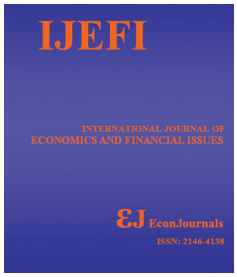

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Dual-Board Gender Diversity and Firm Performance: Evidence from Indonesia's Financial Sector with Macroeconomic as a Moderator

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ABSTRACT

This study examines the influence of board gender diversity on the financial performance of Indonesian financial institutions, with a particular focus on the distinct roles of female directors and female commissioners. Drawing on panel data from 2018 to 2023, covering both banking and non-banking sectors, and employing random-effect regression models in Stata, the analysis further incorporates macroeconomic factors gross domestic product (GDP) and interest rates—as potential moderators. The results reveal heterogeneous effects across board positions and industry segments. Female directors exert a significant positive impact on return on equity (ROE) in the banking sector, underscoring their strategic contributions in highly regulated and risk-intensive environments. In contrast, their influence in non-banking firms is not significant, where male directors continue to dominate performance outcomes. Female commissioners display a consistently positive effect in the banking sector, even after firm-level controls, highlighting their substantive monitoring role. However, in non-banking firms, their initial significance diminishes once controls and moderating factors are introduced, suggesting a more symbolic presence. Macroeconomic conditions further differentiate the outcomes: GDP shows no moderating effect, while interest rates are decisive-positively influencing bank performance but negatively affecting non-banks. These findings demonstrate that the effectiveness of gender diversity is not universal but contingent upon board function, industry context, and external economic conditions. The study contributes to agency, resource dependence, and contingency theories by providing evidence from an emerging market context. Practically, the findings suggest the need for sector-specific policies to strengthen female participation, particularly in banking, and encourage firms to empower women in strategic decision-making roles.

Keywords: Board Gender Diversity, Female Directors, Female Commissioners, Financial Performance, Macroeconomic Moderation
JEL Classifications: G20, E52, M41, C33

1. INTRODUCTION

Gender diversity in corporate governance has emerged as a central issue in the literature over the past two decades. Numerous studies highlight that the presence of women on corporate boards, both directors and commissioners can influence strategic decision-making processes and, ultimately, shape firms' financial performance (Adams and Ferreira, 2009; Terjesen et al., 2009). Hence, female participation is not merely a matter of equality but an important instrument for enhancing governance effectiveness through broader perspectives, stronger ethical orientation, and more inclusive approaches (Carter et al., 2010; Gul et al., 2011).

Nevertheless, empirical findings remain inconclusive. While some studies report that female representation contributes positively to efficiency and profitability (Ahmed et al., 2024; Bayly et al., 2024; Liu et al., 2014; Tleubayev et al., 2020; Vishwakarma, 2017), others find neutral or even negative effects, depending on governance quality and institutional context (Adams and Ferreira, 2009; Post and Byron, 2014; Wang, 2020; Yildiz et al., 2019). These discrepancies suggest that the impact of gender diversity on

firm performance is highly contextual, shaped by board structure, industry characteristics, and external conditions.

The Indonesian context offers unique complexity. Unlike the Anglo-American one-tier model, Indonesia adopts a two-tier governance system, in which directors focus on management and strategy, while commissioners serve a supervisory role (Pranata and Laela, 2020; Syahuri et al., 2022; Werlauff, 2009; Yeh et al., 2011). Much of the prior research has tended to aggregate all board members without distinguishing between these functions, leaving unanswered how gender diversity within each tier affects firm performance.

Theoretically, agency theory emphasizes the monitoring role of commissioners, resource dependence theory underscores the value of diversity in providing resources and legitimacy, while contingency theory highlights that the effectiveness of boards depends on external conditions (Donaldson, 2001; Hillman et al., 2009).

