
Article:
Al-Haddad, L.M., Gerged, A.M. orcid.org/0000-0001-6805-2737, Al-Gharaibeh, M. et al. (2 more authors) (2024) Enhancing corporate resilience: the impact of female board representation on financial distress in Jordanian companies. Corporate Governance. ISSN 1472-0701

https://doi.org/10.1108/CG-01-2024-0023

Enhancing Corporate Resilience: The Impact of Female Board Representation on Financial Distress in Jordanian Companies

Lara M. Al-Haddad[1]

Ali Meftah Gerged[2]

Mohammad Al-Gharaibeh[3]

Zaid Saidat[4]

Tariq Aziz[5]

Compliance with Ethical Standards:

i. Disclosure of potential conflicts of interest: all authors declare that they have no conflicts of interest.
ii. Research involving Human Participants and/or Animals (not applicable)
iii. Informed consent (not applicable)

[1] Corresponding author
Faculty of Economics and Administrative Sciences, Yarmouk University, P.O Box: 21163, Jordan, Irbid
Email address: lara.haddad@yu.edu.jo
Mobile phone number: 00962779661447

[2] Sheffield University Management School, The University of Sheffield, Conduit Road, S10 1FL, Sheffield, UK; and Misurata University, Misurata City, PO Box 2478, Libya.
Email address: ali.gerged@dmu.ac.uk
https://orcid.org/0000-0001-6805-2737

[3] Department of Banking and Finance, Faculty of Economics and Administrative Sciences, Yarmouk University, Irbid, Jordan.
Email address: gharibeh@yu.edu.jo
[4] Department of Finance and Banking, Faculty of Business, Applied Science Private University, Amman, Jordan
Email address: z_saidat@asu.edu.jo

[5] Prince Muhammad bin Fahd University, Al-Khobar, Saudi Arabia
Email address: tarziz@pmu.edu.sa

Enhancing Corporate Resilience: The Impact of Female Board Representation on Financial Distress in Jordanian Companies

Abstract

Purpose – This paper examines the impact of board gender diversity on the likelihood of financial distress in 90 Jordanian companies listed on the Amman Stock Exchange from 2010 to 2021.

Design/Methodology/Approach – To examine our hypotheses, we utilized the Panel Logistic Regression. In addition, we employed the Two-staged Heckman Regression Model as a robust check. To proxy for the financial distress, the 2005 version of Altman's Z-score for emerging markets was employed.

Findings – Our results indicate that female directors can reduce the likelihood of financial distress in Jordanian listed companies. These findings align with previous literature that highlights the benefits of female directors on corporate boards.

Originality/Value –This study, the first to examine the impact of board gender diversity on financial distress in Jordan and the Middle East, highlights several practical implications. It emphasizes the need for policymakers to develop regulations that promote gender diversity on corporate boards as a strategy to enhance stability and prevent financial distress. For corporate managers, incorporating more women into board roles could strengthen decision-making and risk management. Regulators are advised to support these changes through improved governance codes. Additionally, increasing female board participation could enhance corporate responsibility, reduce bankruptcy risks, and boost overall economic stability, benefiting society at large.

Keywords- board characteristics, female directors, gender diversity, Jordan, financial distress.

Paper type- Research paper.

1. Introduction

Recently, following the 2008 financial crisis and financial scandals at several prominent multinational corporations like WorldCom, Enron, American Investment Group, and Lehman Brothers, there has been increased attention from researchers on analyzing how corporate governance mechanisms affect a company's financial distress. Mumford (2003) defined the financial distress as a situation where the company cannot meet its financial obligations. According to Gilbert (1990), financial distress can be considered a situation in which the company generates negative earnings for multiple years in a row. Shah (2016) clarifies that the likelihood of financial distress relies on corporate governance practices, including aggressive managerial behavior, boards' competencies or inadequacy, and board oversight. Thus, poor corporate governance is one of the main reasons that create financial distress as it ruins many companies in diverse sectors and nations all over the world (Salloum et al. 2012). Hence, the incidence of financial distress is a widespread issue that has negatively influenced both developed and emerging markets.

Several studies have focused on the impact of corporate governance variables on financial distress and their predictive potential (e.g. Shahwan, 2015; Darrat et al. 2016; Younas et al. 2021; Garcia and Herrero, 2021; Guizani and Abdalkrim, 2022 Gerged et al. 2022; among others). While much of the existing literature has focused on board characteristics such as board size, board independence, and CEO duality, there has been limited investigation into the impact of female directors on corporate financial distress. Female directors are considered a vital element of corporate governance. They potentially enhance financial reporting quality and ensure the protection of shareholders' rights while aligning them with the interests of company executives (Guizani and Abdalkrim, 2022). Studies, including Adams and Ferreira (2009), suggest that female directors on boards contribute to improved monitoring as they are more inclined to ask questions and less likely to compromise shareholders' interests, mitigating thereby agency conflicts. In addition, female directors are perceived to be less overconfident and more risk-averse than their male counterparts, suggesting a more cautious approach in decision-making (Garcia and Herrero, 2021). Thus, the inclusion of female directors on corporate boards can influence the strategic financial decisions of a company by reducing its business risk (Bernile et al. 2018), enhancing its optimal investment (Harjoto et al. 2018) and improving its performance (Ararat et al. 2015; Hussain et al. 2024; Xie et al. 2024), mitigating the harmful impact of earnings manipulations on environmental, social, and governance (ESG)

performance (Adeneye et al. 2024), affecting therefore the likelihood of financial distress (Yousaf et al. 2021; Garcia and Herrero, 2021 Gerged et al. 2022; Guizani and Abdalkrim, 2022).

Recently, there have been numerous calls for greater female representation on corporate boards. According to Garcia and Herrero (2021), various European countries have mandated a forty percent quota in their governance codes. In Malaysia, the government recommended that listed companies have thirty percent female representation at the decision-making level (Al-Dhamari et al. 2016). In China, UlAin et al. (2020) have advocated for legislation supporting gender diversity on boards and creating supportive work environments for women. Despite these initiatives, the representation of female directors in the largest 142 public companies in the MENA region remains low, with women occupying only 4.8% of total voting board seats out of 1,258, as reported in the 2019 OECD report 'Corporate Governance in MENA: Building a Framework for Competitiveness and Growth'.

