



## Article

# Is the Nexus between Gender Diversity and Firm Financial Distress Moderated by CEO Duality?

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**Abstract:** This study examines the impact of gender diversity in the positions of board commissioners, executive directors, and audit committee members on the financial performance of firms experiencing financial trouble. It also evaluates whether the presence of a CEO with multiple responsibilities moderates this relationship. The analysis encompassed 224 publicly traded companies from the non-financial sector, spanning the years 2012 to 2021. The study employed the dynamic panel model system GMM to address issues of endogeneity, simultaneity, and heterogeneity in the data. The findings indicate that the presence of women on supervisory boards and in senior positions has a substantial impact. Companies with a higher number of female board members have reduced financial hardship among Malaysian listed enterprises. Female directors exhibit a greater level of caution and risk aversion while participating in management choices, which is a significant conclusion. Research indicates that the majority of financial variables are inherently endogenous, so dynamic models are better suited for analyzing the interaction between these variables. This study also presents the notable correlation between gender diversity on boards of management, CEO duality, and financial difficulty.

**Keywords:** corporate governance; CEO duality; financial distress; gender diversity; financial performance; dynamic panel model



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## 1. Introduction

The term “gender” is distinct from the concepts of biological sex in finance or management perspectives. This study, for instance, focuses on the commercial dimension. Examining the interactions between behavior, role, and appearance in the context of problem-solving and decision-making processes pertaining to organizational performance will also broaden the scope of this study. According to Ruisah and Kom (2018), gender is a cultural construct employed to differentiate societal duties, behaviors, mindsets, and emotional attributes between males and females. The presence of diverse board structures is primarily indicative of the genuine essence of efficient corporate governance processes (Li et al. 2020). Due to the global financial crisis and cases of corporate financial misconduct, more research is looking into how important a skilled board is for lowering the risk of financial trouble in companies (Younas et al. 2021). According to Jo and Harjoto (2011), in a theoretical sense, formulating corporate transparency rules, devising management strategies, and actively participating in endeavors that promote ethical conduct are the main responsibilities of the director on the board of any firm. Furthermore, the director

serves to mitigate agency concerns by effectively regulating executive authority and curbing self-interested conduct. Board diversity facilitates the generation of a greater number of ideas, expanding the range of possibilities available for making good decisions. Consequently, variations in the attributes of individuals can enhance the process of decision making (Jebran et al. 2020).

The current study is an extension of the research of Ali et al. (2023), which also established an association between diversity on the board and the likelihood of FDI in Chinese listed firms. Still, there are direct links reported about how board diversity affects FD, but the modulating effect is not yet considered. Previous studies produced inconsistent findings (Lee and Thong 2022). Several studies suggest that gender diversity on business boards reduces bankruptcy risk (Guizani and Abdalkrim 2022; Lee and Thong 2022). Some studies have found no link between female directors and financial problems. The commissioner board, board of directors, and audit committee boards are considered to have diversity for this study. García et al. (2021) concentrated on industrialized and developed economies. This study uses a developing economy to provide empirical evidence.

A study by the Harvard Business Review found that investors were less likely to invest in companies with all-male boards, citing concerns about the lack of diversity and its potential impact on financial performance (Bernile et al. 2018). Wells Fargo faced significant financial challenges in 2019, including a \$3 billion settlement with the U.S. Department of Justice and the Securities and Exchange Commission. At the time, Cowley (2019) cited the predominantly male makeup of the bank's board of directors as a contributing factor to the company's inability to effectively address the issues and regain stakeholder trust. In 2018, General Electric (GE) experienced a significant financial crisis, leading to a \$22 billion write-down and the replacement of its CEO. Critics criticized the company's all-male board for failing to challenge prevailing strategies and identify emerging risks, ultimately contributing to the company's financial distress (Gryta and Lublin 2018). In 2020, Wirecard, a German payment processing company, collapsed amid allegations of fraud and accounting irregularities. Critics criticized the all-male supervisory board for its lack of independent oversight and failure to detect the issues, which ultimately led to the company's financial downfall (Teichmann et al. 2023). In 2017, Uber faced a series of scandals and financial challenges, including the resignation of its CEO and a significant decline in its market valuation. Griffith (2017) cited the company's lack of gender diversity on its board as a factor that limited its ability to navigate the crisis and identify new growth opportunities.

BODs and top executives' dynamic interaction influences company decisions, according to Boyd et al. (2011). The CEO's and BOD's power distribution affects the board's monitoring role. Tang et al. (2011) suggest that boards with more power than CEOs may reduce CEO risk-taking behavior. However, the idea of managerial discretion shows that powerful CEOs may affect business decision-making (Schopohl et al. 2021). Board members that are close to the CEO are often appointed as internal or external executive directors. Insufficient board monitoring permits CEOs to utilize corporate resources for personal gain, resulting in financial losses (Park et al. 2018). Muttakin et al. (2018) found that even diverse board members rarely question prominent CEOs (Usman et al. 2018). Previous studies reported that CEOs have more influence and dominance in organizations with female directors, suggesting that gender-diverse boards are unable to work independently and are less likely to constrain CEO authority. The results will show that CEO duality, or having a CEO as both CEO and board chair, influences the relationship between board diversity and financial distress. The current study questions the effect of gender diversity on financial distress and the outcomes if there is duality on the board.