Recent studies also stress the importance of incorporating macroeconomic factors. Jiang et al. (2021) and Kaluarachchi (2025) show that economic growth and market volatility moderate the relationship between gender diversity and financial outcomes, particularly in financial sectors that are highly sensitive to macroeconomic conditions (Abaidoo and Agyapong, 2023; Bayar, 2019; Cvetković et al., 2021; Ki and Adhikari, 2022; Nmadu et al., 2020; Tiwari et al., 2021). Key macro indicators, such as gross domestic product (GDP) and interest rates, are proven determinants of financial sector performance (Bunjaku, 2024; Sedláček and Němec, 2018; Yoon et al., 2023; Zhao and Sun, 2020). Yet, their moderating role within gender diversity literature remains underexplored, especially in emerging markets.

Against this backdrop, this study addresses several research gaps. First, only a few studies explicitly differentiate the effects of male and female directors as well as male and female commissioners on financial performance, particularly in two-tier systems such as Indonesia. Second, sectoral variations between banking and non-banking financial institutions are rarely considered, despite the differences in regulation and market dynamics. Third, macroeconomic moderators such as GDP and interest rates have received limited attention, even though they are highly relevant to the financial industry.

Accordingly, this study contributes by:

1. Distinguishing the roles of female directors and female commissioners in influencing financial performance
2. Comparing banking and non-banking financial institutions to assess sectoral variations in gender diversity effects
3. Examining the moderating role of macroeconomic conditions (GDP and interest rates) in the gender diversity–performance nexus
4. Providing empirical evidence from Indonesia, one of Southeast Asia's largest financial markets with a unique governance structure.

By adopting this approach, the study not only enriches gender-based corporate governance literature but also offers practical insights for regulators, firms, and investors seeking to understand the strategic value of gender diversity in emerging markets.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Board Gender Diversity and Firm Performance

The debate on gender diversity at the board level has become increasingly prominent in corporate governance research. Early discussions were largely rooted in agency theory (Jensen and Meckling, 1976), which emphasizes the board's monitoring role. Female directors are often perceived to bring more cautious and independent perspectives, thereby enhancing monitoring effectiveness (Adams and Ferreira, 2009). From the perspective of resource dependence theory (Hillman et al., 2009; Pfeffer and Salancik, 1978), gender diversity expands access to networks, strengthens external legitimacy, and improves the firm's strategic capacity.

Empirical findings provide mixed support. Liu et al. (2014) report that Chinese firms with female directors tend to achieve higher return on equity (ROE). A meta-analysis by Post and Byron (2014) shows that the positive effects of female representation are stronger in countries with higher investor protection. Similarly, Ouni et al. (2022) demonstrate that female commissioners contribute to efficiency improvements in Tunisian firms. More recently, Ahmed et al. (2024) confirm that gender diversity strengthens internal control mechanisms, particularly in financial institutions.

Yet, other studies highlight potential drawbacks. Adams and Ferreira (2009) caution that in firms with strong governance, women's presence may increase the risk of over-monitoring, reducing managerial flexibility. Ahern and Dittmar (2011) even find that gender quota policies in Norway initially reduced firm value during implementation. These divergent results indicate that the link between gender diversity and financial performance is not universal but highly contingent on institutional and governance contexts.

H_1: Female directors positively influence firm financial performance.

2.2. Female Commissioners and the Monitoring Function

Within Indonesia's two-tier governance system, commissioners play a central supervisory role. From an agency theory perspective, the presence of female commissioners is expected to strengthen independence and enhance board accountability (Carter et al., 2010). Empirical evidence supports this claim: Gulamhussen and Santa (2015) find that female commissioners in banking reduce excessive risk-taking, while Adams and Funk (2012) argue that women prioritize social, ethical, and compliance values, collectively improving governance quality.

However, the literature also warns of tokenism (Kanter, 1977), where a small number of female board members play symbolic rather than substantive roles. Terjesen et al. (2009) emphasize the

need for a critical mass—typically at least three women—for their contributions to be fully realized.

H_2: Female commissioners positively influence firm financial performance.

