindelli et al., 2020).

3.2.3. Control Variables

To overcome the endogeneity problem, which can lead to biased estimations, we deliberately used a set of control variables, following prior studies. We scrupulously selected control variables used in previous studies on related topics (Bennouri, Chtioui, Nagati, & Nekhili, 2018; Gupta & Mahakud, 2020; Nyeadi, Kamasa, & Kpinpuo, 2021; Orazalin & Mahmood, 2019; Suherman, Mardiyati, & Rismawati, 2019; Surya, 2021; Tertius & Christiawan, 2015). Thus, the control variables used in this study are the number of independent commissioners (IND_COM), the percentage of members who are independent commissioners (COM_PERC), firm size (SIZE), firm growth (GRO), dividend payout (DIV), firm age (AGE), loan to deposit ratio (LDR), and non-performing loan ratio (NPL). All the variables are defined in Table 2.

3.3. Empirical Models and Endogeneity Anticipation

To better understand the argument and the main aim of this study, we visualize the proposed hypotheses in a research design model. As seen in Figure 1, we deliberately test the main concept of female executives and critical mass on firm (bank) performance.

The proposed concepts are further operationalized into more measurable parameters, and thus we employ several proxies to measure female executives and critical mass. Meanwhile, firm (bank) performance is surrogated by the main dependent variables, namely ROA, ROE and NIM.

Table 2. Variable definition.

| No.	Variable	Definition	Formula	Data form	Source
Dependent variables					
1	ROA	Return on assets	Net income / Total assets	Continuous	IDX
2	ROE	Return on equity	Net income / Stockholders' equity	Continuous	IDX
3	NIM	Net interest margin	Net interest income / Average earning assets	Continuous	IDX
Main independent variables of interest					
4	FEM1	Female executives 1	1 if the CEO is female and 0 otherwise	Binary	IDX
5	FEM2	Female executives 2	1 if the CFO is female and 0 otherwise	Binary	IDX
6	FEM3	Female executives 3	1 if there is at least one female executive on the board of management and 0 otherwise	Binary	IDX
7	FEM4	Female executives 4	The percentage of female members on the board of management	Continuous	IDX
8	FEM5	Female executives 5	The number of female members on the board of management	Continuous	IDX
9	CM	Critical mass of female executives	1 if there are at least three female members on the board of management and 0 otherwise	Binary	IDX
Control variables					
10	IND_COM	Number of independent commissioners	The number of independent members on the board of commissioners	Continuous	IDX
11	COM_PERC	Proportion of independent commissioners	The percentage of independent members on the board of commissioners	Continuous	IDX
12	SIZE	Firm size	Logarithm natural of total asset	Continuous	IDX
13	GRO	Firm growth	$\dfrac{\text{Total assets}_t - \text{Total assets}_{t-1}}{Total\ assets_{t-1}}$	Continuous	IDX
14	DIV	Dividends	1 if the firm paid dividends and 0 otherwise	Binary	IDX
15	AGE	Firm age	The observed fiscal year minus the firm's inception year	Continuous	IDX
16	LDR	Loan to deposit ratio	$\dfrac{\text{Total amount of loans}}{\text{Total amount of deposits}}$ X 100%	Continuous	IDX
17	NPL	Non-performing loan ratio	$\dfrac{\text{Non-performing loans}}{\text{Total loans}}$ X 100%	Continuous	IDX
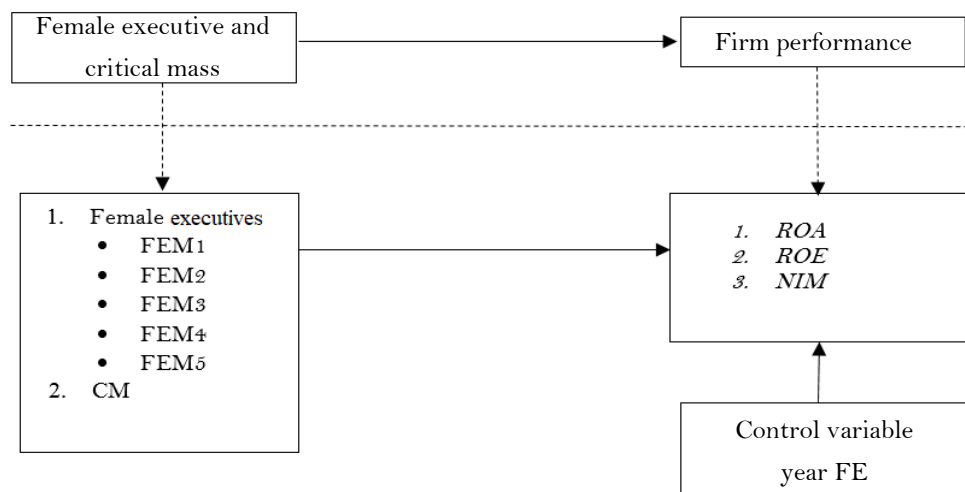
Figure 1. Research model.