The Global Gender Gap Report reveals gradual but steady progress in gender diversity in the MENA region. Jordan is a particularly interesting case for this study for several reasons. Firstly, although the MENA region still has the largest gender gap, Jordan has shown rapid progress, with an equal number of women and men in managerial positions. However, women's participation in the labor force remains limited to 15%, underscoring the persistent gender diversity gap (World Economic Forum, 2021). Moreover, although female workers in the Jordanian labour market are protected by the Jordanian Labour Law no. (8) 1996, they still confront some difficulties in the labour market, and differences in employment positions and salary range are apparent when compared with their males' counterparts (Ibrahim and Hanefah, 2016). Secondly, the prevalence of family-owned businesses in Jordan, with board member selection often based on personal relationships rather than professional qualifications, may affect the effectiveness of corporate governance mechanisms and the likelihood of financial distress. Lastly, the 2009 Jordanian Corporate Governance Code and the 2017 Corporate Governance Instructions for Shareholding Listed Companies in Jordan are still silent regarding the board gender diversity matter. Hence, it is worth considering the financial consequences of gender diversity on corporate boards in Jordan in order to lead regulatory bodies on this important issue. Further, it is worth controlling for the possible impact of other significant board characteristics, such as board independence, board size, and CEO-duality on the probability of financial distress in Jordanian companies as the effectiveness of the board is

considered an important determinant of the companies' financial distress likelihood (Garcia and Herrero, 2021 Gerged et al. 2022; Guizani and Abdalkrim, 2022).

This research offers several contributions to the existing literature. Firstly, previous studies have not conclusively determined the impact of female directors on financial distress probability. For instance, while some studies (e.g., Darrat et al. 2016; Kristanti et al. 2016; Mittal and Lavina, 2018; Garcia and Herrero, 2021; Gerged et al. 2022; Guizani and Abdalkrim, 2022) found that female directors reduce the likelihood of financial distress, others (e.g., Santen and Donker, 2009; Salloum et al. 2013; and Saima and Arefin, 2021) documented opposing effects or failed to establish a significant relationship. Our study addresses this gap by providing further evidence of the influence of female directors on the likelihood of financial distress in Jordanian companies. Secondly, most prior studies on this topic have been conducted in developed countries; our study, however, focuses on an emerging economy, Jordan, to glean new insights, especially given the growing interest in increasing female participation on corporate boards. To the best of our knowledge, this study is the first to explore the impact of board gender diversity on financial distress in Jordan and the broader Middle East region. Lastly, our findings offer valuable insights for policymakers, regulators, managers, academics, and the society as a whole in Jordan and other emerging economies with similar conditions.

The remainder of this research is structured as follows: Section 2 reviews the previous literature and formulates research hypotheses. Section 3 describes the research design and explains variables measurement. Section 4 presents the empirical results and the robustness check. Section 5 concludes the results, limitations, and recommendations for future research.

2. Literature Review, Theoretical Underpinning and Hypotheses Development

In academic literature, the impact of board diversity on corporate financial distress has been explored through several theoretical lenses: the agency theory, the resource dependence theory, and the upper echelon theory. The agency theory suggests that gender diversity on boards improves the supervisory function of managers, as more diverse boards comprise directors from different beliefs and backgrounds (Benkraiem et al. 2017). According to Adams and Ferreira (2009), female directors ask more questions and are less likely to disrupt shareholder interests, hence moderating agency conflicts. Conversely, the resource dependence theory argues that gender diversity on boards enhances the advisory role of management, as diverse board members can provide valuable resources such as information, knowledge, skills,

and external connections (Loukil et al. 2019; Guizani and Abdalkrim, 2022). This in turn, enhances the chance of the company to meet its challenges more efficiently (Ullah et al. 2020). The upper echelon theory emphasizes that management's perceptions, cognitions, and values, can predict the organizational outcomes, such as strategic choices and performance (Hambrick and Mason, 1984). The theory postulates that observable demographic characteristics such as gender, work experience, and education are appropriate proxies to signify the psychological attributes of individuals. These management characteristics will eventually display in a business's strategies, choices, and outcomes (Komal et al. 2023). According to Vähämaa (2014), female directors are more conservative and, usually, they are better educated than male directors, which assists them in developing their cognitive abilities and obtaining the technical skills needed for enhancing their supervising role (Hillman et al. 2002).

In a nutshell, all these theories suggest that more diverse boards possess superior monitoring and advisory capabilities, potentially improving firm performance and reducing the likelihood of financial distress.

Previous literature presents conflicting outcomes regarding the influence of board diversity on financial distress probability. For instance, Darrat et al. (2016), in a study of 9,100 healthy firm-years excluding bankrupt firms, found that companies with more diverse boards are less likely to declare bankruptcy. This aligns with Benkraiem et al. (2017) and UlAin et al. (2020), who document a positive relationship between female representation and operating performance due to enhanced monitoring. Additionally, Kristanti et al. (2016) investigated the impact of corporate governance and financial ratios on financial distress in Indonesian family firms from 2008 to 2013. Their results indicate a significant negative relationship between gender diversity and financial distress, suggesting that female directors help prevent firms from becoming financially distressed. Mittal and Lavina (2018) examined this impact in Indian listed family firms from 2013 to 2016, finding an inverse relationship between the presence of female directors and financial distress probability.

Yousaf et al. (2021) explored the predictive power of different board diversity features for financial distress in Chinese A-listed companies during 2007–2016. They classified board diversity into structural (independence), relation-oriented (gender and age), and task-oriented (education and expertise) categories. Assessing six statistical and machine learning models, they found that these characteristics can predict financial distress likelihood in Chinese companies. Similarly, García and Herrero (2021) examined the impact of gender diversity on

the capital structure of European companies from 2002 to 2019. They found that the presence of female directors is significantly and negatively related to the cost of debt, debt maturity, and leverage and is associated with a lower possibility of financial distress.