To improve company governance, we need to implement company governance codes that incorporate best practices. Thus, a thorough study of the effects of board diversity is valuable for advising regulatory agencies. Gender diversity may reduce financial distress in Malaysia, although previous research has not considered this. This study contributes to the examination of the relationship between financial distress and diversity on different boards

of the firm, while also examining the modulating role of the CEO duality structure on the board. This is in contrast to previous research, which solely focused on gender as a predictor of financial distress. The empirical literature has also shown a clear association in different ways, such as gender, age, and FDI (Manzaneque and Priego 2016). When CEO duality is absent, diversity helps to mitigate financial crises. The results support agency theory because they show that boards with varied types of members may monitor and manage CEOs' potentially self-serving decisions, reducing the danger of financial distress (FD). This study is helpful for listed firms to make better policies and their implications actionable.

## 2. Literature Part of the Study

### 2.1. Board Diversity and Financial Distress

The BOD has a significant role to play in increasing the share value, generating profits, and safeguarding the interests of all the stakeholders. Generally, total diversity on the board improves monitoring functions. Bhaskar et al. (2017) reported a significant positive effect of having no diversity on corporate boards on financial distress, which means that it helps in increasing the problem of financial distress. Agency theory and resource dependency theory both explain the relationship between board diversity and FDI. Post and Byron (2015) argued that agency theory is in favor of diverse boards and suggested their positive impact on corporate boards. Adams and Ferreira (2009) argued that gender diversity has emerged as a critical issue in the corporate world, with growing attention to the potential impact of gender representation on various business outcomes. Numerous studies have examined the relationship between board gender diversity and firm performance, yielding mixed results. Some research suggests that greater gender diversity on corporate boards can enhance financial performance, while other studies have found no significant impact or even a negative effect (Farooq et al. 2024). While resource dependence theory suggests that a board's experiences, talents, education, and background may help them acquire necessary resources, Therefore, a substantial level of diversity restricts the extent of individual managerial autonomy and exerts a considerable impact on the strategic choices made by the organization. Furthermore, a board with a high level of diversity fosters an environment that promotes innovation and a willingness to consider novel and effective ideas during board meetings, thereby enhancing the quality of the decision-making process. Therefore, the presence of diverse boards can potentially influence the likelihood of a firm's financial distress by mitigating firm risk. Furthermore, research has shown that diverse boards enhance investment decisions and boost overall firm performance (Ullah et al. 2020).

Previous studies on the link between diversity and financial distress had mixed results in different regions due to different setups and structures. Freitas Cardoso et al. (2019) found no significant link between these factors, but some found a negative association, such as Kristanti et al. (2016), while several studies found a positive link, and a U-shaped association is also reported in the same case (Ullah et al. 2020). Most of the studies focused on the different characteristics of gender, such as age, ethnicity, region, education, and experience. Recent research by Yousaf et al. (2021) examined how board diversity indices predict FDI, focusing on demographic and cognitive characteristics.

### 2.2. Effect of Existence of Female Director on Financial Distress

Governance organizations eagerly await strong governance. The board of commissioners oversees and advises directors on company management using the firm's goals, which include GCG obligations. This helps directors manage firm operations. We use social identity theory to explore the relationship between governance, FDI, and gender. This study uses social identity theory to explore social identity, which includes personal and societal aspects, shared traits, and distinctive traits that distinguish individuals. Social identity is a person's view, ethnicity, and identity of them as a group member of specific culture. This theory states that BODs, directors on commissioner's boards, and audit committees interact with company management to promote organizational progress. Inclusion of

women boosts ROA and financial performance in a variety of ways. Gyapong et al. (2016) found that compliance with MCCG with 30% females on boards increases corporate and share value due to the trust of shareholders and creditors. The board of directors may have different opinions about an event. Moreover, commissioner influence on corporate management's board boosts confidence.

Female directors may impact decision-making (Khan et al. 2021). The audit committee assists commissioners in monitoring, examining, and assessing organization performance. The board, audit committees, and commissioners' characteristics affect their decisions. Men and women have different skill sets, according to Friedman (1996). According to psychology, men are bold and take on a lot, especially in leadership. They make risky decisions. Women are more detail-oriented and aware of nonverbal clues. Qian (2017) found that women in leadership roles perform better. This symbiotic relationship between behavior and performance style improves performance when under the board's oversight. Due to their inclusive approach, which generates multiple perspectives, Hillman (2007) says women can promote successful communication in decisionmaking.

Zhou (2019) found that organizations with female directors make investment decisions differently, which affects financial performance. Female filmmakers are more cautious and conservative than male directors, who are more confident. Investors are pleased to have female directors because they think they can help the company overcome challenges. The increased presence of women can boost reputations and make a positive contribution. Tamres et al. (2002) also found that women are more introspective and anxious than men. Nolen-Hoeksema (2012) found that women are more emotionally distressed. There is evidence that companies with women experience fewer financial difficulties. Experimentally, Stoet et al. (2013) found that pressure improves women's organizing skills. The researchers explained that women tend to stay silent and contemplate stressful and complex events, while men transition between activities more slowly and with less structure. Human integration in the firm can also help build a simple approach by fostering positive attitudes and professional conduct.