2.3. Sectoral Differences: Banking vs. Non-Banking Institutions

According to contingency theory, the effectiveness of boards depends on the external environment in which firms operate (Donaldson, 2001). Banking institutions are highly regulated and exposed to greater risk, suggesting that gender diversity is more likely to have a significant impact. Pathan and Faff (2013) show that board structures are strongly linked to banks' risk profiles and profitability, while Gulamhussen and Santa (2015) confirm that female representation in banks is associated with superior performance.

By contrast, the effects of gender diversity in non-banking institutions are less consistent. Both Post and Byron (2014) and Nadeem et al. (2019) observe that female board members contribute less significantly in non-banking sectors.

H_3: The positive effects of female directors and commissioners on financial performance are stronger in the banking sector than in the non-banking sector.

2.4. Macroeconomic Factors as Moderators

Beyond firm-level governance, macroeconomic dynamics also shape the gender diversity–performance relationship. Nguyen and Vo (2020) show that female directors improve investment efficiency, particularly when firms face economic pressure. Similarly, Terjesen et al. (2016) highlight that women's contributions to boards become more pronounced under uncertain external conditions.

Economic growth (GDP) is expected to strengthen the positive effects of gender diversity, as expansion opportunities widen. In contrast, interest rate changes may create divergent moderating effects: higher rates typically harm non-banking firms through increased financing costs, but benefit banks by widening interest margins (Bayar, 2019; Sedláček and Němec, 2018). Hence, macroeconomic factors act as moderators that shape both the direction and magnitude of gender diversity's influence on financial performance.

H_{4a}: Economic growth (GDP) strengthens the positive effects of female directors and commissioners on financial performance.

H_{4b}: Interest rates moderate the relationship between gender diversity and financial performance, positively in banking and negatively in non-banking institutions.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study adopts a quantitative, causal-comparative design to examine the influence of board gender composition specifically the number of male and female directors and commissioners on firms' financial performance. Gross domestic product (GDP) and interest rates are incorporated as moderating variables. Such a design is widely applied in corporate governance studies to test causal relationships using panel data (Gujarati and Porter, 2009; Hair et al., 2014).

3.2. Population and Sampling

The population consists of all financial sector companies listed on the Indonesia Stock Exchange (IDX) during 2018–2023. A purposive sampling approach was applied based on the following criteria:

1. Companies must be listed on the IDX throughout the observation period (2018–2023)
2. Availability of complete annual reports, including information on board of directors and commissioners
3. Availability of financial data required to calculate return on equity (ROE)
4. Exclusion of firms with extreme or missing data that may bias the analysis.

This sampling strategy is consistent with corporate governance research, where reporting consistency and information disclosure are critical requirements (Aiken and West, 1991; Yermack, 1996).

3.3. Operational Definitions and Variable Measurement

All variables were operationalized based on established academic references to ensure validity and replicability (Table 1).

3.4. Data Analysis Techniques

The analysis employed multiple regression models. To assess the moderating effects of GDP and interest rates, the study used Moderated Regression Analysis (MRA), as recommended by Aiken and West (1991), and widely applied in corporate governance studies (Hamad and Cek, 2023).

Prior to estimation, data were subjected to descriptive statistics, model selection tests, classical assumption checks, robustness tests, and instrumental validity assessments. All analyses were conducted using Stata, a common tool for panel data research (Vijayamohanan, 2016).

3.5. Model Specification

The relationship between gender composition and financial performance is specified as follows:

$$ROE = \beta_0 + \beta_1 Fem\_Dir_{it} + \beta_2 Fem\_Com_{it} + \varepsilon_{it}$$

$$ROE = \beta_0 + \beta_1 Fem\_Dir_{it} + \beta_2 Male\_Dir_{it} + \beta_3 Fem\_Com_{it} + \beta_4 Male\_Com_{it} + \varepsilon_{it}$$