Furthermore, Guizani and Abdalkrim (2022) employed Panel Logistic Regression and Dynamic Generalized Method of Moments to study the influence of board gender diversity on firm financial distress in 367 non-financial companies listed on Bursa Malaysia from 2011 to 2019. Using the Altman Z-score model, they discovered that gender diversity might enhance board effectiveness and prevent bankruptcy and financial distress. Their results also suggest that the impact of female directors on financial distress probability is amplified by more independent boards. Likewise, based on a sample of 110 FTSE350 manufacturing companies for the period that ranges from 2014 to 2019, Gerged et al. (2022) explored the possible implications of compliance with corporate governance mechanisms, involving ownership structures and board composition, on the likelihood of financial distress Using the random-effects logistic regression model, their results implies that board composition and ownership structure are heterogeneously associated with the probabilities of financial distress in that they might have either increased or reduced the financial distress. That is, gender diversity, board independence, audit committee independence, and institutional ownership appeared to be negatively associated with the probability of financial distress. However, ownership concentration appeared to be positively associated with financial distress.

Most recently, Ali et al. (2023) showed that gender diversity on board is effective in reducing the financial distress likelihoods for a sample of 13,740 firm-year observations from China for the period ranging from 2009 to 2018. Besides, they report that the power of the Chief Executive Officer can positively moderate this relationship. That is, having gender diversity in the boardroom combined with strong CEOs helps to lessen the chance of financial distress by preventing top executives from making poor financial decisions in an effort to enrich themselves.

On the other hand, Santen and Donker (2009), Salloum et al. (2013), and Saima and Arefin (2021) presented contrasting results or failed to establish a significant relationship between board gender diversity and financial distress in their studies. Given this, and considering the inconsistent results of previous literature, the following hypothesis is formulated:

H1: The presence of female directors on the board has a significant effect on the likelihood of financial distress.

3. Data and Methodology

3.1 Sample and Data

To investigate our research hypotheses, we utilized a dataset comprising Jordanian companies listed on the Amman Stock Exchange during the period from 2010 to 2021. We started by 2010 because it was the first financial year after the development and implementation of the 2009 Corporate Governance Code for Shareholding Companies Listed on the Amman Stock Exchange. Our data were hand-collected from the annual reports of Jordanian companies available on the Amman Stock Exchange website. We focused on two key sectors in Jordan: the industrial and the services sectors. To maintain consistency with previous literature, we excluded the financial sector because it has a distinct financial reporting process and different corporate governance regulations when compared to the other two sectors. The exclusion of this sector results in a sample of 95 companies. Our final sample consists of 90 companies, amounting to 1,080 firm-year observations. In order to eliminate the effect of outlier bias, following Al-Haddad and Whittington (2019), we winsorized the top and bottom 1 percent of our independent and dependent variables.

3.2 Empirical Models

In order to inspect the impact of board gender diversity on the likelihood of Jordanian companies' financial distress, the following models were identified:

$$Logit\ FD_{it} = \alpha + \beta 1\ FBRD_{it} + \sum \beta 2\text{-}4\ BOARD_{it} + \sum \beta 5\text{-}8\ CONT_{it} + \varepsilon_{it}$$

$$FD_{it} = \alpha + \beta 1 FD_{t-1} + \beta 2\ FBRD_{it} + + \sum \beta 3\text{-}5\ BOARD_{it} + \sum \beta 6\text{-}8\ CONT_{it} + \varepsilon_{it}$$

Where FDit is the probability of financial distress for the company, and $FBRD_{it}$ is female directors on the board. $BOARD_{it}$ signifies different board characteristics variables, and $CONT_{it}$ signifies control variables attributable to company characteristics.

3.3 Variables Measurements

3.3.1 The Probability of Financial Distress (FD)

Following previous literature (e.g. Shahwan, 2015; Younas et al. 2021, Yousaf et al. 2021; Guizani and Abdalkrim, 2022), the Altman's Z score was employed as a proxy for financial distress. However, we used the 2005 version of Altman's Z score for emerging markets computed as follows:

$$Altman's\ Z\ score = 3.25\ X_1 + 6.56\ X_2 + 3.26\ X_3 + 6.72\ X_4 + 1.05\ X_5$$

Where X1 is defined as working capital divided by the total assets, X2 is defined as retained earnings divided by the total assets, X3 is defined as earnings before interest and taxes divided by the total assets, X4 is defined as market value equity divided by the book value of total debt, X5 is defined as sales divided by the total assets. It is worth noting that that there is an inverse relationship between the Z-score value and the probability of financial distress, denoting that the lower the value of the Z-score, the more likely a firm go bankrupt. Following Guizani and Abdalkrim (2022), Younas et al. (2021), and Garcia and Herrero (2021), Jordanian companies are divided into two categories: financially-distressed and financially-healthy companies. If the Z-score value is less than 1.81, the company is considered financially distressed (it takes the value 1). However, if the Z-score value is 1.81 or above, then the company is considered financially healthy (it takes the value 0).

3.3.2 Female Directors on Board (FBRD):

Female directors on the board is our main explanatory variable, which is quantified as the proportion of female board member's relative to the total number of directors (Mittal and Lavina 2018, Garcia and Herrero, 2021, Gerged et al. 2022; Guizani and Abdalkrim, 2022).

3.3.3 Control Variables:

To better understand the factors influencing financial distress in companies, it's crucial to consider the effectiveness of the board of directors. According to agency theory, the primary role of the corporate board is to monitor senior management and protect shareholder interests (Jensen and Meckling, 1976; Fama and Jensen, 1983). Research indicates that strong corporate governance mechanisms can reduce the risk of financial distress (Garcia and Herrero, 2021; Guizani and Abdalkrim, 2022; Gerged et al. 2022). An essential governance mechanism is the inclusion of independent board members, who are instrumental in overseeing management effectively (Usman et al. 2022B). Frankel et al. (2011) suggest that independent directors support less risky investments, which can help companies avoid financial losses and distress. However, independent directors' effectiveness in monitoring managerial actions and reducing financial distress has been debated, with some studies indicating a positive impact (Li et al. 2008; Fich and Slezak, 2008; Manzaneque et al. 2016; Garcia and Herrero, 2021; Guizani and Abdalkrim, 2022; Gerged et al. 2022), while others like Daily and Dalton (1994) observed a detrimental effect.