The statistical technique employed in this study is a panel data regression analysis in which we combined the time series (10 years) and cross-sectional (29 banks) data sets. Since Hypothesis 1 was proxied by five different

surrogate indicators (FEM1, FEM2, FEM3, FEM4, and FEM5), we divided the empirical model used to test both hypotheses into six separate statistical notations. Therefore, the regression models utilized to test the hypotheses are as follows:

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{FEM1}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (1)$$

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{FEM2}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (2)$$

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{FEM3}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (3)$$

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{FEM4}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (4)$$

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{FEM5}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (5)$$

$$\text{PERFORMANCE } (1,2,3)_{i,t} = \alpha + \beta_1 \text{CM}_{i,t} + \Sigma \text{ Controls} + \Sigma \text{ Year FE} + \varepsilon_{it} \qquad (6)$$

In Equations 1–6, PERFORMANCE is defined as bank performance, and the numbers in parentheses (1,2,3) indicate that bank performance is proxied by three different variables: ROA (1), ROE (2), and NIM (3). Since we used panel data, subscript i represents firm I, and subscript t represents the time point (year) t. FEM1, FEM2, FEM3, FEM4, and FEM5 were used interchangeably to represent the main independent variable, while CM was operationalized as the critical mass of female members on the board of management. We simplified the notation by using the abbreviations IND_COM, COM_PERC, SIZE, GRO, DIV, AGE, LDR, and NPL to denote the sigma of control variables.

We used the year fixed effect to capture the aggregate effect of time series trends and changes in parameters measured over time. The year fixed effect also enabled us to identify any variations in the dependent variable that occurred over time and could be considered unrelated to the remaining explanatory variable in the model.

4. RESULTS AND DISCUSSIONS

4.1. Descriptive Statistics

Table 3 displays the basic information obtained from the descriptive statistics analysis. We winsorized continuous variables at the 1% and 99% levels when calculating statistics from the data set to reduce the effect of outliers. The three measures of firm performance (ROA, ROE, and NIM) presented mean scores of 1.4% (0.014), 9.8% (0.098), and 5.3% (0.053), respectively. We assigned five surrogates to the main independent variable, each of which presented diverse mean scores. Female CEOs (FEM1) accounted for an average of 6.9% of all observations. Meanwhile, female CFOs (FEM2) represented a larger proportion with an average of 18.6%. The presence of female members on the board of management (FEM3) had a high average percentage of 80.3% of the total observations. The proportion of female members on the board of management (FEM4) averaged at 14% of the total observations. Finally, the average number of female members on the board of management (FEM5) was 1.84; that is, the average board of management had one or two female members. Furthermore, from all observations, only 27% of companies met or exceeded the critical mass of three or more female executives on their boards of management.

In summary, the descriptive statistics indicate that the proportion of female members on boards of management is low, although the presence of female members is high. The number of female members on the average board of directors is also low. These results indicate that the presence of female members on boards of management tends to reflect tokenism.

Table 3. Descriptive statistics.

No.	Variable	N	Mean	SD	Min.	p25th	p50th	p75th	Max.
1	ROA	290	0.014	0.022	-0.096	0.008	0.017	0.026	0.051
2	ROE	290	0.098	0.175	-0.838	0.059	0.108	0.183	0.425
3	NIM	290	0.053	0.023	0.009	0.041	0.050	0.060	0.131
4	FEM1	290	0.069	0.254	0	0	0	0	1
5	FEM2	290	0.186	0.390	0	0	0	0	1
6	FEM3	290	0.803	0.398	0	1	1	1	1
7	FEM4	290	0.140	0.109	0	0.067	0.125	0.200	0.429
8	FEM5	290	1.841	1.555	0	1	2	3	7
9	CM	290	0.272	0.446	0	0	0	1	1
10	IND_COM	290	0.293	1.049	0	2	3	4	5
11	COM_PERC	290	0.562	0.147	0	0.500	0.571	0.667	1
12	SIZE	290	31.52	1.631	28.36	30.17	31.72	32.78	34.80
13	GRO	290	0.173	0.232	-0.193	0.053	0.140	0.229	1.641
14	DIV	290	0.466	0.500	0	0	0	1	1
15	AGE	290	44.81	19.80	1	28	45	57	106
16	LDR	290	0.848	0.138	0.506	0.787	0.860	0.918	1.407
17	NPL	290	0.017	0.013	0	0.007	0.013	0.023	0.050

