“Financial distress in Jordanian industrial firms: The role of governance quality, leverage, and firm performance”

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FINANCIAL DISTRESS IN JORDANIAN INDUSTRIAL FIRMS: THE ROLE OF GOVERNANCE QUALITY, LEVERAGE, AND FIRM PERFORMANCE

Abstract

This study examines the relationship between governance quality, leverage, and firm performance and financial distress in Jordanian industrial companies listed on the Amman Stock Exchange (ASE). The industrial sector was chosen for this study due to its capital-intensive nature, reliance on external funding, and ongoing operational and market challenges in Jordan. The sample consists of 474 observations from 2014 to 2022. The quality of governance is represented by board size and board independence, leverage is represented by the debt-to-assets ratio, and firm performance is represented by gross margin. For financial distress, the integrated logit model indicates that board size is not statistically significant (coefficient = 0.078, p = 0.361), and the board independence is also not statistically significant (coefficient = 2.341, p = 0.076). Leverage, on the other hand, has a positive and significant association with financial distress (coefficient = 3.560, p = 0.001), while gross margin is negatively and significantly associated with financial distress (coefficient = –9.614, p < 0.001). The results suggest that financial distress for Jordanian industrial firms is primarily attributed to financing pressure and operating performance, and that the governance proxies used in this study do not adequately explain financial distress.

Keywords distress risk, board structure, debt ratio, profitability, industrial sector, Jordan

JEL Classification C33, G32, G34

INTRODUCTION

Financial distress is a key issue for firms in emerging markets. It becomes more serious when firms operate in unstable economic conditions, face limited access to finance, and work within institutional settings that reduce their ability to respond to pressure. This issue is especially important in the industrial sector, where firms typically require substantial investment, carry high fixed costs, and are more sensitive to changes in demand, production costs, and financing conditions. In Jordan, these pressures have made financial distress a serious concern for industrial firms and raised questions about why some firms remain financially stable while others become vulnerable.

Financial distress is rarely caused by a single factor. Governance quality may affect the effectiveness of monitoring and strategic decision-making within the firm. Leverage may increase repayment pressure and reduce financial flexibility. Firm performance may also reflect the firm's ability to withstand shocks and continue operating under difficult conditions. Examining these factors together provides a clearer understanding of financial vulnerability than considering each one separately.

Industry is an important contributor to the Jordanian economy in terms of production, employment, and exports. Meanwhile, production costs, energy prices, financing conditions, and competition remain pressing issues for industrial companies. The sector seems to be especially appropriate for the analysis of the determinants of financial distress.

Although governance, leverage, and firm performance have been widely discussed in previous studies, the available evidence remains fragmented, especially in the context of Jordanian industrial firms. Most prior studies examine these variables separately, while fewer studies consider how they are jointly related to financial distress. As a result, there is still limited empirical evidence on the extent to which these firm-level factors are associated with financial distress in an important sector of the Jordanian economy. Accordingly, the scientific problem addressed in this study lies in the limited evidence on whether governance quality, leverage, and firm performance are significantly associated with financial distress in Jordanian industrial firms.

1. LITERATURE REVIEW AND HYPOTHESES

Previous literature suggests that governance quality, leverage, and performance may influence financial distress, although the evidence is inconsistent and situation-specific. The literature has tended to study each of these factors individually, whereas little has been found on their joint impact in emerging markets, especially among industrial firms in Jordan. The current study is designed to fill that gap by investigating the relationship between the quality of governance, leverage, and the performance of firms in the Jordanian industrial sector and financial distress.

More recent developments in Jordan have strengthened the perception that the structure of a board could have a significant impact in restraining financial distress. Alhaddad et al. (2025) studied Jordanian listed companies and discovered that female representation on boards decreases the chances of financial distress, indicating that better board diversity can lead to higher monitoring quality and corporate resilience. The evidence is more applicable to the present study since it proves that, in the Jordanian setting, the features of governance are directly associated with the financial susceptibility of firms. Recent evidence, in an emerging-market context, also suggests the relevance of governance mechanisms in explaining financial distress.

Tran (2025) explored listed Vietnamese firms and found that the governance features are important determinants of corporate financial health. The research revealed that the frequency of board meetings, gender diversity of boards, and the presence of large boards and CEO duality enhance financial health, and the impact differs by the complexity of firms. This result reinforces the hypothesis that the quality of governance continues to be an important determinant of financial distress, though this impact might vary based on the institutional and operational nature of a firm.