The 2017 Corporate Governance Instructions for Shareholding Listed Companies in Jordan recommend that at least one-third of board members be independent to minimize agency costs and information asymmetry (CGI, 2017). Other critical governance tools include board size and CEO-duality. Larger boards may offer more expertise and enhance monitoring capacity, potentially reducing financial distress (Dalton et al. 1998; De Andres and Vallelado, 2008; Manzaneque et al. 2016; Darrat et al. 2016; Berger et al. 2016). However, larger boards could face coordination challenges and decision-making delays (Fich and Slezak, 2008; García and Herrero, 2021), though Gerged et al. (2022) found no link between board size and financial distress. The governance instructions also suggest keeping board size between five and thirteen members (CGI, 2017).

CEO-duality, where the CEO also serves as board chair, can disrupt the balance of power, potentially leading to conflicts of interest and less effective oversight (Fama and Jensen, 1983). The governance instructions advise against this practice (CGI, 2017). While some studies found CEO-duality can decrease financial distress (Miglani et al. 2015), others reported a negative impact (Ali and Nasir, 2018; Younas et al. 2021; Guizani and Abdalkrim, 2022), and some observed no significant effect (Garcia and Herrero, 2021).

In our analysis, we incorporated variables like board independence, board size, and CEO duality. Board independence is measured by the proportion of independent directors, board size by the number of directors, and CEO duality is indicated by whether the board chair is also the CEO. We also controlled for firm-specific factors such as firm size, leverage, book-to-market ratio, liquidity, and profitability, which are significant predictors of a firm's financial health (Garcia and Herrero, 2021; Salem et al. 2021; Guizani and Abdalkrim, 2022; Komal et al. 2022; Usman et al. 2022; Gerged et al. 2023; Salem et al. 2023; Usman et al. 2023).

4. Results and Discussions

4.1 Descriptive Statistics

Table I illustrates the descriptive statistics for all the variables used in our study. As shown in the table, the mean value for financial distress is 0.43, which is significantly lower than the 0.46 reported for European firms by Garcia and Herrero (2021). In terms of gender diversity, the average proportion of female directors on boards is 11.3%, with a range from 0 to 44%. The board characteristics reveal that, on average, 36.8% of the board members in Jordanian companies are independent. The average board size is 7.41, ranging from 7 to 9

members. Furthermore, CEO duality has an average of 16.31%, markedly lower than the 73% reported in Malaysia by Guizani and Abdalkrim (2022).

****Please insert Table I Right Here****

Regarding firm characteristics, the average firm size is 7.14, ranging from 5.5 to 9.2. The mean value of firm leverage is 38.2%. The book-to-market ratio has an average of 1.33, ranging from -2.95 to 8.09. Meanwhile, the liquidity of Jordanian companies has an average of 7.57 with a standard deviation of 58, and profitability ranges from -2.18 to 5.12, with an average of 0.036.

Table II displays the results of the Pearson correlation matrix, examining the relationships between the study variables. As indicated in the table, our variables are not highly correlated with one another, exhibiting only moderate correlations. The highest correlation coefficient among the variables is 0.28, signifying the absence of any significant multicollinearity issue in this research.

****Please Insert Table II Right Here****

Table III presents the mean difference tests for female director representation, board characteristics, and firm characteristics between financially distressed and financially healthy companies. The table indicates that companies experiencing financial distress have a significantly lower proportion of female directors compared to their financially healthy counterparts. This preliminary observation suggests a potential adverse correlation between the presence of female directors and the likelihood of a company facing financial distress.

****Please Insert Table III Right Here****

In addition, board characteristics seem to differ between financially distressed and healthy companies. The average proportion of independent directors in financially distressed companies is 30.2%, while in financially healthy companies it is 35.1%. Board size tends to be larger in financially distressed companies, whereas CEO duality is less common in financially healthy companies. Regarding firm characteristics, financially healthy companies typically exhibit a higher leverage ratio, a lower book-to-market ratio, greater liquidity, and higher profitability compared to their financially distressed counterparts.

4.2 Multivariate Analysis

4.2.1 Panel Logistic Regression Results

Table IV presents the impact of female directors on the likelihood of financial distress, as analyzed using Panel Logistic Regression. The table reveals that the coefficient for the proportion of female directors (FBRD) is negative and statistically significant ($P < 0.01$). This finding suggests that female directors play a crucial role in overseeing managerial behavior and shielding Jordanian companies from financial distress. Our results are in line with agency theory and corroborate findings in previous research, which also highlight the beneficial role of female directors in preventing financial distress. These earlier studies include Darrat et al. (2016), Kristanti et al. (2016), Mittal and Lavina (2018), Yousaf et al. (2021), Garcia and Herrero (2021), Guizani and Abdalkrim (2022), and Gerged et al. (2022).

****Please Insert Table IV Right Here****

Regarding the role of board characteristics as control variables, our results reveal that board independence has a significant and negative relationship with the likelihood of financial distress. This suggests that independent board members are more effective in deterring bankruptcy risk. According to Fama and Jensen (1983), independent managers can effectively monitor managerial behavior and reduce the possibility of financial distress, not only to safeguard the interests of shareholders but also to preserve their market value. This is primarily achieved through sufficient monitoring tasks. This result aligns with previous literature (e.g., Li et al. 2008; Fich and Slezak, 2008; Manzaneque et al. 2016; Garcia and Herrero, 2021; Guizani and Abdalkrim, 2022; Gerged et al. 2022). Additionally, in line with Garcia and Herrero (2021), board size appears to have a significant positive relationship with the probability of financial distress. This suggests that larger boards might face challenges in coordinating efforts, achieving consensus, and exhibiting expertise when making strategic decisions to mitigate financial troubles.