Note: ROA: Returns on assets; ROE: Return on equity; NIM: Net interest margin; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: The percentage of female members on the board of management and 0 otherwise; FEM5: The number of female members on the board of management; CM: Critical mass of female executives (1 if there are at least three female members on the board of management and 0 otherwise); IND_COM: Number of independent commissioners; COM_PERC: Proportion of independent commissioners; Size: Firm size; GRO: Firm growth; DIV: Dividend payout; AGE: Firm age; LDR: Loan to deposit ratio; NPL: Non-performing loan ratio.
The continuous variables (ROA, ROE, NIM, FEM4, FEM5, IND_COM, COM_PERC, SIZE, GRO, AGE, LDR, and NPL) were winsorized at the 1% and 99% levels.

4.2. Correlation Analysis

Table 4 presents the Pearson correlation test results, which show that female executives are proxied using female CFOs, and the number of women board members is positively correlated with ROA at a significance level of 5%, and the presence of female board members is positively correlated with ROA at a significance level of 1%. Positive correlations are also found between female CFOs and ROE at the 10% significance level and between female executives (proxied using the presence of women on the management board) and ROE at the 5% significance level. Three measures of female executives—the presence of women on the management board, the number of women on the management board, and the presence of at least three women on the management board—are positively correlated with NIM at significance levels of 10%, 5%, and 10%, respectively. The presence of women on the management board is the only proxy for female executives that was significantly correlated with all three performance measures.

A high correlation coefficient value (0.84) is found between ROE and ROA at a significance level of 1%. However, because both variables are proxies of performance that are not operated on within the same model in the regression analysis, the high correlation coefficient value does not create a multicollinearity issue in this study. Similarly, high correlation coefficients are found between the number of women on the management board and the percentage of women on the management board (0.89) and between the critical mass of women on the management board and the number of women on the management board (0.80), both at a significance level of 1%. However, because these three variables are proxies of female executives and are used separately in the regression analysis of the dependent variables, the high correlation coefficients do not indicate a multicollinearity problem in this study.

Table 4. Pearson correlation matrix.

No.	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	ROA	1.00																
2	ROE	0.84***	1.00															
3	NIM	0.44***	0.36***	1.00														
4	FEM1	-0.02	0.06	-0.06	1.00													
5	FEM2	0.12*	0.12*	0.08	0.08	1.00												
6	FEM3	0.16**	0.16**	0.14*	0.14*	0.24***	1.00											
7	FEM4	0.04	0.04	0.09	0.14*	0.35***	0.63***	1.00										
8	FEM5	0.14*	0.11	0.15**	0.13*	0.37***	0.58***	0.89***	1.00									
9	CM	0.06	0.06	0.11	0.05	0.46***	0.30***	0.71***	0.80***	1.00								
10	IND_COM	0.28***	0.25***	0.13*	0.15*	0.15*	0.31***	0.15**	0.36***	0.31***	1.00							
11	COM_PERC	0.04	0.05	-0.08	-0.06	-0.06	-0.04	-0.05	-0.15*	-0.09	0.31***	1.00						
12	SIZE	0.44***	0.37***	0.22***	-0.12*	0.27***	0.41***	0.15*	0.41***	0.31***	0.64***	-0.08	1.00					
13	GRO	0.20***	0.12*	0.05	-0.04	-0.03	-0.17**	-0.15*	-0.16**	-0.15*	-0.08	0.04	-0.17**	1.00				
14	DIV	0.43***	0.36***	0.29***	-0.17**	0.12*	0.03	-0.09	0.002	0.07	0.24***	-0.01	0.42***	0.05	1.00			
15	AGE	0.12*	0.14*	-0.04	0.25***	0.24***	0.16**	0.13*	0.27***	0.25***	0.39***	-0.09	0.31***	-0.05	0.12*	1.00		
16	LDR	0.12*	0.02	0.13*	0.04	0.11	0.06	0.13*	0.23***	0.20***	0.27***	-0.04	0.21***	0.15*	0.18**	0.23***	1.00	
17	NPL	-0.59***	-0.46***	-0.32***	-0.07	-0.10	-0.05	-0.01	-0.12*	-0.13*	-0.28***	0.02	-0.34***	-0.19**	-0.32***	-0.27***	-0.14*	1.00