The identification of factors leading to financial distress in the industrial sector has emerged as a vital issue for researchers and practitioners. Prior studies have shown the importance of corporate governance, leverage, and firm performance in a market similar to Jordan's developing market (Al-Fayoumi & Abuzayed, 2009). Good corporate governance (CG) has been viewed as a fundamental driver of firm stability and long-term growth. When studying corporate governance mechanisms in Jordan, Alodat et al. (2024) found that ownership structure significantly impacts financing choices and subsequently financial stability. An external auditor plays an important oversight role in the interest of management and stockholders in the capital market.

Several related studies have examined accounting, governance, disclosure, and firm-level outcomes in emerging-market settings. Although these studies are not all directly focused on financial distress in Jordanian industrial firms, they provide a broader contextual background for understanding how reporting practices, governance structures, and firm characteristics may be associated with stability, risk, and performance

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across different settings (Abualoush et al., 2018; Al Shawabkeh, 2024; Farooq et al., 2025; Haris et al., 2019; Jarrar & Al Shawabkeh, 2024; Qawqzeh et al., 2021; Qawqzeh & Al Zobi, 2025; Shubita, 2023, 2024; Al-alawnh et al., 2024; Algrady et al., 2025; Al-Khazaleh et al., 2024, 2025; Al-Matari, 2025; Alshdaifat et al., 2024; Alkebsee et al., 2025; Amara et al., 2025; El Shlmani et al., 2025; Sharif et al., 2025; Tarigan et al., 2019).

In the same vein, studies examined board characteristics. They focused on how well governance practices are being adopted in terms of the quality and effectiveness of governance mechanisms vis-à-vis their linkage with corporate issues such as cybersecurity risk management (Ariff et al., 2016). Following this relationship, subsequent literature has demonstrated a positive impact of intellectual capital as a distinct characteristic of corporate governance outcome, where the concept is based on sustainable development and firm performance (Anghel et al., 2018). In line with this argument, Ariff et al. (2016) attributed a larger share to the role of intellectual assets in enhancing market performance, especially among multinational corporations engaged in intensive R&D processes. In a broader industrial context, several studies demonstrated intellectual capital's positive correlation with financial performance in the case of biotech firms (Shubita, 2023; Alqsass et al., 2024). Other conclusions were drawn in the Indonesian manufacturing industry by Tarigan et al. (2019), who validated the consistent impact of intellectual capital on financial performance.

Various studies have been conducted to analyze the Jordanian financial and industrial environment, giving subtle information on firm performance. According to Mansour et al. (2025), the gender diversity on corporate boards was positively associated with a firm's performance, which reflects progressive corporate governance systems in Jordanian banks (Sharif et al., 2025). In line with these results, other elements of governance that affect the banking performance in Jordan were emphasized by Shubita, who pointed to executive compensation (Shubita, 2023). At the same time, leverage has come out as a two-sided sword that has influenced the performance of firms, as well as the stability of the economy. Shubita (2023) critically evaluated the connection between human capital and structural capital and leverage and showed that the intellectual management of capital can mitigate the risks of financial leverage. Alrawashedh and Shubita (2024) highlighted that successful companies in the digital practices show better financial performance, thus highlighting the strategic importance of digitalization.

Furthermore, Aziz and Alshdaifat (2024) and Alhasnawi et al. (2024) made the integration of ESG reporting and technology adoption their priority, which also focuses on the action of transparency in governance as a method of increasing investor trust and economic stability. Miao et al. were able to discover that there are positive correlations between internal corporate governance methods and the performance of a firm, and that corporate social responsibility (CSR) moderates these relationships (Miao et al., 2023; Mansour et al., 2023). These results help to validate the idea that companies that have strong governance and successful involvement in CSR can perform better in new markets. Taken together, the literature confirms that corporate governance, leverage management, and firm performance have a strong effect on the financial stability of industrial firms. Nevertheless, there is little research on their joint influence in Jordan's industrial sector.

This paper will help fill this gap by indirectly testing how these variables interact to cause financial distress. Financial distress has been a burning issue in the Jordanian industrial sector in recent years. This is an important sector of the national economy, and it is an important contributor to GDP, exports, and employment. However, the existing issues, including elevated production and energy prices, the inability to enter local markets, and currency variations, have increased the financial instability of industrial companies. Political and economic instability in neighboring countries has further added to these pressures, making conditions of liquidity tight and receivables delayed, especially in export-based industries.