In line with Younas et al. (2021) and Guizani and Abdalkrim (2022), CEO duality appears to have a significant positive relationship with financial distress. This suggests that granting excessive decision-making power to one person might lead to potential conflicts of interest and undermine the valuable monitoring role of the board.

Regarding the remaining control variables, firm size appears to have a significant and negative relationship with the likelihood of bankruptcy risk in Jordanian companies. This

suggests that larger companies have a lower bankruptcy risk due to their operational efficiency and experience. Conversely, leverage amplifies the probability of financial distress, supporting the notion that debt financing negatively impacts a company's profitability due to inherent interest costs, thereby increasing the risk of bankruptcy. However, the book-to-market ratio appears to have an insignificant relationship with the likelihood of bankruptcy risk. Similar to Shahwan (2015) and Guizani and Abdalkrim (2022), more profitable and liquid companies are less likely to fall into bankruptcy.

4.2.2 Robustness Check: Two-stage Heckman Regression Model

We employed the Heckman two-stage method to address the issue of self-selection bias, rather than sample selection bias. Self-selection bias occurs when firms with particular unobserved characteristics that are correlated with both board gender diversity and financial distress outcomes disproportionately self-select into certain board structures (e.g., high levels of diversity). To control for this bias, we followed previous studies (Chung et al., 2015; Mangena et al., 2020; Gerged et al., 2022) that have used the Heckman correction in corporate governance research.

In the first stage of the Heckman model, we used industry-average board gender diversity as an instrumental variable, consistent with prior literature (Chung et al., 2015; Gerged et al., 2022), which captures exogenous variations in board gender diversity. This instrumental variable is theoretically valid as it is correlated with a firm's decision to adopt gender-diverse boards but uncorrelated with the firm's financial distress likelihood, thus satisfying the exclusion restriction.

In the second stage of the Heckman two-stage model, the focus shifts toward addressing the potential bias introduced by self-selection, which could otherwise distort the relationship between the main variables of interest—in this case, gender diversity on corporate boards and financial distress. The key to this stage lies in incorporating the inverse Mills ratio (IMR), derived from the first stage, as a correction factor within the main regression equation.

In this second stage, the IMR functions as an additional explanatory variable within the model, aimed at mitigating the effects of selection bias. Specifically, the IMR accounts for the probability that certain firms—due to unobservable characteristics—are more likely to exhibit certain board structures or governance mechanisms, which may influence financial distress outcomes. Without accounting for this self-selection, the estimated relationship between

gender diversity and financial distress could be biased, potentially leading to misleading conclusions.

In this refined regression model, gender diversity (e.g., female board representation) remains the focal explanatory variable, while the IMR is introduced alongside other control variables, such as board independence, firm size, and leverage. This step ensures that the estimation process adjusts for any unobserved factors that might have influenced the sample selection, ensuring the coefficients for gender diversity and other predictors are estimated without bias. The key assumption here is that, after controlling for the IMR, the remaining error term is not correlated with the explanatory variables, thus satisfying the conditions for consistent estimation.

Critically, the significance of the IMR coefficient itself in this second stage serves as a diagnostic tool. If the IMR is statistically significant, it indicates that self-selection bias was indeed present in the original model and that the correction through the Heckman approach was necessary. Conversely, an insignificant IMR coefficient would suggest that selection bias was not a major concern. However, even in the latter case, employing the two-stage method enhances the robustness of the results by thoroughly addressing any potential endogeneity issues.

The outcomes of this stage should then be compared with those from the initial regression (without the Heckman correction) to evaluate whether the inclusion of the IMR alters the key findings. In contexts such as the relationship between gender diversity and financial distress, where unobserved factors (e.g., firm culture, industry practices) may influence both board composition and financial outcomes, ensuring that the estimates are free from bias is crucial. This second stage, therefore, plays a pivotal role in validating the conclusions drawn about the impact of gender diversity on reducing financial distress, particularly in complex governance environments.

The results, detailed in Table V, are consistent with our main analysis. Specifically, the impact of gender diversity, the presence of independent directors, and CEO duality on the financial distress among Jordanian companies varied, sometimes reducing or increasing the risk. Overall, when comparing these findings with our main analyses, which included Panel Logistic Regression, we found no statistical differences. This consistency supports the robustness of our initial results, affirming that they are likely unaffected by endogeneity issues.

****Please Insert Table V Right Here****

5. Conclusion

This study investigated how board gender diversity affects the financial health of 90 Jordanian companies listed on the Amman Stock Exchange from 2010 to 2021. We used Panel Logistic Regression and the Two-stage Heckman regression model for a robust analysis, and the Altman Z-score model to measure financial distress. The results strongly support increasing female representation on boards, showing that female directors reduce the likelihood of financial distress. This study is the first to examine the influence of board gender diversity on financial distress in Jordan and the wider Middle East, providing key insights for policymakers, regulators, managers, academics, and society in Jordan and similar emerging economies.

Policymakers are encouraged to create guidelines that enhance gender diversity on corporate boards to improve governance and prevent financial issues. Our findings also suggest that regulators should consider the benefits of gender diversity on boards to increase board effectiveness. Additionally, this research helps managers in Jordan's service and manufacturing sectors design boards with a diverse and balanced composition, including a sufficient number of independent members, to avoid financial difficulties. Managers are also advised to separate the roles of chairman and CEO and to optimize board size. For academics, this research lays a groundwork for further studies on corporate governance and financial distress in Jordan. The study also indicates that increasing female board representation can significantly safeguard stakeholder interests by reducing bankruptcy risks.

The research has limitations; it focuses on non-financial companies and covers only a 12-year period, which may limit the applicability of the findings. Future studies could expand the scope to include financial firms, a longer time frame, and a larger sample size. Additional aspects of corporate governance that could influence financial distress should also be explored. Moreover, future research should examine if similar effects are seen among diverse employees and leadership across different organizational levels and settings.

References

Adams, R.B. and Ferreira, D. (2009), "Women in the boardroom and their impact on governance and performance", *Journal of Financial Economics*, Vol. 94 No. 2, pp. 291-309.