$$ROE = \beta_0 + \beta_1 Fem\_Dir_{it} + \beta_2 Male\_Dir_{it} + \beta_3 Fem\_Com_{it} + \beta_4 Male\_Com_{it} + \beta_5 Asset.Growth_{it} + \beta_6 DER_{it} + \beta_7 GDP_{it} + \beta_8 INT.Rate_{it} + \varepsilon_{it}$$

$$ROE = \beta_0 + \beta_1 Fem\_Dir_{it} + \beta_2 Male\_Dir_{it} + \beta_3 Fem\_Com_{it} + \beta_4 Male\_Com_{it} + \beta_5 Asset.Growth_{it} + \beta_6 DER_{it} + \beta_7 GDP_{it} + \beta_8 (GDP.$$

$fem\_com)_{it} + \beta_9 (GDP.male\_com)_{it} + \beta_{10} (GDP.fem\_dir)_{it} + \beta_{11} (GDP.male\_dir)_{it} + \beta_{12} INT.Rate_{it} + \beta_{13} (INT.fem\_dir)_{it} + \beta_{14} (INT.male\_dir)_{it} + \beta_{15} (INT.fem\_com)_{it} + \beta_{16} (INT.male\_com)_{it} + \varepsilon_{it}$

4. RESULTS

4.1. Descriptive Analysis

Table 2 presents the descriptive statistics of the key variables for financial sector firms in Indonesia during 2018–2023.

The descriptive results reveal substantial heterogeneity across firms. The average financial performance, measured by ROE, is 2.56% with a wide dispersion (SD = 16.1%), ranging from –134% to 69%, reflecting sharp profitability differences across firms.

Board structures exhibit strong gender imbalance. Female commissioners average 0.54 members per firm, with many firms having none, while male commissioners average 3.54. Similarly, female directors average 0.91 compared to 4.09 male directors, indicating persistent male dominance in executive decision-making.

Control variables also show wide variation: asset growth ranges from –1.0% to 4.65%, while leverage (DER) varies from very low to extremely high, with an average of 310%. Macroeconomic indicators remain relatively stable, particularly interest rates (4–6%), suggesting that sectoral rather than aggregate dynamics may better capture the moderating effects.

4.2. Correlation Analysis

Pearson correlation analysis was conducted to examine linear associations among variables prior to regression (Table 3). Results show that ROE is positively and significantly correlated with female commissioners ($r = 0.150$, $P < 0.01$), female directors ($r = 0.109$, $P < 0.05$), and male directors ($r = 0.154$, $P < 0.01$). This suggests that both female and male board members are associated with higher performance, although the correlation is stronger for male directors.

Further, firms with female commissioners are also more likely to appoint female directors ($r = 0.167$, $P < 0.01$), reflecting inclusivity tendencies. However, high correlations among male directors and commissioners ($r = 0.708$, $P < 0.01$) reveal structural male dominance. Asset growth correlates positively with ROE ($r = 0.146$, $P < 0.01$), while DER shows no significant correlation. GDP and interest rates display weak or insignificant direct correlations with ROE, though GDP is negatively correlated with leverage, suggesting that economic expansion reduces firms' debt dependence.

4.3. Model Selection and Validity Tests

Model selection tests were conducted to determine the most appropriate panel regression specification. The Chow Test supported the fixed-effect model (FEM) over the common-effect model ($P = 0.0000$). However, the Hausman Test favored the random-effect model (REM) over FEM ($P = 0.2968$). The Lagrange Multiplier Test further confirmed that REM was superior ($P = 0.0000$). Accordingly, REM was employed for the main regression analysis.

Diagnostic checks indicate no multicollinearity, with all variance inflation factor (VIF) values below the threshold of 10. The Arellano–Bond test confirmed no autocorrelation, while the Sargan test validated instrument reliability ($P = 0.3000 > 0.05$).