Note: ROA: Returns on assets; ROE: Return on equity; NIM: Net interest margin; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: The percentage of female members on the board of management and 0 otherwise; FEM5: The number of female members on the board of management; CM: Critical mass of female executives (1 if there are at least three female members on the board of management and 0 otherwise); IND_COM: Number of independent commissioners; COM_PERC: Proportion of independent commissioners; Size: Firm size; GRO: Firm growth; DIV: Dividend payout; AGE: Firm age; LDR: Loan to deposit ratio; NPL: Non-performing loan ratio.
*** p < 0.01, ** p < 0.05, * p < 0.1 indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed).

4.3. Discussion

Tables 5, 6, and 7 present the results of the primary analysis that relates female executives to bank performance with data panel regression distinguished by three surrogate indicators of dependent variables (ROA, ROE, and NIM). Hypothesis 1 predicted that female executives positively influence bank performance, while Hypothesis 2 claimed that the critical mass of female board members improves bank performance.

The empirical evidence related to Hypothesis 1 shows that there is generally no statistically significant relationship between female executives and bank performance. This finding is consistent across most of the measures of female executives (FEM2, FEM3, FEM4, and FEM5) and the three bank performance variables (ROA, ROE, and NIM). Therefore, Hypothesis 1 is not supported. This indicates that firms do not benefit from the presence of female executives. This evidence is in line with the findings of recent studies (Fernández-Temprano & Tejerina-Gaite, 2020; Wang, 2020; Yar & Ahmed, 2020) but contradicts the results of other prior studies (Assenga et al., 2018; Cardillo et al., 2021; García-Meca et al., 2015). Although most research results from developed countries show that the presence of female executives enhances company performance, Indonesia has unique conditions, which likely led to the conflicting results of the present study. This idea is supported by Alazzani, Hassanein, and Aljanadi (2017), who argued that female executives' roles on management boards might vary by country and culture.

Table 5. Panel data regression analysis using return on assets (ROA) as the dependent variable.

Variable	ROA					
	(1)	(2)	(3)	(4)	(5)	(6)
IND_COM	−0.038 (−0.207)	0.044 (0.235)	0.0404 (0.220)	0.0432 (0.235)	0.037 (0.197)	0.053 (0.288)
COM_PERC	0.011 (1.291)	0.008 (0.827)	0.007 (0.828)	0.007 (0.805)	0.007 (0.844)	0.007 (0.805)
SIZE	0.413 (1.080)	0.546 (1.415)	0.536 (1.390)	0.552 (1.434)	0.542 (1.404)	0.576 (1.489)
GRO	0.016*** (3.503)	0.014*** (3.004)	0.015*** (3.081)	0.015*** (3.073)	0.014*** (3.020)	0.014*** (2.924)
DIV	0.385 (1.151)	0.479 (1.416)	0.425 (1.240)	0.451 (1.326)	0.463 (1.354)	0.509 (1.498)
AGE	−0.046 (−0.684)	−0.079 (−1.187)	−0.0786 (−1.181)	−0.081 (−1.209)	−0.079 (−1.191)	−0.081 (−1.214)
LDR	0.005 (0.438)	0.004 (0.354)	0.004 (0.371)	0.004 (0.364)	0.004 (0.355)	0.004 (0.369)
NPL	−0.322*** (−2.767)	−0.363*** (−3.085)	−0.360*** (−3.068)	−0.354*** (−2.999)	−0.360*** (−3.045)	−0.369*** (−3.135)
FEM1	1.694*** (2.864)					
FEM2		−0.001 (−0.002)				
FEM3			0.336 (0.920)			
FEM4				0.009 (0.716)		
FEM5					0.032 (0.302)	
CM						−0.226 (−0.799)
Constant	−10.32 (−1.041)	−12.75 (−1.268)	−12.72 (−1.268)	−13.03 (−1.298)	−12.66 (−1.260)	−13.60 (−1.348)
Observations	290	290	290	290	290	290
R-squared	0.242	0.217	0.220	0.219	0.217	0.219
Number of banks id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
*** $p < 0.01$.
IND_COM: Number of independent commissioners; COM_PERC: Proportion of independent commissioners; Size: Firm size; GRO: Firm growth; DIV: Dividend payout; AGE: Firm age; LDR: Loan to deposit ratio; NPL: Non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: The percentage of female members on the board of management and 0 otherwise; FEM5: The number of female members on the board of management; CM: Critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

Table 6. Panel data regression analysis using return on equity (ROE) as the dependent variable.