Adeneye, Y. B., Fasihi, S., Kammoun, I., & Albitar, K. (2024). Does earnings management constrain ESG performance? The role of corporate governance. *International Journal of Disclosure and Governance*, 21(1), 69-92.

Al-Dhamari, R.A., Ku Ismail, K.I. and Al-Gamrh, B.A. (2016), "Board diversity and corporate payout policy: do free cash flow and ownership concentration matter?", *Corporate Ownership and Control*, Vol. 14 No. 1, pp. 373-383.

Al-Haddad, L. and Whittington, M., 2019. The impact of corporate governance mechanisms on real and accrual earnings management practices: evidence from Jordan. Corporate Governance: *The International Journal of Business in Society*, 19(6), pp.1167-1186.

Ali, M.M. and Nasir, N.M., 2018. Corporate governance and financial distress: Malaysian perspective. *Asian Journal of Accounting Perspectives*, *11*(1), pp.108-128.

Ali, S., ur Rehman, R., Aslam, S., Khan, I. and Murtaza, G., 2023. Does board diversity reduce the likelihood of financial distress in the presence of a powerful Chinese CEO?. *Management Decision*, *61*(6), pp.1798-1815.

Altman, E. I. (2005). "An emerging market credit scoring system for corporate bonds", *Emerging Markets Review,* 6(4), pp. 311-323.

Ararat, M., Aksu, M. and Tansel Cetin, A., 2015. How board diversity affects firm performance in emerging markets: Evidence on channels in controlled firms. *Corporate Governance: An International Review*, 23(2), pp.83-103.

Arellano, M. and Bover, O. (1995), "Another look at the instrumental variable estimation of errorcomponents models", *Journal of Econometrics*, Vol. 68 No. 1, pp. 29-51.

Benkraiem, R., Hamrouni, A., Lakhal, F. and Toumi, N. (2017), "Board independence, gender diversity and CEO compensation", Corporate Governance: *The International Journal of Business in Society*, Vol. 17 No. 5, pp. 845-860.

Bernile, G., Bhagwat, V. and Yonker, S., 2018. Board diversity, firm risk, and corporate policies. *Journal of financial economics*, 127(3), pp.588-612.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, Vol. 87 No. 1, pp. 115-143.

CGI (2017). *"Corporate Governance Instructions for Shareholding Listed Companies".* Available at: https://jsc.gov.jo/Uploads/Files/636346002105495090.pdf (Accessed on: April 2024).

Chung, H., Judge, W. Q., & Li, Y. H. (2015). Voluntary disclosure, excess executive compensation, and firm value. *Journal of Corporate Finance*, *32*, 64-90.

Darrat, A.F., Gray, S., Park, J.C. and Wu, Y. (2016), "Corporate governance and bankruptcy risk", *Journal of Accounting, Auditing and Finance*, Vol. 31 No. 2, pp. 1-40.

De Andres, P., & Vallelado, E. (2008). Corporate governance in banking: The role of the board of directors. *Journal of Banking & Finance*, 32(12), 2570-2580.

Ezeani, E., Salem, R., Kwabi, F., Boutaine, K., Bilal and Komal, B., 2022. Board monitoring and capital structure dynamics: evidence from bank-based economies. *Review of Quantitative Finance and Accounting*, *58*(2), pp.473-498.

Fama, E. F. and Jensen, M. C. (1983). "Separation of ownership and control", *The Journal of Law & Economics,* 26(2), pp. 301-325.

Feng, Y., Hassan, A., & Elamer, A. A. (2020). Corporate governance, ownership structure and capital structure: Evidence from Chinese real estate listed companies. International Journal of Accounting & Information Management, 28(4), 759–783.

Fich, E. M., & Slezak, S. L. (2008). Can corporate governance save distressed firms from bankruptcy? An empirical analysis. *Review of Quantitative Finance and Accounting*, 30 (2), 225–251.

Garcia, C.J. and Herrero, B. (2021), "Female directors, capital structure, and financial distress", Journal of Business Research, Vol. 136 No. 15, pp. 592-601.

Gerged, A. M., Salem, R., & Beddewela, E. (2023). How does transparency into global sustainability initiatives influence firm value? Insights from Anglo-American countries. *Business Strategy and the Environment*, *32*(7), 4519-4547.

Gerged, A. M., Yao, S., Albitar, K. (2022). Board Composition, Ownership Structure and Financial Distress: Insights from UK FTSE 350. *Corporate Governance*. In Press: DOI – 10.1108/CG-02-2022-0069

Gilbert, L.R., Menon, K. and Schwartz, K.B. (1990). Predicting bankruptcy for firms in financial distress. *Journal of Business Finance & Accounting*, *17*(1), 161-171.

Guizani, M. and Abdalkrim, G., 2023. Does gender diversity on boards reduce the likelihood of financial distress? Evidence from Malaysia. *Asia-Pacific Journal of Business Administration*, *15*(2), pp.287-306.

Hambrick, D.C. and Mason, P.A., 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of management review*, *9*(2), pp.193-206.

Harjoto, M.A., Laksmana, I. and Yang, Y.W., 2018. Board diversity and corporate investment oversight. *Journal of Business Research*, *90*, pp.40-47.

Heckman, J. J. (1981). Statistical models for discrete panel data. *Structural analysis of discrete data with econometric applications*, *114*, 178.

Hillman, A.J., Cannella Jr, A.A. and Harris, I.C., 2002. Women and racial minorities in the boardroom: How do directors differ?. Journal of management, 28(6), pp.747-763.

Hussain, S. M., Ahmad, N., Fazal, F., & Menegaki, A. N. (2024). The impact of female directorship on firm performance: a systematic literature review. *Review of Managerial Science*, 18(3), 913-939.

Ibrahim, A.H. and Hanefah, M.M. (2016), "Board diversity and corporate social responsibility in Jordan", *Journal of Financial Reporting and Accounting*, Vol. 14 No. 2, pp. 279-298.