4.4. Regression Analysis

Regression results without moderation (Table 4) show that female commissioners exert a significant positive effect on ROE, although the magnitude weakens when control variables

Table 1: Variable operationalization

Variable type	Variable	Definition	Source
Dependent	ROE	Net income divided by total equity	Financial statements
Moderator	GDP	Indonesia's annual GDP (in trillion IDR)	Statistics Indonesia (BPS)
Moderator	INT_rate	Bank Indonesia's benchmark interest rate	Bank Indonesia
Independent	Male_Dir	Number of male directors	Financial statements
Independent	Fem_Dir	Number of female directors	Financial statements
Independent	Male_Com	Number of male commissioners	Financial statements
Independent	Fem_Com	Number of female commissioners	Financial statements
Control	Asset.Growth	Annual growth of total assets	Financial statements
Control	DER	Total debt divided by total equity	Financial statements

Table 2: Descriptive statistics

Variables	n	Minimum	Maximum	Mean	Standard deviation
ROE	548	−1.34	0.69	0.0256	0.16128
Fem_Com	548	0.00	4.00	0.5420	0.67066
Male_Com	548	0.00	11.00	3.5383	1.91892
Fem_Dir	548	0.00	6.00	0.9106	1.03558
Male_Dir	548	0.00	12.00	4.0858	2.25072
AssetGrowth (%)	548	−1.00	4.65	0.1102	0.40401
DER	548	−1.41	16.08	3.1031	2.97423
GDP (Trillion IDR)	548	14837.40	20892.40	17445.3330	2251.56853
INT.Rate	548	0.04	0.06	0.0513	0.00918

Table 3: Pearson correlation

Variables	ROE	Fem_Com	Male_Com	Fem_Dir	Male_Dir	Asset_ Growth	DER	GDP	INT. Rate
ROE	1								
Fem_Com	0.150**	1							
	0.000								
Male_Com	0.101*	−0.064	1						
	0.018	0.136							
Fem_Dir	0.109*	0.167**	0.341**	1					
	0.011	0.000	0.000						
Male_Dir	0.154**	0.161**	0.708**	0.115**	1				
	0.000	0.000	0.000	0.007					
Asset.Growth	0.146**	0.084	−0.025	0.066	0.031	1			
	0.001	0.051	0.558	0.123	0.473				
DER	−0.032	0.046	0.358**	0.227**	0.455**	0.012	1		
	0.458	0.287	0.000	0.000	0.000	0.772			
GDP	0.030	−0.019	−0.031	−0.003	0.007	0.023	−0.128**	1	
	0.479	0.649	0.469	0.945	0.872	0.586	0.003		
INT.Rate	−0.001	0.001	−0.003	−0.034	−0.001	−0.055	0.007	0.522**	1
	0.986	0.976	0.936	0.433	0.979	0.203	0.869	0.000	

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed)

Table 4: Regression analysis

Variables	(1)	(2)	(3)	(4)
	roe	roe	roe	roe
fem_com	0.029**	0.025*	0.022*	−2.891
	(2.52)	(1.95)	(1.86)	(−0.73)
male_com		−0.001	0.000	0.197
		(−0.11)	(0.03)	(0.11)
fem_dir	0.009	0.009	0.011	0.794
	(1.08)	(0.92)	(1.06)	(0.36)
male_dir		0.010**	0.014**	0.053
		(1.97)	(2.44)	(0.04)
assetgrowth			0.059**	0.064**
			(1.96)	(2.18)
der			−0.010**	−0.010*
			(−1.98)	(−1.90)
gdp			−0.019	0.002
			(−0.27)	(0.01)
gdpfem_com				0.079
				(0.74)
gdpmale_com				−0.004
				(−0.09)
gdpfem_dir				−0.022
				(−0.37)
gdpmale_dir				−0.002
				(−0.07)
int_rate			0.348	−2.391*
			(0.39)	(−1.78)
intfem_com				−0.989
				(−0.85)
intmale_com				−0.677
				(−0.99)
intfem_dir				1.029*
				(1.70)
intmale_dir				1.072*
				(1.95)
_cons	−0.065	−0.079	0.584	−0.053
	(−1.63)	(−1.54)	(0.23)	(−0.01)
Industry RE	Yes	Yes	Yes	Yes
r2				
r2_a				
N	548	548	548	548