Variable	ROE					
	(1)	(2)	(3)	(4)	(5)	(6)
IND_COM	-1.400 (-0.829)	-0.249 (-0.143)	-0.344 (-0.200)	-0.321 (-0.186)	-0.362 (-0.208)	-0.304 (-0.176)
COM_PERC	0.192** (2.395)	0.137* (1.670)	0.139* (1.699)	0.137* (1.678)	0.140* (1.708)	0.139* (1.695)
SIZE	8.697** (2.465)	10.430*** (2.879)	10.38*** (2.868)	10.520*** (2.906)	10.440*** (2.880)	10.510*** (2.887)
GRO	0.034 (0.788)	0.003 (0.067)	0.006 (0.147)	0.007 (0.154)	0.004 (0.094)	0.003 (0.062)
DIV	1.371 (0.444)	2.626 (0.827)	2.184 (0.678)	2.383 (0.746)	2.524 (0.786)	2.667 (0.834)
AGE	-1.305** (-2.124)	-1.768*** (-2.820)	-1.747*** (-2.797)	-1.764*** (-2.821)	-1.754*** (-2.804)	-1.755*** (-2.806)
LDR	-0.077 (-0.776)	-0.091 (-0.879)	-0.087 (-0.845)	-0.088 (-0.850)	-0.0885 (-0.858)	-0.088 (-0.856)
NPL	-2.267** (-2.108)	-2.820** (-2.553)	-2.784** (-2.523)	-2.731** (-2.462)	-2.785** (-2.511)	-2.815** (-2.545)
FEM1	22.510*** (4.121)					
FEM2		1.256 (0.335)				
FEM3			2.715 (0.792)			
FEM4				0.075 (0.649)		
FEM5					0.196 (0.199)	
CM						-0.348 (-0.131)
Constant	-201.4** (-2.200)	-232.1** (-2.458)	-233.5** (-2.478)	-236.1** (-2.503)	-233.1** (-2.470)	-235.0** (-2.477)
Observations	290	290	290	290	290	290
R-squared	0.244	0.191	0.193	0.192	0.191	0.191
Number of id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
IND_COM: Number of independent commissioners; COM_PERC: Proportion of independent commissioners; Size: Firm size; GRO: Firm growth; DIV: Dividend payout; AGE: Firm age; LDR: Loan to deposit ratio; NPL: Non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: The percentage of female members on the board of management and 0 otherwise; FEM5: The number of female members on the board of management; CM: Critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

Indonesia has a multicultural and multireligious population, with Islam being the dominant belief system (Suherman et al., 2021). Of the various ethnic groups in Indonesia, the Javanese are the dominant group and have a strong influence on the organizational structure in Indonesia (Irawanto, Ramsey, & Ryan, 2011). Javanese society adopts a paternalistic culture (Selvarajah & Meyer, 2017) as a managerial ideology in which men are considered leaders while women are not; these values are also contained in Islamic teachings (Sposato & Rumens, 2021). From a cultural perspective, in Indonesia, the presence of females on a management board might lead to tokenism, by which females are only seen as representatives of women and not as individuals; thus, females have to work very hard to have their opinions heard (Konrad et al., 2008). Therefore, in such situations, female executives' influences on company decisions are too weak (Kanter, 1977) to affect the company's performance.

When considering other measures of female executives, the variable of female CEOs was the only one that had a positive association with any of the bank performance variables, namely ROA (β = 1.694, p < 0.01) and ROE (β = 22.51, p < 0.01). This evidence is consistent with previous studies by Ullah et al. (2020) and Peni (2014), who argued that female CEOs, as the top decision makers in companies, are likely to augment firm performance due to their higher aversion to risk compared to their male counterparts. When female CEOs encounter investment decisions, they tend to make less risky investments than males, which can improve firm performance (Assenga et al., 2018).

Regarding Hypothesis 2, which proposed that the relationship between female executives and bank performance is non-linear, we used critical mass theory to test whether the presence of three or more female executives on a management board improved bank performance. The critical mass (denoted as CM in Tables 5, 6, and 7) data show that it does not affect bank performance. This result is consistent across the three surrogate indicators of bank performance (ROA, ROE, and NIM). Thus, Hypothesis 2 is not supported.