Jensen, M. C. and Meckling, W. H. (1976). "Theory of the firm: Managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, 3(4), pp. 305.

Komal, B., Ezeani, E., Usman, M., Kwabi, F. and Ye, C., 2023. Do the educational profile, gender, and professional experience of audit committee financial experts improve financial reporting quality?. *Journal of International Accounting, Auditing and Taxation*, *53*, p.100580.

Komal, B., Ye, C., & Salem, R. (2022). The impact of audit committee effectiveness on firms' outcomes in China: a systematic review. *International Journal of Accounting & Information Management*, *30*(5), 583-599.

Kristanti, F. T., Rahayu, S., & Huda, A. N. (2016). The determinant of financial distress on Indonesian family firm. Procedia-Social and Behavioral Sciences, 219, 440–447. https://doi.org/10.1016/j.sbspro.2016.05.018.

Li, H.X., Wang, Z.J. and Deng, X.L. (2008), "Ownership, independent directors, agency costs and financial distress: evidence from Chinese listed companies", Corporate Governance: *The International Journal of Business in Society*, Vol. 8 No. 5, pp. 622-636.

Liang, D., Tsai, C. F., Lu, H. Y. R., & Chang, L. S. (2020). Combining corporate governance indicators with stacking ensembles for financial distress prediction. Journal of Business Research, 120, 137–146. https://doi.org/10.1016/j. jbusres.2020.07.052.

Mangena, M., Priego, A.M. and Manzaneque, M., 2020. Bank power, block ownership, boards and financial distress likelihood: An investigation of Spanish listed firms. *Journal of Corporate Finance*, *64*, p.101636.

Manzaneque, M., Priego, A.M. and Merino, E., 2016. Corporate governance effect on financial distress likelihood: Evidence from Spain. *Revista de Contabilidad*, *19*(1), pp.111-121.

Miglani, S., Ahmed, K. and Henry, D., 2015. Voluntary corporate governance structure and financial distress: Evidence from Australia. *Journal of Contemporary Accounting & Economics*, *11*(1), pp.18-30.

Mittal, S. and Lavina, 2018. Females' representation in the boardroom and their impact on financial distress: An evidence from family businesses in India. Indian Journal of Corporate Governance, 11(1), pp.35-44.

Mumford, M. (2003). Corporate Governance and Financial Distress: when structures have to change. *Corporate Governance*, 11(1), 52-64.

Saima, F.N. and Arefin, K.A., 2022. Board gender diversity and financial distress risk: evidence from Bangladesh. *Journal of Innovation in Business Studies*, 2(1), pp.31-64.

Salem, R. I. A., Ghazwani, M., Gerged, A. M., & Whittington, M. (2023). Anti-corruption disclosure quality and earnings management in the United Kingdom: the role of audit quality. *International Journal of Accounting & Information Management*, *31*(3), 528-563.

Salem, R., Usman, M., & Ezeani, E. (2021). Loan loss provisions and audit quality: Evidence from MENA Islamic and conventional banks. *The Quarterly Review of Economics and Finance*, *79*, 345-359.

Salloum, C., Azoury, N. and Azzi, T. (2013), "Board of directors' effects on financial distress evidence of family owned businesses in Lebanon", International Entrepreneurship and Management Journal, Vol. 9 No. 1, pp. 59-75.

Santen, B. and Donker, H. (2009), "Board diversity in the perspective of financial distress: empirical evidence from The Netherlands", Corporate Board Role and Composition, Vol. 5 No. 2, pp. 23-35.

Shah, S.B.H., 2016. *The impact of corporate governance on financial distress; Evidence from Pakistan* (Doctoral dissertation, Capital University).

Shahwan, T.M., 2015. The effects of corporate governance on financial performance and financial distress: evidence from Egypt. *Corporate Governance*, 15(5), pp.641-662.

UlAin, Q., Yuan, X., Javaid, H.M., Usman, M. and Haris, M. (2020), "Female directors and agency costs: evidence from Chinese listed firms", *International Journal of Emerging Markets*, Vol. 16 No. 8, pp. 1604-1633.

Ullah, I., Zeb, A., Khan, M.A. and Xiao, W. (2020), "Board diversity and investment efficiency: evidence from China", *Corporate Governance: The International Journal of Business in Society*, Vol. 20 No. 6, pp. 1105-1132.

Usman, M., Ezeani, E., Salem, R. I. A., & Song, X. (2022). The impact of audit characteristics, audit fees on classification shifting: evidence from Germany. *International Journal of Accounting & Information Management*, *30*(3), 408-426.

Usman, M., Nwachukwu, J. and Ezeani, E., 2022A. The impact of board characteristics on the extent of earnings management: conditional evidence from quantile regressions. *International Journal of Accounting & Information Management*, *30*(5), pp.600-616.

Usman, M., Nwachukwu, J., Ezeani, E., Salem, R. I. A., Bilal, B., & Kwabi, F. O. (2023). Audit quality and classification shifting: evidence from UK and Germany. *Journal of Applied Accounting Research*.

Usman, M., Salem, R. and Ezeani, E., 2022B. The impact of board characteristics on classification shifting: evidence from Germany. *International Journal of Accounting & Information Management*, *30*(5), pp.565-582.

Vähämaa, E., 2014. Executive turnover, gender, and earnings management: An exploratory analysis. *Accounting Perspectives*, 13(2), pp.103-122.

World Economic Forum. (2021). Global gender gap report 2021. Retrieved from https://www.weforum.org/reports/global-gender-gap-report-2021.

Xie, F., Guo, Y., Daniel, S.J. et al. The dynamic relation between board gender diversity and firm performance: the moderating role of shareholder activism. *Rev Quant Finan Acc* 62, 225–246 (2024).

Younas, N., UdDin, S., Awan, T. and Khan, M.Y. (2021), "Corporate governance and financial distress: Asian emerging market perspective", Corporate Governance: The *International Journal of Business in Society*, Vol. 21 No. 4, pp. 702-715.

Yousaf, U.B., Jebran, K. and Wang, M., 2021. Can board diversity predict the risk of financial distress? Corporate Governance: The International Journal of Business in Society, 21(4), pp.663-684.