Moreover, we take recent empirical findings on the capital structure in the emerging markets, including Mansour et al. (2024), who point out

that the decisions on the capital structure in the emerging market can be influenced by the institutional limitations, financial market flaws, and political risks in addition to the firm-specific factors. These circumstances tend to bend the traditional relevance of the Trade-Off or Pecking Order as firms tend to use financial strategies that are suboptimal, which can make them vulnerable to distress. The fact that these supplementary theoretical perspectives are introduced enables a less simplistic understanding of the results of the study and the increased conformity to the institutional realities of the Jordanian industrial sector.

Emerging markets have shown in the recent past that capital structure decisions are influenced by institutional factors and market frictions that have the potential to increase the distress risk despite governance structures seeming to be at ease. Measures of profitability are also susceptible and ineffective in forecasting short-term distress in situations where costs are rising and working capital is limited. It is the reason why we are looking at governance, leverage, and performance at the same time. This is a gap in the literature that has been documented in the region.

The purpose of this study is to investigate the interaction between governance quality and leverage and firm performance (as measured by gross margin) and the resulting financial distress of industrial firms in Jordan.

The study hypotheses are:

H1: Governance quality is significantly associated with financial distress in Jordanian industrial firms.

H1a: Board size is significantly associated with financial distress.

H1b: Board independence is significantly associated with financial distress.

H2: Leverage is positively associated with financial distress in Jordanian industrial firms.

H3: Firm performance is negatively associated with financial distress in Jordanian industrial firms.

2. RESEARCH METHOD

The concept of financial distress is treated as a binary variable, and thus, logit regression is the primary estimation technique in this study. To suit the stated aim of the study, the empirical analysis assumes a single integrated financial distress model that incorporates governance quality, leverage, and firm performance. The integrated model is estimated using 200 firm-year observations for which all variables are available simultaneously.

The analysis covers the Amman Stock Exchange industrial listed firms listed over 2014-2022, yielding 474 observations after standard data cleaning (winsorization of extreme margins and balance-sheet consistency checks). Firms with missing core variables were excluded to ensure comparability across models as follows:

The integrated empirical model is specified as follows:

$$Log_{it}\left(FD_{it}\right) = \beta 0 + \beta 1 \cdot BS_{it} + \beta 2 \cdot IND_{it} + \beta 3 \cdot LEV_{it} + \beta 4 \cdot GM_{it} + \varepsilon_{it}, \quad (1)$$

where β0 is the intercept, β1–β4 are the model coefficients, *FD* denotes financial distress, *BS* denotes board size, *IND* denotes board independence, *LEV* denotes leverage, *GM* denotes gross margin, *i* refers to the firm, *t* refers to the year, and ε denotes the error term.

The study will use the following variables:

- **Financial Distress (FD)** is defined as a firm that has negative earnings per share. which is the value of zero (0) if the firm has positive (EPS) and one (1) if the firm has negative (EPS).

$$EPS = Net\ income / Shares\ Outstanding.$$

- **Good corporate governance (GCG):** the first independent variables used in this study are independent commissioners (Ind) and board size (BS).

- **Board independence** is measured as the ratio of independent board members to total board size.

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- **Gross margin (GM)** is used as a proxy for firm performance, defined as gross profit/sales. This is because gross margin gives a more direct measure of operating performance and thus reduces the overlap of the measure of operating performance, gross margin, with the financial distress measure used in this study, which is based on net income. To minimize the effect of extreme observations, gross margin is winsorized before conducting the final regression analysis.

$$GM = Gross\ Profit/Sales.$$

Leverage as a second independent variable will be measured using the debt ratio, which equals total debt over total assets. This variable is used because companies need capital to run their business (Al Zobi & Jarah, 2023). Capital may be obtained through share issuance or loans from third parties in the form of debt. Leverage arises from the use of third-party funds in financing company operations (Alqsass et al., 2024). If the total assets of a company exceed its liabilities, it may be considered financially sound and unlikely to experience distress (Alqsass et al., 2023). On the other hand, when total liabilities exceed total assets, the company is at risk of financial distress (Al-Matari, 2025). Earnings Per Share (EPS) is used in this study as a proxy for financial difficulty because of its availability for practical investment and analysis, and it is sensitive to changes in profits. We recognize that the exclusion of liquidity and solvency measures like current ratio, debt ratio, etc., is a limitation of the EPS measurement, but the measurement represents the most fundamental performance of the business that influences the value of the firm. These were excluded due to data consistency issues, but could be useful in future research to give a fuller picture of financial distress.