Moreover, the critical mass test of the presence of female executives on a management board does not significantly affect bank performance. Hence, tokenism is not the only issue that weakens the influence of female executives on firm performance. Claessens et al. (2000) stated that public companies in Indonesia are dominated by family firms, which are predominantly controlled by the families that own them. Therefore, the presence of women on the management boards of banks seems to be driven more by their family relationships with the controlling shareholders than by their expertise or experience (Darmadi, 2011). As such, female executives are not typically the best candidates and their presence does not often affect a bank's performance.

Table 7. Panel data regression analysis using net interest margin (NIM) as the dependent variable.

Variable	NIM					
	(1)	(2)	(3)	(4)	(5)	(6)
IND_COM	0.114 (0.748)	0.143 (0.947)	0.135 (0.899)	0.136 (0.903)	0.132 (0.869)	0.142 (0.942)
COM_PERC	-0.002 (-0.275)	-0.003 (-0.460)	-0.003 (-0.431)	-0.003 (-0.439)	-0.003 (-0.418)	-0.003 (-0.450)
SIZE	-0.551* (-1.736)	-0.518 (-1.642)	-0.517 (-1.638)	-0.512 (-1.625)	-0.517 (-1.638)	-0.495 (-1.563)
GRO	-0.005 (-1.409)	-0.006 (-1.601)	-0.006 (-1.563)	-0.006 (-1.549)	-0.006 (-1.562)	-0.006 (-1.643)
DIV	0.175 (0.629)	0.201 (0.726)	0.188 (0.671)	0.192 (0.689)	0.191 (0.682)	0.219 (0.789)
AGE	-0.103* (-1.866)	-0.114** (-2.086)	-0.112** (-2.059)	-0.113** (-2.068)	-0.112** (-2.063)	-0.113** (-2.080)
LDR	-0.005 (-0.566)	-0.006 (-0.617)	-0.005 (-0.586)	-0.005 (-0.587)	-0.005 (-0.590)	-0.005 (-0.580)
NPL	-0.038 (-0.395)	-0.051 (-0.527)	-0.0487 (-0.506)	-0.047 (-0.483)	-0.047 (-0.489)	-0.053 (-0.550)
FEM1	0.461 (0.939)					
FEM2		0.135 (0.414)				
FEM3			0.073 (0.244)			
FEM4				0.003 (0.256)		
FEM5					0.019 (0.219)	
CM						-0.144 (-0.620)
Constant	27.31*** (3.318)	26.82*** (3.261)	26.66*** (3.245)	26.57*** (3.231)	26.70*** (3.249)	26.11*** (3.163)
Observations	290	290	290	290	290	290
R-squared	0.224	0.221	0.221	0.221	0.221	0.222
Number of id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
IND_COM: Number of independent commissioners; COM_PERC: Proportion of independent commissioners; Size: Firm size; GRO: Firm growth; DIV: Dividend payout; AGE: Firm age; LDR: Loan to deposit ratio; NPL: Non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: The percentage of female members on the board of management and 0 otherwise; FEM5: The number of female members on the board of management; CM: Critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

4.4. Robustness Check

To check the robustness of our findings and overcome the dynamic endogeneity issue (Bennouri et al., 2018; Wintoki, Linck, & Netter, 2012), we employed different models by using lagged independent variables as a function of bank performance. We regressed a one-year time lag, referred to as one-year lagged independent variables (t-1), for all surrogate dependent variables as represented by the information in Table 8 (ROA), Table 9 (ROE), and Table 10 (NIM). The robustness check results are consistent with the results of our primary analysis in which both of our hypotheses are not supported. None of the proxies of female executives and critical mass exhibited a significant effect on bank performance.

Table 8. Panel data regression analysis using lagged variables to explain ROA.