Table I:
Descriptive Statistics

Variables	Mean	Median	SD	Min	Max
FD	0.4319	0.3865	0.3993	0.0000	1.0000
FBRD	0.1131	0.0933	0.2721	0.0000	0.4444
BNDP	0.3687	0.2904	0.2691	0.1931	0.5123
BSZE	8.1256	8.0000	2.5212	7.0000	9.0000
CEOD	0.1631	0.0000	0.3513	0.0000	1.0000
FSZE	7.4158	7.4496	0.6166	5.5831	9.2469
LEV	0.3820	0.32075	0.2764	0.0002	1.9037
BTM	1.3355	0.9900	0.9906	-2.950	8.0981
LIQ	7.5789	1.36177	58.0555	0.00824	934.1964
PORF	0.0362	0.0283	0.1757	-2.1830	5.1290

Note: See Appendix 1 for variables definitions.

Table II:
Correlation Matrix

Variables	FBRD	BNDP	BSZE	CEOD	FSZE	LEV	BTM	LIQ	PROF
FBRD	1								
BNDP	-0.037***	1							
BSZE	0.051**	0.281**	1						
CEOD	0.021*	0.022	0.036**	1					
FSZE	-0.045**	0.056*	0.075*	-0.056*	1				
LEV	0.021	-0.034	0.028**	-0.032***	0.051**	1			
BTM	0.012	0.025	-0.014*	-0.079	0.045	0.02	1		
LIQ	-0.024*	0.078	0.015	0.061**	0.039	0.098*	-0.043	1	
PORF	-0.033**	0.091*	-0.077*	0.011*	0.052***	0.176	-0.067	0.044*	1

Note: See Appendix 1 for variables definitions. ****, **, *Indicate significance at 1, 5 and 10% levels, respectively.*

Table III:
Mean difference tests between financially distressed companies and financially healthy companies

Variables	Financially-distressed companies	Financially-healthy companies	Mean difference test
FBRD	0.107	0.151	-0.044***
BNDP	0.302	0.351	-0.049*
BSZE	8.231	6.349	1.882**
CEOD	0.159	0.111	0.048*
FSIZE	6.41	7.13	-0.72*
LEV	0.165	0.210	-0.045**
BTM	0.533	0.511	0.022
LIQ	0.778	0.812	-0.034***
PORF	0.033	0.37	-0.337**

Note: This table exhibits the mean difference tests between financially-distressed companies and financially-healthy companies. ***, **, *Indicate significance at 1, 5 and 10% levels, respectively. See Appendix 1 for variables definitions.

Table IV:
Panel Logistic Regression Results

Variables	Coefficients	t. Statistic	p-value
FBRD	-0.1485824	-2.88***	0.001
BNDP	- 1.4839155	-2.55**	0.045
BSZE	0.4805425	1.95*	0.094
CEOD	0.7424671	1.91*	0.069
FSIZE	-0.1730073	-3.63***	0.000
LEV	0.0654769	2.42**	0.032
BTM	0.5362840	1.23	0.134
LIQ	-0.2494059	-2.22**	0.035
PORF	-3.3206341	-2.60***	0.002
Constant	2.4992145	2.28**	0.033
Adj R-squared		38.13%	

Notes: See Appendix 1 for variables definitions. ***, **, *Indicate significance at 1, 5 and 10% levels, respectively. The parameter estimates are based on the following model: *Logit FDit= α+ β1 FBRDit+∑β2-4 BOARDit+∑β5-8 CONTit+εit*

Table V:
Two-Stage Heckman Regression Model

Variables	First-Stage (Selection Equation)	Second-Stage (Outcome Equation)	t. Statistic	p-value
FBRD	0.1284361	-0.1752471	-2.91***	0.001
BNDP	1.3267743	-1.3582412	-2.47**	0.035
BSZE	0.4462371	0.4279362	1.86*	0.096
CEOD	0.6877411	0.7928771	1.99**	0.023
FSIZE	0.4166719	-0.3165581	-2.61***	0.002
LEV	-0.1382710	0.0622931	2.33**	0.022
BTM	0.2847519	0.6286129	1.61	0.164
LIQ	0.1572913	-0.5956120	-2.11**	0.035
PORF	-0.4723134	-3.8837146	-2.29***	0.006
Inverse Mills Ratio		0.163	2.54**	0.064
Constant		2.4462310	2.36**	0.046

Notes:

1. *** ** *Indicate significance at 1%, 5%, and 10% levels, respectively.
2. The first-stage regression estimates the selection equation, where variables such as firm size (FSIZE), leverage (LEV), and industry-average gender diversity (FBRD_avg) are used to model the selection process.
3. The second-stage regression estimates the outcome equation with financial distress as the dependent variable and includes the inverse Mills ratio (IMR) to correct for selection bias.
4. The inverse Mills ratio coefficient is significant, indicating the presence of selection bias, and its inclusion corrects for this bias in the second stage.

Appendix I:
Variables Definitions

Variables	Definition
FD	Financial distress, dummy variable that takes a value of 1 if the Altman's (2005) Z score value is less than 1.81. However, if the Z-score value is 1.81 or above, it takes a value of 0. The Altman's (2005) Z score for emerging markets is calculated as follows: Z score= 3.25 + 6.56 (working capital / total assets) + 3.26 (retained earnings / total assets) + 6.72 (operating income / total assets) + 1.05 (book value of equity / total liabilities).
BNDP	Board independence, measured by the number of independent directors on the board scaled by the total directors.
BSZE	Board size, measured by the number of directors on the board.
CEOD	CEO-duality, dummy variable that takes the value 1 if the chairperson of the board is the CEO and 0 otherwise.
FSIZE	Firm size, measured by the natural log of total assets.
LEV	Leverage, calculated by the ratio of total debt to total assets.
BTM	Book-to-market ratio.
LIQ	Liquidity, calculated by the ratio of current assets to current liabilities.
PORF	Profitability, calculated by the ratio of earnings before interest and taxes divided by total sales.