t statistics in parentheses. *P<0.1, **P<0.05, ***P<0.01

Table 5: Regression analysis in the banking sector

Variables	(1)	(2)	(3)	(4)
	roe	roe	roe	roe
fem_com	0.031*	0.025*	0.024*	−0.695
	(1.80)	(1.70)	(1.69)	(−0.25)
male_com		−0.004	−0.005	2.516
		(−0.59)	(−0.74)	(1.27)
fem_dir	0.015**	0.019**	0.020**	−0.990
	(2.02)	(2.10)	(2.28)	(−0.37)
male_dir		0.012**	0.014***	−0.816
		(2.39)	(2.62)	(−0.94)
assetgrowth			0.027	0.025
			(1.35)	(1.17)
der			−0.003	−0.002
			(−0.62)	(−0.49)
gdp			−0.026	0.122
			(−0.36)	(0.97)
gdpfem_com				0.020
				(0.27)
gdpmale_com				−0.069
				(−1.29)
gdpfem_dir				0.027
				(0.37)
gdpmale_dir				0.023
				(0.98)
int_rate			2.731**	0.486
			(2.02)	(0.24)
intfem_com				−0.706
				(−0.74)
intmale_com				0.821
				(1.38)
intfem_dir				0.144
				(0.33)
intmale_dir				−0.228
				(−0.55)
_cons	−0.018	−0.069***	0.761	−4.656
	(−0.78)	(−3.11)	(0.29)	(−1.00)
Industry RE	Yes	Yes	Yes	Yes
r2				
r2_a				
N	253	253	253	253

t statistics in parentheses. *P<0.1, **P<0.05, ***P<0.01

Table 6: Results of regression analysis in the non-banking sector

Variables	(1)	(2)	(3)	(4)
	roe	roe	roe	roe
fem_com	0.030*	0.025	0.022	−5.695
	(1.81)	(1.19)	(1.01)	(−0.71)
male_com		−0.000	0.004	−2.307
		(−0.03)	(0.27)	(−1.00)
fem_dir	−0.003	0.008	0.017	4.074
	(−0.15)	(0.40)	(0.86)	(1.03)
male_dir		0.028***	0.031**	0.724
		(2.67)	(2.46)	(0.21)
assetgrowth			0.132**	0.134***
			(2.36)	(2.58)
der			−0.018	−0.017
			(−1.18)	(−1.09)
gdp			0.023	−0.114
			(0.19)	(−0.42)
gdpfem_com				0.155
				(0.72)
gdpmale_com				0.064
				(1.02)
gdpfem_dir				−0.111
				(−1.04)
gdpmale_dir				−0.020
				(−0.22)
int_rate			−1.916*	−2.207
			(−1.65)	(−1.08)
intfem_com				−1.506
				(−0.71)
intmale_com				−1.478
				(−1.21)
intfem_dir				2.018*
				(1.65)
intmale_dir				1.382
				(1.10)
_cons	−0.070*	−0.123*	−0.907	4.250
	(−1.74)	(−1.74)	(−0.20)	(0.42)
Industry RE	Yes	Yes	Yes	Yes
r2				
r2_a				
N	295	295	295	295

t statistics in parentheses. *P<0.1, **P<0.05, ***P<0.01

are included. Female directors are not significant, while male directors exhibit a strong positive effect. Asset growth contributes positively to ROE, whereas leverage (DER) negatively affects performance.

When macroeconomic moderators are introduced, GDP remains insignificant, but interest rates play a key role. Higher interest rates show a weak positive interaction with both female and male directors, suggesting that monetary stability is more relevant than aggregate economic growth in shaping the gender diversity–performance relationship.

4.5. Sectoral Analysis: Banking versus Non-Banking

To capture potential heterogeneity across industries, additional regressions were conducted by separating banking and non-banking financial institutions. The results highlight notable sectoral contrasts that reinforce the contextual nature of gender diversity effects.