Gender diversity in corporate governance systems indicates a preference for diversified human resources. Davis et al. (2010) found that different genders develop different work values and strategic decision-making behaviors due to societal expectations. Because women sometimes emphasize profitability, gender diversity affects market orientation and performance. Women are distinctive; hence, they have different skills than men (Terjesen et al. 2009). Thus, diversity expands decision-making choices. Women in corporate environments can boost their reputations. Equal female representation in organizations fosters innovation. This study hypothesizes that organizations with female directors are less likely to experience financial difficulties. Therefore, the current study established the hypothesis that female directors in firms in top positions negatively affect financial distress, as follows:

- H1.** *Women on commissioner boards is significantly associated with financial distress.*
- H2.** *Women on executive boards is significantly associated with financial distress.*
- H3.** *Women on boards of audit committees is significantly associated with financial distress.*

### 2.3. Moderating Role of CEO Duality

The CEO's authority and control over various operations within their companies have a significant impact on performance, as well as the independence and monitoring functions of directors. They collaborate with directors on resource allocation and strategic decision making. Agency theory states that senior executives' self-interests impact organizational decision making, resulting in agency costs (Jensen and Meckling 1976). Upper-level management prioritizes self-interest over owner interests, according to Weisbach (1988). Thus, influential CEOs favor activities that benefit themselves, lowering share value (Ntim et al. 2017). Individuals can make poor investing and financial decisions, causing firms financial difficulty (Athari 2023). However, diversity on the board facilitates excellent

decision making, protects ownership interests, and increases business value. According to [Anderson et al. \(2011\)](#), CEO duality moderates the relationship between board diversity and corporate value, making it more effective. If there is a duality structure on the board, then the CEO might be biased and exercise favoritism while appointing external and internal executive directors on the board, which is a very common practice in Asian countries, and the decisions of the CEO will never be questioned by the board of directors ([Zhong et al. 2021](#)). The study also revealed that these directors tend to endorse the CEO's actions. Thus, prominent CEOs may significantly influence resource distribution, finances, and the impact of board diversity on financial crisis risk. Diverse board members protect shareholder interests and monitor the CEO's self-interested behavior while serving the firm as well ([Brennan et al. 2008](#)). CEO risks can be mitigated by having diverse board members with various demographics and traits. [Jensen and Meckling \(1976\)](#) found that CEOs with more autonomy and responsibility might hide their blunders and put their own interests ahead of shareholders'. This study supports the management discretion hypothesis that more CEO discretion leads to poor governance and financial crises. The current study proposes that CEO duality on the board of directors moderates the association.

**H4.** *In the presence of CEO duality, the relationship between women on the various boards and financial distress will be stronger.*

### 3. Materials and Methods

#### 3.1. Sample Selection and Data

The present study utilizes data obtained from non-financial enterprises on the Malaysian Stock Exchange (KLSE). The collection of data from 2012 to 2021 was facilitated through the utilization of the CMDB database. This study commenced in 2012, as it aligns with the revision of corporate governance regulations by the MCCG. Based on the availability of published data from these firms, we included a total of 260 listed firms in the sample. However, we found that only 238 of these listed firms had complete data. Out of the 238 firms listed, there are certain firms that have not provided statistical data pertaining to female board members. Hence, the final sample of the study comprised just 224 listed firms. Furthermore, the analysis excluded financial organizations due to their unique disclosure and capital structure requirements.

#### 3.2. Variables of the Study

The current study encompassed the variation in gender representation inside the organizational framework, specifically examining the presence of both women and men. This study considered the data of female directors serving as audit committee members, commissioners, and directors on the board as crucial components in the establishment and advancement of the firm. The independent variable in this analysis is gender diversity, whereas the financial distress likelihood is taken as the dependent variable. In the dependent variable, we used the Z-score technique to represent financial distress, specifically as FD measures. According to the study by [Olengga and Fauzi \(2020\)](#), Z-scores produce more accurate measurements than other analytical techniques. The Z-score in current research was formulated as follows:

X1 = Working capital/total assets;

X2 = Retained earnings/total assets;

X3 = Earnings before interest and tax (EBIT)/total assets;

X4 = Market value of equity/book value of total liabilities;

X5 = Revenues/total assets.

This study employed gender diversity as a variable, encompassing three distinct forms within the framework of corporate governance: commissioners (GDC), directors (GDB), and auditors' committees (GDA). We assessed these variables using a nominal scale, assigning a value of 1 to companies with both women and men on their board, and a value of 0 to companies with no female representation and only male board members. Furthermore, this study employed control factors, a common practice in previous research



on gender diversity. This study used a dataset of non-financial, publicly traded companies. This study additionally employed control factors to mitigate their potential influence. The details of variables and their measurements are depicted in Table 1 of the study.