Variable	ROA					
	(1)	(2)	(3)	(4)	(5)	(6)
IND_COM (-1)	-0.085 (-0.407)	-0.025 (-0.121)	-0.035 (-0.168)	-0.025 (-0.119)	-0.038 (-0.182)	-0.031 (-0.149)
COM_PERC (-1)	0.005 (0.433)	0.001 (0.134)	0.002 (0.162)	0.00120 (0.109)	0.002 (0.167)	0.002 (0.145)
SIZE (-1)	-0.932** (-2.165)	-0.850** (-1.979)	-0.840* (-1.961)	-0.831* (-1.937)	-0.846** (-1.972)	-0.853** (-1.974)
GRO (-1)	0.018*** (3.658)	0.017*** (3.414)	0.017*** (3.456)	0.017*** (3.465)	0.017*** (3.419)	0.017*** (3.396)
DIV (-1)	0.229 (0.626)	0.285 (0.776)	0.237 (0.639)	0.251 (0.683)	0.253 (0.684)	0.266 (0.720)
AGE (-1)	0.097 (1.226)	0.078 (0.989)	0.080 (1.020)	0.077 (0.976)	0.077 (1.000)	0.081 (1.026)
LDR (-1)	0.001 (0.082)	-0.001 (-0.042)	0.000 (0.010)	0.000 (0.001)	-0.000 (-0.016)	-0.001 (-0.036)
NPL (-1)	-0.260* (-1.817)	-0.296** (-2.087)	-0.294** (-2.078)	-0.285** (-1.992)	-0.293** (-2.060)	-0.299** (-2.115)
FEM1 (-1)	0.990 (1.573)					
FEM2 (-1)		0.197 (0.402)				
FEM3 (-1)			0.291 (0.735)			
FEM4 (-1)				0.009 (0.686)		
FEM5 (-1)					0.047 (0.404)	
CM (-1)						0.074 (0.234)
Constant	26.39** (2.389)	24.87** (2.246)	24.26** (2.198)	24.19** (2.190)	24.68** (2.234)	24.89** (2.235)
Observations	261	261	261	261	261	261
R-squared	0.208	0.199	0.201	0.200	0.199	0.199
Number of id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
IND_COM: number of independent commissioners; COM_PERC: proportion of independent commissioners; Size: firm size; GRO: firm growth; DIV: dividend payout; AGE: firm age; LDR: loan to deposit ratio; NPL: non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: the percentage of female members on the board of management and 0 otherwise; FEM5: the number of female members on the board of management; CM: critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

Table 9. Panel data regression analysis using lagged variables to explain ROE.

Variable	ROE					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
IND_COM (-1)	–0.634 (–0.337)	–0.084 (–0.045)	–0.171 (–0.092)	–0.096 (–0.052)	–0.190 (–0.101)	–0.131 (–0.070)
COM_PERC (-1)	0.055 (0.553)	0.025 (0.255)	0.028 (0.283)	0.0231 (0.234)	0.028 (0.287)	0.027 (0.276)
SIZE (-1)	1.777 (0.459)	2.454 (0.637)	2.582 (0.670)	2.682 (0.696)	2.551 (0.662)	2.687 (0.692)
GRO (-1)	0.109** (2.440)	0.097** (2.203)	0.098** (2.196)	0.102** (2.269)	0.097** (2.179)	0.094** (2.116)
DIV (-1)	–0.250 (–0.076)	0.307 (0.093)	–0.033 (–0.010)	–0.083 (–0.025)	0.035 (0.011)	0.224 (0.068)
AGE (-1)	–0.888 (–1.254)	–1.065 (–1.506)	–1.034 (–1.465)	–1.067 (–1.512)	–1.041 (–1.474)	–1.039 (–1.471)
LDR (-1)	0.080 (0.685)	0.066 (0.558)	0.070 (0.593)	0.072 (0.609)	0.069 (0.581)	0.068 (0.573)
NPL (-1)	–0.664 (–0.517)	–0.956 (–0.751)	–0.991 (–0.779)	–0.865 (–0.674)	–0.984 (–0.769)	–1.034 (–0.814)
FEM1 (-1)	8.693 (1.536)					
FEM2 (-1)		2.805 (0.638)				
FEM3 (-1)			1.388 (0.390)			
FEM4 (-1)				0.092 (0.770)		
FEM5 (-1)					0.249 (0.239)	
CM (-1)						–0.678 (–0.240)
Constant	–14.25 (–0.144)	–25.78 (–0.259)	–31.71 (–0.319)	–33.97 (–0.342)	–29.67 (–0.299)	–33.36 (–0.333)
Observations	261	261	261	261	261	261
R-squared	0.173	0.166	0.165	0.166	0.164	0.164
Number of id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
IND_COM: number of independent commissioners; COM_PERC: proportion of independent commissioners; Size: firm size; GRO: firm growth; DIV: dividend payout; AGE: firm age; LDR: loan to deposit ratio; NPL: non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: the percentage of female members on the board of management and 0 otherwise; FEM5: the number of female members on the board of management; CM: critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

Table 10. Panel data regression analysis using lagged variables to explain NIM.