4.5.1. Banking sector (Table 5)

Female directors exhibit a consistently positive and significant influence on ROE ($\beta \approx 0.015–0.020$; $P < 0.05$). This finding supports resource dependence theory, which suggests that diverse executive teams provide broader perspectives and access to critical resources (Hillman et al., 2009). In the highly regulated and risk-sensitive banking industry, decision-making requires prudence, compliance awareness, and stakeholder responsiveness—attributes often associated with female leadership (Liu et al., 2014). The evidence indicates that female executives enhance banks' strategic capabilities, particularly in navigating regulatory complexities and managing financial risks.

Female commissioners also retain their significance after the inclusion of control and moderating variables, underscoring their substantive monitoring role. This result aligns with agency theory, where effective oversight reduces managerial opportunism and strengthens governance quality (Carter et al., 2010). The persistence of their effect suggests that female commissioners in banks are not merely symbolic appointments but actively shape supervisory practices.

Macroeconomic conditions further strengthen these patterns. Interest rates positively influence banking profitability, consistent with the mechanism of net interest margin expansion. However, the interaction terms between interest rates and gender diversity variables are not significant, indicating that macroeconomic shocks affect bank profitability structurally rather than through board gender composition. In other words, while women on boards contribute substantively to banking performance, their effects are not amplified or diminished by monetary conditions.

4.5.2. Non-banking sector (Table 6)

In contrast, the non-banking sector presents a markedly different dynamic. Female directors do not exhibit significant effects on ROE; in some models, coefficients are even negative. This suggests that women in executive positions outside the banking industry may face structural barriers or limited influence over strategic decision-making. Such patterns may reflect institutional bias, sectoral diversity, or insufficient critical mass, as emphasized by tokenism theory (Kanter, 1977).

Male directors, however, consistently demonstrate significant positive effects on performance, indicating that traditional male-dominated networks and experience remain central drivers of success in non-banking firms. Similarly, the influence of female commissioners is initially significant but disappears once firm-level controls and macroeconomic moderators are introduced. This diminishing effect highlights their limited substantive role in non-banking governance structures, reinforcing the argument that female commissioners may serve more as legitimacy symbols than as active monitors (Terjesen et al., 2009).

The role of macroeconomic factors diverges sharply from the banking sector. Interest rates exhibit a significant negative effect on ROE ($\beta \approx -1.916$; $P < 0.1$), reflecting the sector's sensitivity to financing costs. Unlike banks that benefit from higher rates,

non-banking institutions suffer from rising borrowing costs, which directly reduce profitability. Interestingly, the interaction between interest rates and female directors is weakly positive ($\beta \approx 2.018$; $P < 0.1$). This suggests that female executives may play adaptive roles under external shocks by pursuing efficiency-oriented strategies, diversifying financing, or adopting risk-averse investment policies. This finding echoes contingency theory, which emphasizes that leadership effectiveness depends on environmental conditions (Donaldson, 2001).

5. DISCUSSION

The findings of this study provide nuanced insights into how board gender diversity influences firm performance in Indonesia's financial sector. They demonstrate that gender effects are not uniform but contingent upon board functions, industry sectors, and macroeconomic conditions. This discussion interprets the results in light of established theories and prior evidence while drawing practical implications.

First, the role of female directors differs sharply across sectors**.** In the banking sector, female directors exert a significant positive impact on ROE, consistent with resource dependence theory. Their presence broadens managerial perspectives, introduces more cautious and ethical approaches, and strengthens firms' ability to navigate complex regulatory and risk-intensive environments. This aligns with evidence from Liu et al. (2014) in China and Ouni et al. (2022) in Tunisia, both of which emphasize the strategic value of female executives in contexts requiring heightened compliance and prudence. In contrast, female directors in non-banking institutions fail to demonstrate significant effects, suggesting that institutional barriers, limited authority, or sectoral heterogeneity reduce their substantive influence. This divergence underscores that female executives' contributions depend on the alignment between organizational demands and leadership attributes.