**Table 1.** Explanations and measurements of variables.

Variable	Symbol	Measurement	Reference
Dependent Variables			
Likelihood of Financial Distress	FDI	Altman Z_Score calculated as Z-Score = $6.56 \times (\text{Sales}/\text{TotalAssets}) + 3.26 \times (\text{Retained Earnings}/\text{Total Asset}) + 6.72 \times (\text{EBIT}/\text{Total Asset}) + 1.05 \times (\text{Book value of total Equity}/\text{Total Assets})$	Altman (2007)
Independent Variable			
Gender Diversity at Commissioner Board	GDC	Female presence on the board of commissioners	Abbas and Frihatni (2023)
Gender Diversity at Directors Board	GDB	Female presence on the board of directors	Abbas and Frihatni (2023)
Gender Diversity at Audit Committee	GDA	Female presence on the board of audit committees	Abbas and Frihatni (2023)
Moderating Variable			
CEO Duality	CEOD	Calculated as 1 if there is duality on the board and CEO is also a president or chairman and 0 otherwise	Khan et al. (2021)
Control Variables			
Firm Size	FS	Natural log of the firm's total asset	Khan et al. (2020)
Firm Leverage	LEV	Ratio of total liabilities divided by total assets	Khan et al. (2020)
Firm Liquidity	FL	Dividing current assets by current liabilities	Farooq et al. (2023)

### 3.3. Econometric Model

To investigate the associations in the current study, we employed dynamic panel data statistical models, namely the 2-step system GMM, as in previous studies, and argue that using static models such as fixed effects and random effects is biased, such as Khan et al. (2021), Abínzano et al. (2024), and Olaoye et al. (2024). The GMM model in this study mitigates the potential influence of specific firm-specific characteristics on the relationship (Shen 2024). Additionally, "it will address the reverse causality between FD and board diversity, which could be the reason for endogeneity issues that simultaneously impact the relationship" (Khan et al. 2021). We employed the forthcoming model specifications to examine our offered hypotheses in the context of listed enterprises in Malaysia. For the direct relationship, this study used the following 2-step system GMM as the dynamic panel model to control for the potential effects of dynamic endogeneity:

Model 3.3.1:

$$\begin{aligned} \text{FD}_{it} = a_0 + & a_1 \text{LFD}_{i,t-1} + \beta_1 \text{GDC}_{it} + \beta_2 \text{GDB}_{it} + \beta_3 \text{GDA}_{it} + \beta_3 \text{CEOD}_{it} \\ & + \beta_4 \text{FS}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{FL}_{it} + \beta_7 \text{Industrydummy}_{it} \\ & + \beta_8 \text{Yeardummy}_{it} + \mu_i + \eta_t + \varepsilon_{it} \end{aligned}$$

where FD at the independent variable side is refers to the effect of past financial distress on current distress, while GDB, GDC, and GDA refer to gender diversity on the commissioner board, board of directors, and audit committee board, respectively.

Model 3.3.2: Gender diversity on commissioner board and financial distress, moderated by CEO duality on the board.

$$FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDC_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} \\ + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} \\ + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$$

Model 3.3.3: Gender diversity on the directors' board and financial distress, moderated by CEO duality on the board.

$$FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDB_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} \\ + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} \\ + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$$

Model 3.3.4: Gender diversity on the audit committee board and financial distress, moderated by CEO duality on the board.

$$FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDA_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} \\ + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} \\ + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$$

### 3.4. Conceptual Framework of the Study

We built the conceptual framework for this study upon a thorough review of existing literature on gender diversity, financial distress, and CEO duality. We drew upon theoretical perspectives such as agency theory and resource dependence theory to develop a comprehensive understanding of the potential mechanisms through which gender diversity may impact financial distress. Additionally, we explored the theoretical underpinnings of CEO duality and its potential implications for the relationship between gender diversity and financial distress. By synthesizing these diverse theoretical perspectives, we aimed to develop a conceptual framework that captures the multifaceted nature of the relationship between gender diversity, financial distress, and CEO duality (Figure 1).

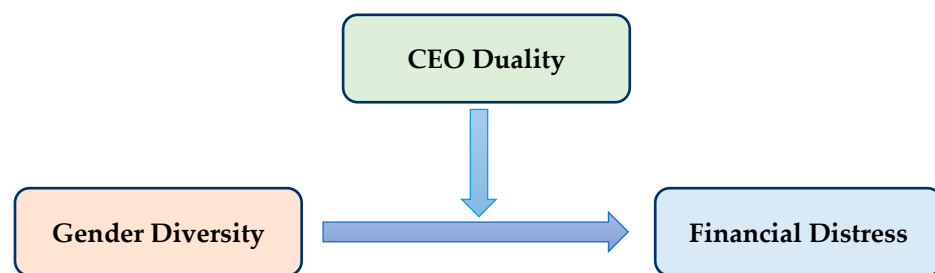


Figure 1. Conceptual framework of the study.

## 4. Results and Discussion

### 4.1. Descriptive Statistics

Table 2 presents an overview of the descriptive analysis. The average FD probability score for Malaysian listed corporations is 0.81, with a max value of 1.97 and a min value of  $-1.71$ . Based on the average valuation, the data suggest that a sizable portion of the Malaysian listed companies in our sample may be experiencing financial difficulties. The subsequent examination presents an introductory perspective on gender factors within three sectors on the board, which include the commissioner board, directors, and audit committee. The findings indicate that the mean gender diversity on the commissioner board is 12%, with a maximum value of 18% and a minimum of 0%. The representation of gender diversity on the board is characterized by a mean value of 19%, with the highest value observed at 28% and the lowest value at 0%. Within the audit committee, the representation of females in service roles amounts to a mere 15%. This figure indicates that the aggregate

score of females on the audit board ranges from 0% to a maximum of 20%. The MCCG explicitly states in its amended standards that a minimum of 30% representation is required. However, there is evidence of inadequate adherence to corporate governance codes among listed companies in Malaysia. The findings of this study indicate that Malaysia exhibits a lower level of gender diversity in comparison to other developed nations.