The full dataset consists of 474 firm-year observations. However, the integrated logit model is estimated on 200 firm-year observations for which all model variables are jointly available. This information, previously presented in the Results section, is now placed here to ensure methodological transparency and improve the logical flow of the paper.

The dataset supporting the findings of this study is available from the corresponding author upon reasonable request.

3. RESULTS

The descriptive statistics of the study variables, following the correction to the measure of board independence and winsorization of the gross margin, are shown in Table 1. Financial distress still proves to be a binary variable, and the mean value is 0.460, meaning that a firm-year is financially distressed in almost 46% of all observations. The average size of the boards studied is 7.778, while board independence is the ratio of independent to dependent members (ranging from 0 to 1 with a mean of 0.862). There is significant variation in leverage, while gross margin is more interpretable after winsorization.

The Pearson correlation matrix for the variables

Table 1. Descriptive measures

Variable	N	Mean	Median	Std. Deviation	Minimum	Maximum
Financial distress (FD)	474	0.460	0.000	0.499	0.000	1.000
Board size (BS)	388	7.778	7.000	2.557	3.000	19.000
Board independence ratio (IND)	207	0.862	0.889	0.159	0.200	1.000
Leverage (LEV)	474	0.480	0.373	0.555	0.004	6.589
Gross margin, winsorized (GM)	429	0.089	0.136	0.416	–2.200	0.675

Table 2. Pearson correlation matrix

Variable	FD	BS	IND	LEV	GM
FD	1.000	–0.081	0.014	0.431	–0.519
BS	–0.081	1.000	0.306	–0.178	0.238
IND	0.014	0.306	1.000	–0.089	0.170
LEV	0.431	–0.178	–0.089	1.000	–0.303
GM	–0.519	0.238	0.170	–0.303	1.000

Table 3. Integrated logit regression results for financial distress

Variable	Coefficient	Std. Error	z-statistic	p-value	Odds Ratio
Intercept	–3.357	1.245	–2.696	0.007	0.035
Board size (BS)	0.078	0.085	0.913	0.361	1.081
Board independence ratio (IND)	2.341	1.321	1.772	0.076	10.393
Leverage (LEV)	3.560	1.024	3.478	0.001	35.155
Gross margin, winsorized (GM)	–9.614	1.689	–5.694	0.000	0.000

used in the integrated model is shown in Table 2. The findings reveal that financial distress has a positive relationship with leverage and a negative relationship with gross margin, and the correlations of the independent variables are not high enough to be a significant multicollinearity concern.

Model statistics:

- Estimation method: Logit
- Number of observations = 200
- Pseudo $R^2 = 0.412$
- LR test p-value < 0.001

In the final model (Table 3), both the quality of governance and leverage, as well as firm performance, are studied. The results indicate that financial distress is not statistically significantly related to board size and that financial distress is positively but not statistically significantly related to the board independence measure at the 5% level. In contrast, the effect of leverage is positive and statistically significant, meaning that companies with more leverage are more prone to financial distress. Gross margin has a strong negative correlation with financial distress, which is statistically significant, indicating that the firm's operating performance increases as its financial distress decreases. The integrated model offers a more coherent explanation of financial distress than the previous separate estimations overall.

Table 4 reports a robustness check, performed with probit regression. Signs and significance do not differ significantly from the integrated logit model, particularly in the case of leverage and gross margin. This uniformity helps to ensure the stability of the main findings and to improve the reliability of the integrated specification.

The results of the hypothesis testing indicate that H_1, which proposed that corporate governance – measured by board size and board independence – significantly affects financial distress, was not supported. The empirical findings suggest that these corporate governance variables do not have a statistically significant impact on financial distress within the sample. In contrast, H_2 was supported. The analysis confirmed that leverage has a positive and statistically significant effect on financial distress, indicating that firms with higher leverage are more likely to experience financial troubles. Similarly, H_3 was also supported. The results demonstrated that firm performance, measured by gross margin, has a negative and statistically significant effect on financial distress. This finding suggests that firms with higher gross margins are less likely to encounter financial distress.