Second, female commissioners play a substantive role in banks but a symbolic one in non-banks. Their positive and significant effect on bank performance confirms agency theory, as enhanced monitoring reduces managerial opportunism and strengthens governance quality (Carter et al., 2010). However, in non-banking firms, their influence dissipates once controls and moderators are introduced, indicating tokenism (Kanter, 1977). This finding echoes concerns that without critical mass or substantive authority, female commissioners may serve more as legitimacy figures than as active monitors (Terjesen et al., 2009). Such contrasts highlight the importance of differentiating board functions when assessing gender effects, particularly in two-tier governance systems like Indonesia's.

Third, male directors continue to dominate performance outcomes across both sectors. Their consistent positive effects reinforce the persistence of structural male dominance in corporate leadership, reflecting path dependence and institutional inertia. Institutional theory suggests that entrenched cultural norms and business practices reinforce the perception that men are more capable leaders, thereby sustaining their dominance despite growing evidence of the benefits of gender diversity. This dominance is particularly pronounced in non-banking institutions, where male experience and networks remain decisive.

Fourth, macroeconomic conditions reveal critical sectoral distinctions. GDP, though widely recognized as a growth indicator, shows no moderating role in the gender diversity–performance relationship. This suggests that aggregate economic expansion alone does not alter board dynamics in financial institutions. In contrast, interest rates prove decisive, exerting opposite effects across sectors: they enhance bank profitability through net interest margin expansion but reduce non-bank profitability by raising financing costs. This duality reflects the logic of contingency theory, which emphasizes that board effectiveness is shaped by external environments (Donaldson, 2001). Notably, in non-banking firms, the weakly positive interaction between female directors and interest rates suggests that women may adopt adaptive strategies under financial pressure, potentially mitigating the adverse effects of higher borrowing costs. Such resilience resonates with studies emphasizing women's risk-averse yet innovative approaches during crises (Jiang et al., 2021; Nguyen et al., 2020).

6. CONCLUSION AND IMPLICATIONS

This study examined the impact of board gender diversity on the financial performance of Indonesian financial institutions, distinguishing between directors and commissioners and comparing banking and non-banking sectors, with GDP and interest rates as moderating factors.

The findings reveal three main conclusions. First, female directors significantly enhance financial performance in the banking sector but not in non-banking institutions, underscoring the importance of sectoral context. Second, female commissioners play a substantive supervisory role in banks but a largely symbolic role in non-banks, highlighting the need to distinguish board functions in two-tier governance systems. Third, macroeconomic conditions, particularly interest rates, strongly shape outcomes: they benefit banks while harming non-banks, with female directors in non-banks showing some adaptive resilience under adverse monetary conditions.

Theoretically, the study contributes to agency, resource dependence, and contingency theories by demonstrating that gender diversity's effects are contingent on board functions, sectoral contexts, and external environments. It also enriches emerging-market evidence, where institutional structures and gender norms differ from those in developed economies.

Practically, the results have several implications. For regulators such as OJK and IDX, policies promoting female leadership should be sector-specific: banking appears to benefit most from female participation, while non-banking requires strategies that empower women beyond symbolic inclusion. For firms, placing women in roles with real decision-making authority is essential to unlocking performance benefits. For investors, female commissioners in banks may serve as governance quality signals, while in non-banks, closer scrutiny is required to ensure substantive contributions. For policymakers, the stronger role of interest rates relative to GDP

highlights the need for monetary policy that accounts for sectoral sensitivities.

Overall, gender diversity in corporate boards is not a universal solution but a contextual factor whose effectiveness depends on governance roles, industry characteristics, and macroeconomic conditions. Future research should extend the analysis to longer periods, alternative performance measures, mediating mechanisms such as risk management or disclosure quality, and comparative studies across ASEAN countries to further explore institutional and cultural influences.

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