**Table 2.** Descriptive statistics of the study.

Variables	Symbol	Mean	Std.Dev	Min	Max
Financial distress	FD	0.81	0.78	−1.71	1.97
Gender diversity on the commissioner board	GDC	0.12	0.04	0.00	0.18
Gender diversity on the board of directors	GDB	0.19	0.14	0.00	0.28
Gender diversity on the audit committee board	GDA	0.15	0.11	0.00	0.20
CEO duality	CEOD	0.13	0.06	0.00	0.17
Firm size	FS	24.18	1.18	13.42	23.56
Firm leverage	LEV	0.49	0.21	0.13	0.80
Firm liquidity	FL	0.23	0.31	0.01	1.32

#### 4.2. Correlation Analysis

In connection with the firm’s engagement in CSR, the results show that ethnic diversity, educational-level diversity and tenure diversity are negatively linked with CSR spending, whereas reminder board diversity-related variables are directly linked with CSR. We found that the correlations between the explanatory variables of the same model are not high. Their results indicate that there is no problem with multicollinearity. Table 3 shows the correlation results for the remaining variables, which show that there is no evidence of multicollinearity in the data because the correlation coefficients between model variables are less than 0.70. As a result, there is no multicollinearity in the data.

**Table 3.** Bivariate analysis of the study.

Variables		FD	GDC	GDB	GDC	CEOD	FS	LEV	FL
Financial distress	FD	1.000							
Gender diversity (Commissioner Board)	GDC	0.114	1.000						
Gender diversity (Board of Directors)	GDB	−0.057	−0.041	1.000					
Gender diversity (Audit Committee)	GDA	−0.245	0.248	−0.029	1.000				
CEO duality	CEOD	−0.239	−0.148	0.019	−0.017	1.000			
Firm size	FS	−0.125	−0.065	0.035	0.038	0.129	1.000		
Firm leverage	LEV	−0.568	−0.068	−0.081	−0.027	−0.347	−0.368	1.000	
Firm liquidity	FL	0.149	−0.754	−0.024	−0.034	0.038	−0.156	0.027	1.000

Note: The table is derived through STATA “asdoc” command.

Furthermore, we investigated multicollinearity using the variance inflation factor (VIF). A VIF larger than 10 implies excessive multicollinearity but a VIF less than 10 is acceptable. However, according to Henseler et al. (2015) and Ullah et al. (2013), the highest level for the VIF is 5. VIF results in Table 3 demonstrate that no value is larger than 5. As a result, there is no multicollinearity between the research variables (Table 4).



**Table 4.** VIF analysis of the variables.

Variables	Symbols	VIF	1/VIF
Financial distress	GDC	1.458	0.702
Gender diversity on the commissioner board	GDB	1.226	0.746
Gender diversity on the board of directors	GDA	1.238	0.768
Gender diversity on the audit committee board	FS	1.148	0.810
CEO duality	LEV	1.153	0.901
Firm size	FL	1.164	0.910

#### 4.3. Results of Regression Analysis

This study makes use of the Generalized Method of Moments (GMM) approach that Roodman (2009) suggested, in order to reduce the potential endogeneity issue. Table 5 displays the results of the two-step Generalized Method of Moments (GMM) method used to investigate the direct link between board diversity and financial distress. The findings presented in Table 5 illustrate a positive correlation between board diversity at various stages and levels and the overall variety of the board, including demographic and cognitive diversity. These results suggest that increased board diversity is associated with a decrease in the chance of financial distress, as indicated by the financial distress score. Moreover, the  $p$ -values from the Arellano Bond (AR-2) and Hansen tests indicate that the potential issue of endogeneity has been appropriately resolved. Table 6 provides additional evidence that the influence of the CEO has a moderating role in the relationship between board diversity and the likelihood of experiencing a financial crisis. The findings shown in Table 6 provide empirical evidence supporting the notion that a board with diverse characteristics can effectively reduce the likelihood of financial difficulty, particularly when there is a strong CEO in place.

**Table 5.** Results of regression analysis.

Model-1 : $FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDC_{it} + \beta_2GDB_{it} + \beta_3GDA_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$			
Direct Relationship: Dynamic analysis between gender diversity, CEO duality, and financial distress			
Dependent Variable: Financial distress (FD)			
Variables of the Study		Coefficient	Std. Dev
Lagged dependent variable	FD (t – 1)	0.7168 **	0.1360
Gender diversity on commissioner board	GDC	−0.0131 **	0.0093
Gender diversity on board of directors	GDB	0.0114	0.1157
Gender diversity on audit committee	GDA	−0.0844	0.0254
CEO duality	CEOD	−0.2689 **	0.1401
Firm size	FS	0.0215	0.0110
Firm leverage	LEV	0.0008 *	0.0008
Firm liquidity	FL	0.0050	0.0052
Constant	C	−0.14934	0.1311
Year dummy	D		Yes
Industry dummy	D		Yes

**Table 5.** Cont.

	Standard errors	Error	Clustered
Observations		Obs	2214
Number of groups			235
Number of instruments			97
F-statistics ( <i>p</i> -value)			7561.3(0.00)
Arellano–Bond test AR(1) ( <i>p</i> -value)		ARI	−1.61 (0.021)
Arellano–BondtestforAR(2) ( <i>p</i> -value)		ARII	1.17(0.324)
Sargan testofoverid. ( <i>p</i> -value)			19.37(0.624)
Difference-in-Hansentest ( <i>p</i> -value)			0.16(0.897)

Note: In above table \* refers to significant level at 10%, \*\* at 5%.