Variable	NIM					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
IND_COM (-1)	0.142 (0.852)	0.121 (0.737)	0.110 (0.668)	0.115 (0.694)	0.102 (0.614)	0.106 (0.643)
COM_PERC (-1)	–0.008 (–0.903)	–0.007 (–0.750)	–0.006 (–0.707)	–0.007 (–0.744)	–0.006 (–0.680)	–0.006 (–0.716)
SIZE (-1)	–0.294 (–0.855)	–0.367 (–1.076)	–0.345 (–1.011)	–0.337 (–0.988)	–0.351 (–1.028)	–0.384 (–1.118)
GRO (-1)	0.004 (0.879)	0.005 (1.193)	0.004 (1.123)	0.005 (1.214)	0.005 (1.186)	0.005 (1.237)
DIV (-1)	0.075 (0.258)	0.078 (0.265)	0.046 (0.154)	0.033 (0.111)	0.027 (0.093)	0.022 (0.076)
AGE (-1)	–0.123* (–1.960)	–0.119* (–1.910)	–0.114* (–1.823)	–0.117* (–1.86)	–0.116* (–1.847)	–0.112* (–1.798)
LDR (-1)	–0.010 (–0.918)	–0.009 (–0.864)	–0.009 (–0.829)	–0.009 (–0.804)	–0.009 (–0.812)	–0.009 (–0.847)
NPL (-1)	–0.041 (–0.359)	–0.007 (–0.059)	–0.017 (–0.153)	–0.006 (–0.054)	–0.010 (–0.091)	–0.014 (–0.123)

Variable	NIM					
	(1)	(2)	(3)	(4)	(5)	(6)
FEM1 (-1)	-0.558 (-1.110)					
FEM2 (-1)		0.481 (1.237)				
FEM3 (-1)			0.033 (0.106)			
FEM4 (-1)				0.007 (0.660)		
FEM5 (-1)					0.051 (0.551)	
CM (-1)						0.240 (0.959)
Constant	20.65** (2.341)	22.46** (2.556)	21.65** (2.460)	21.40** (2.433)	21.81** (2.481)	22.76** (2.572)
Observations	261	261	261	261	261	261
R-squared	0.217	0.218	0.213	0.214	0.214	0.216
Number of id	29	29	29	29	29	29
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors are enclosed in parentheses.
** $p < 0.05$, * $p < 0.1$
IND_COM: number of independent commissioners; COM_PERC: proportion of independent commissioners; Size: firm size; GRO: firm growth; DIV: dividend payout; AGE: firm age; LDR: loan to deposit ratio; NPL: non-performing loan; FEM1: 1 if the CEO is female and 0 otherwise; FEM2: 1 if the CFO is female and 0 otherwise; FEM3: 1 if there is at least one female executive on the board of management and 0 otherwise; FEM4: the percentage of female members on the board of management and 0 otherwise; FEM5: the number of female members on the board of management; CM: critical mass of female executives, 1 if there are at least three female members on the board of management and 0 otherwise.

5. CONCLUSION

Based on data collected from 29 banks listed on the Indonesia Stock Exchange from 2010–2019, we investigated whether having female executives on management boards affected bank performance. Specifically, we considered the non-linear relationship between female executives and bank performance and, therefore, this study also employed critical mass theory (Konrad & Kramer, 2006; Konrad et al., 2008).

In general, the findings of this study did not reveal any significant effects of female executives on bank performance; these findings were confirmed by robustness checks. A similar approach was utilized to discover whether the critical mass of female executives influences bank performance. Again, the results were insignificant. Interestingly, while most of our proxies of female executives indicated no association with bank performance, female CEOs significantly improved banks' ROA and ROE.This study provides two noteworthy insights. First, it shows the lack of an association between female executives and bank performance in the developing capital market of Indonesia. Second, this study contributes to the literature on critical mass theory. Previous studies primarily based their arguments on the correlation between the critical mass of female executives on boards of management and firm performance, and this study showed that female CEOs can significantly improve bank performance.

Given the absence of a significant relationship between female executives and bank performance, it could be that female executives were not found to influence bank performance because of the unique culture and ownership structure of Indonesian banks. Female CEOs was the only proxy of female executives that had a positive effect on ROA and ROE during the study period, perhaps because female CEOs are more risk-averse than men.

As a final note, our evidence does not support critical mass theory, as we did not find that the inclusion of at least three females on management boards improves firm performance. However, this outcome might be different if female executives were assigned to bank management boards based on their expertise and experience instead of their family connections. We recommend that researchers address this matter in future studies.

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