4. DISCUSSION

The integrated model provides a better explanation of the financial distress in Jordan's industrial firms than previous separate evaluations. When governance quality, leverage, and firm performance are added together in a logit model, the governance variables lose their statistical significance, while leverage is the most important positive indicator of financial distress, and gross margin is a significant negative indicator. Governance findings are to be interpreted with care.

Table 4. Robustness check using probit regression

Variable	Logit coefficient	Logit p-value	Probit coefficient	Probit p-value
Board size (BS)	0.078	0.361	0.034	0.475
Board independence ratio (IND)	2.341	0.076	1.473	0.056
Leverage (LEV)	3.560	0.001	2.070	0.000
Gross margin, winsorized (GM)	–9.614	0.000	–5.023	0.000

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Both variables, board size and board independence, have positive coefficients but are not statistically significant in the integrated model. This indicates that the governance proxies employed in this research cannot be used to support a relationship between them and the financial distress of Jordanian industrial companies.

The leverage finding is more direct and more consistent with the previous literature. The statistically significant and positive value of the coefficient on debt ratio suggests that high leverage firms are more vulnerable to financial distress. This observation is consistent with the work of Al-Fayoumi and Abuzayed (2009), who highlighted the relevance of financing structure in a Jordanian and emerging-market context, and also with Mansour et al. (2023), who talked about the strong interrelation between capital structure and governance choices. Furthermore, Shubita (2023) emphasized the risk implications of leverage in Jordanian companies, which validates the current finding. What the present paper contributes is that in the context of Jordanian industrial companies, in particular, leverage is not just a source of financing but a significant source of financial exposure. This implies that in an industry with high fixed costs and ongoing operating obligations, over-debting seems to exacerbate distress, contrary to helping resilience.

Examining the relationship between gross margin and financial distress after winsorizing extreme values, there is a significant negative relationship. This indicates that there is a link between firm profitability and financial distress: the earlier insignificant result was more likely due to inappropriate extreme observations in the raw variable. This result is less strong than the overall evidence based on performance reported in other studies, like the one by Anghel et al. (2018) and Tarigan et al. (2019), which found a correlation between firm-level strengths and positive financial performance. Simultaneously, the current outcome aligns with the literature that indicates that earnings-based metrics are not always as effective in reflecting the immediate pressure on finances in a better way as cash-flow-related ones. On this note, both Shubita (2021a) and Shubita (2021b), and Sloan (1996), tend to agree that earnings, accruals, and profitability ratios can only paint a partial picture of a firm's condition in cases when liquidity pressure and operating cash constraints are extreme. In line with this, the current research indicates that gross margin alone is too limited to describe financial distress in the industrial sector, whereby firms can still be under financial strain despite accounting profits or small gross margins.

In general, the results confirm and enhance the past literature. The governance proxies employed in this study are statistically insignificant, while leverage is the most significant predictor of financial distress, and profitability is an important factor in extreme cases when handled appropriately. Practically, the findings suggest that managers and policymakers should focus less on formal adherence to governance regulations and more on the actual effectiveness of board supervision and the application of prudent leverage policies. Concerning further studies, the results indicate that other indicators, such as liquidity ratios, cash flow indicators, and debt-servicing variables, need to be included to give a more balanced account of financial distress in Jordanian firms.

CONCLUSION

The primary purpose of the current study is to explore the interactive relationship between government quality, leverage, and firm performance in the context of financial distress among Jordanian industrial firms through a single integrated logit model. In the present study, the influence of the interaction between governance quality, leverage, and firm performance on the financial distress of industrial firms in Jordan was examined through a single integrated logit model. The results indicate that leverage is the most positive determinant of financial distress, while gross margin is negative and significantly associated with financial distress. The governance proxies employed in this study, on the other hand, do not have statistically significant effects in the joint estimation of the variables. From a theoretical standpoint, these findings argue that financing structure and operating performance better explain financial distress in this context than the governance proxies used in this study. In practice, it means that com-

panies need to consider their leverage policy and their operating performance carefully to lower their financial vulnerability. One limitation of the study is that the integrated model is estimated based on the common observations available for all the variables and a limited set of governance proxies. The model could be extended to include further governance, liquidity, and cash-flow information and applied to other industries or emerging-market situations.

AUTHOR CONTRIBUTIONS

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