**Table 6.** Moderating effect of CEOD on the link between gender and FDI.

Model 3.3.1 :  $FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDC_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$

Model 3.3.2 :  $FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDB_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$

Model 3.3.3 :  $FD_{it} = a_0 + a_1LFD_{i,t-1} + \beta_1GDA_{it} \times \beta_2CEOD_{it} + \beta_3CEOD_{it} + \beta_4FS_{it} + \beta_5LEV_{it} + \beta_6FL_{it} + \beta_7Industrydummy_{it} + \beta_8Yeardummy_{it} + \mu_i + \eta_t + \varepsilon_{it}$

Variable		With GDC		With GDB		With GDA	
		Coeff	Std. D	Coeff.	Std. Dev	Coefficient	Std. Dev
Lagged dependent variable (t − 1)	LFD	0.138 ***	0.0621	0.127 ***	0.0067	0.127 ***	0.0073
Diversity on commissioner board	GDC	−0.318 **	0.013				
Diversity on board of directors	GDB			−0.151	0.0177		
Diversity on audit committee	GDA					−0.345 *	0.1318
CEO duality	CEOD	−0.612 ***	0.087	−0.267	0.0442	−0.271 **	0.0917
CEOD × GDC (Moderating)		0.418 ***	0.059				
CEOD × GDB (Moderating)				1.127 ***	0.1869		
CEOD × GDA (Moderating)						0.360 ***	0.121
Firm size	FS	0.0472 ***	0.0155	0.0302 ***	0.0029	0.0498 ***	0.0022
Firm leverage	LEV	−0.9054 **	0.0508	−0.9091 **	0.0407	−0.9148 ***	0.0517
Firm liquidity	FL	0.1927 ***	0.0137	0.2484 ***	0.0141	0.2052 ***	0.1471
Constant	C	−0.161	0.1326	0.2451 **	0.1286	−0.2428	0.1212
Year dummy	D		Yes		Yes		Yes
Industry dummy	D		Yes		Yes		Yes
Standard error	Error		Clustered		Clustered		Clustered
Observations	Obs.		1238		1225		1225
Groups			232		231		231
Number of instruments			98		94		97
F-statistics ( <i>p</i> -value)			5194.0(0.00)		9249.7(0.00)		5140.1(0.00)

Table 6. Cont.

Arellano–BondtestAR(1) ( <i>p</i> -value)	ARI	1.74 (0.0298)	1.66 (0.0518)	1.48 (0.0345)
Arellano–BondtestAR(2) ( <i>p</i> -value)	ARII	1.62(0.141)	1.07(0.371)	1.01(0.274)
Sargan–Hansentest ( <i>p</i> -value)		0.77(0.780)	1.47(0.811)	1.69(0.721)
Difference-in-Hansentest ( <i>p</i> -value)		0.33(0.840)	0.54(0.722)	0.61(0.813)

Note: In above table \* refers to significant level at 10%, \*\* at 5% and \*\*\* at 1% level.

#### 4.4. Diversity, CEO Duality, and FDI

This study explains corporate governance, which includes different boards, such as commissioners' board, boards of directors, and audit committees' executive directors. The organization's governing bodies supervise the practices and structure of the business line's transition and, therefore, deal with financial and operational ownership. Some organizations can have all three traits, including gender composition, which may comprise men or women. Previous studies reported the positive impact of gender diversity on financial performance of listed firms (Dedunu and Anuradha 2020). Farooq et al. (2023) reported that companies with the standard number of women on boards perform better comparatively. The organization's financial trajectory was analyzed in this research to improve the model. The difference between distress and non-distress is the focus. This study examined how variety affects the two inclinations.

Does hiring women affect financial performance? Table 5 shows the relationship with CEO dualism, gender diversity, and financial hardship. It examines the lagged dependent variable, previous financial distress (FD ( $t - 1$ )), when used as an independent variable. Table 5 shows a substantial association and positive contribution between FD and LFD ( $b = 0.7168$ ;  $p < 0.01$ ). It means that prior FD positively influences current FD. This study found that all gender diversity indicators worsen financial stress. Importantly, the impact is statistically significant for the variable GDC ( $b = -0.0131$ ;  $p < 0.01$ ). Female directorship on the board or gender diversity on the board of commissioners significantly negatively affects financial distress.

The findings presented in this study are similar to those of Bernile et al. (2018), which suggest a negative relationship between board diversity and financial distress. Furthermore, Kristanti et al. (2016) demonstrated that female directors play a beneficial role in mitigating the chance of financial distress and other risks for enterprises by enhancing firm performance. We can attribute this finding to the common risk-averse nature among female directors. The findings indicate that there was no significant impact on financial distress when considering gender characteristics such as diversity on the board of directors (GDB) ( $b = 0.0114$ ) and gender diversity on the audit committee (GDA) ( $b = 0.0844$ ). Harjoto et al. (2018) proposed that a board characterized by a range of attributes, including tenure, experience, and educational diversity, is more effective in monitoring and decision-making processes. This, in turn, leads to improved business performance and a reduced likelihood of a financial crisis. Furthermore, the aforementioned findings provide support for the perspective held by upper-level executives that the background and skills possessed by decisionmakers in top management have an impact on the overall success of the business (Hambrick and Mason 1984).

This study strengthens the integrated resource reliance and agency principle. The results show that highly skilled directors, as board capital, improve the board's ability to oversee and provide resources and advisory services (Hillman and Dalziel 2003). The study indicated a substantial negative influence on financial distress ( $b = 0.2689$ ;  $p < 0.05$ ) related to CEO duality (CEOD) at a 5% level. CEOD and GDC are the only independent variables that significantly affect the company's financial difficulty. The role of the CEO is important due to their influence and decision-making power; results show the negative impact CEO duality, such as shown in Table 5, coefficient ( $-0.711$ ), demonstrating that CEO duality has negative influence on FDI than board diversity. The study indicated a substantial negative influence ( $b = 0.2689$ ;  $p < 0.05$ ) on financial distress when two CEOs were present at a 5%

significance level. Only the independent variables CEOD and GDC negatively affect the organization's financial difficulties statistically. The results show that the CEO has a vital role that affects the firm's policies and procedures, and can effect significantly. In this study, the results are  $(-0.711)$ , indicating a negative and statistically significant link with financial distress. This suggests that CEO duality has a greater impact on financial trouble than board diversity.

Another distinction is that the commissioner board owns capital. Based on [Widhiadnyana and Dwi Ratnadi \(2019\)](#), independent boards can increase operational oversight, corporate governance, and financial hardship. The board of commissioners evaluates businesspeople and selects directors and audit committees. Inclusive attitudes boost performance and reduce financial risk for women and men. Social identity theory suggests that the commissioner board may exacerbate financial misery for women. The board of commissioners' women can influence decisions. To succeed, they need to interact with men more frequently. Interaction involves assurances like the board of directors following the board of commissioners' event directions to manage firm operations. Corporate governance oversees the company's operations. The board of commissioners provides advice to the management team. The chief commissioner is often the principal, who works with directors to advance the firm. Independent commissioners defend stakeholders and do not control owners. During financial crises, independent commissioners consult company boards more. Women can advise and make decisions, improving idea inclusivity regardless of organizational representation. Including women in a corporation may broaden its viewpoint and help it achieve its goals. Thus, a male and female board of commissioners can influence executive decision making by setting performance and strategic behavior requirements. Women on the board of commissioners are the only factor that statistically enhances financial institution decision making.

This study supports [Bernile et al. \(2018\)](#), who found a negative link between board diversity and corporate risk. [Kristanti et al. \(2016\)](#) found that female directors reduce the risk of financial trouble for businesses by improving firm performance. Female directors are risk averse, which explains this conclusion. The data show that gender diversity on the board of directors (GDB) ( $b = 0.0114$ ) and audit committee (GDA) ( $b = 0.0844$ ) did not affect financial hardship. This improves corporate performance and reduces financial crisis risk. The above findings also confirm upper-level executives' belief that top management decisionmakers' backgrounds and skills affect business success. This study strengthens the integrated resource reliance and agency principle. The results show that highly skilled directors, as board capital, improve the board's ability to oversee and provide resources and advisory services ([Hillman and Dalziel 2003](#)).

#### 4.5. Moderating Effect of CEOD on the Association

Table 6 shows that CEO duality (CEOD) affects the risk of financial distress (FD) and gender diversity. According to the study, CEO duality affects financial hardship scores. CEO duality negatively correlates with financial difficulty. Understanding this phenomenon is crucial, since it affects an organization's internal dynamics and stability and resilience during economic crises. Financial distress—when a company cannot meet its financial obligations—has been a major focus of CEO duality research. CEO duality's effects on financial crises affect company decisionmakers, investors, and regulators. Organizations that implement CEO duality should understand its risks. Implementing rigorous risk management, increasing board independence, and establishing clear reporting channels alleviate the financial hardship effects of CEO duality.

[Bhaskar et al. \(2017\)](#) found that duality structures might cause financial suffering due to conflicts of interest and poor management. CEO duality hinders corporate governance and raises financial suffering, according to a meta-analysis by [Khan et al. \(2021\)](#). This study examined gender diversity and financial distress through CEO duality's moderating effect. Table 6 shows that CEO duality affects the statistically substantial positive link between gender diversity and financial distress. CEO duality gives the CEO more power

and influence on the board in serving as president and chairman (Khan et al. 2021). Duality on the board of directors can impair corporate governance, influence other board members, and affect monitoring and control. The gender diversity coefficient had a negative effect on the commissioner board, board of directors, and audit committee board before the moderating effect and influence of two CEOs were taken into consideration (Table 5).

Gender diversity was found to positively affect financial distress (FD) after controlling for CEO duality. Gender diversity on the commissioner board (GDC) positively and statistically significantly affected FD likelihood (0.418,  $p < 0.01$ ). The gender diversity coefficient (GDB)-FD coefficient is similar. CEO power has a larger, negative, and statistically significant effect on gender diversity and financial distress. This suggests that CEO dualism increases the risk of financial hardship more than board diversity. The management discretion theory attributes CEO self-interest to a vertical power disparity. However, the study found that dominant CEOs' self-serving behaviors affect commissioner board, director board, and audit committee diversity. A large body of evidence suggests that CEO dualism affects a firm's financial problems. The accumulation of power in one person without strong oversight and accountability may lead to strategic choices that increase financial vulnerabilities. However, these outcomes must be interpreted in light of sectoral and organizational differences. As corporate governance evolves, understanding CEO duality and its impact on financial hardship is vital for organizations' long-term viability and financial health.

## 5. Conclusions

Diversity in governance can affect strategic decision making and board dynamics. This study compared gender diversity and financial problems. This study addressed an undiscovered subject and improved the approach by assessing the marginal effects of gender diversity on financial hardship, taking board features into consideration. During the period from 2012 to 2021, an examination of 224 Bursa Malaysia-listed non-financial firms found that gender diversity on corporate boards improves board effectiveness, which helps in decreasing scandals and chances of corporate bankruptcy. Women directors, whether independent or within, are less likely to have financial issues. The above findings demonstrate the importance of electing women to corporate boards to regulate managerial conduct and protect shareholder interests. Women on corporate boards may also improve managerial oversight and governance (Adams and Ferreira 2009). These individuals improve the firm's ability to create and implement effective plans to address financial, economic, and environmental constraints. Higher board independence strengthens the link between female board presence and reduced financial distress. The findings show that female directors improve board supervision and decision making.

Our analysis supports the claim that female directors are better monitors and are vital to corporate governance (Benkraiem et al. 2017; Guizani and Abdalkrim 2022). Generally, a company creates three different kinds of director-led boards. These boards are the audit committee board, the board of directors, and the commissioner board. The gender diversity on the commissioner board (GDC), the board of directors (GDB), and the audit committee board is taken into consideration in the current study. The study found that GDC significantly and negatively affects financial distress more than GDA. GDB improves FD likelihood but is not statistically significant. This study shows that a diverse board of directors improves a firm's financial operations and capabilities, allowing it to meet its obligations and improve performance while reducing the risk of financial distress for Malaysian listed companies. The results show that H1 and H2 are accepted to have a significant impact of gender diversity on financial distress, while H3 is rejected due to having an insignificant relationship with financial distress. The negative gender bias on the board of commissioners is noticeable. In this case, the commissioner represents the most financially distressed boardroom as a capital owner. Women directors on corporate boards lessen financial strain for firms. The impact of gender diversity in corporate governance on financial performance has been studied. This study examines this link and shows



that organizations with gender diversity on their boards of commissioners have reduced financial distress. [Widhiadnyana and Dwi Ratnadi \(2019\)](#) found that an autonomous corporate governance board improves operational oversight.

[Hechavarría et al. \(2019\)](#) found that female corporate leaders emphasize social value more. This study supports [Cha et al. \(2019\)](#), who found that women in corporate operations reduce its prevalence. This study examined how CEO duality moderates the gender diversity–financial distress link. This study shows that CEO authority positively affects board diversity and financial difficulties. There is evidence that CEOs' authority impacts financial hardship. In CEO duality, gender diversity on the board moderates financial turmoil. Despite board diversity, CEO duality makes it harder for listed corporations to achieve their financial duties. CEO duality unites power in one person as CEO and board chair. This consolidation of power allows the CEO to influence the board of directors' decision-making process, potentially manipulating decisions and organizational structure for their own benefit. The MCCG explicitly recommends non-duality on the board for corporate governance. Financial difficulty is negatively correlated with board diversity. However, the study found that CEO duality on the board reduces financial distress. There is a moderator effect of CEO duality on financial distress. It reduces financial strain from board diversity. CEO duality affects financial distress differently than board diversity. In addition, non-dualistic boards with diverse makeup routinely make better decisions. The findings of this study affect executives, investors, and practitioners. This study found that board diversity reduces financial distress and CEO self-interest.

This study may also help regulators and lawmakers draft board diversity laws. When discussing board composition, they should examine diversity as a whole rather than just one aspect. Malaysia is one of the countries without board diversity rules. This study will show MCCG authorities that strict board diversity regulations can reduce financial crisis risk for corporations. According to managerial decision theory, a board with diverse backgrounds and perspectives is better able to limit financial risk. CEO dualism can encourage CEOs to misallocate business resources for personal gain, putting the company at risk of bankruptcy. Shareholders, directors, and external analysts must watch over a corporation successfully. This involves weighing the pros and cons of CEO duality and the importance of a good CEO who helps the company achieve long-term goals. This study only examined board diversity at equilibrium and financial hardship. However, it does not fully explain how board diversity affects financial distress. Additionally, this study examines Malaysian public corporations, and the results and findings are limited to Malaysian listed firms. This strategy could be used in other emerging and mature economies without board diversity laws. Future studies must also examine if similar events occur among distinct cohorts of employees and leaders in different organizational settings and hierarchies. Moreover, future studies can focus on the qualitative aspect of the current study while taking into account the Islamic banking system or Islamic governance structure. Future studies can also consider the use of AI tools in helping to improve the performance of listed firms and minimize the risk of financial distress.

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