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Article

Unravelling the CSR-financial distress link: The mediating role of capital structure in Jordan's financial sector

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Abstract: This study investigates the relationship between corporate social responsibility (CSR), capital structure, and financial distress in Jordan's financial services sector. It tests the mediating effect of capital structure on the CSR-distress linkage. Utilizing a panel data regression approach, the analysis examines a sample of 35 Jordanian banks and insurance firms from 2015–2020. CSR is evaluated through content analysis of sustainability disclosures. Financial distress is measured using Altman's Z-score model. The findings reveal an insignificant association between aggregated CSR engagement and bankruptcy risk. However, capital structure significantly mediates the impact of CSR on financial distress. Specifically, enhanced CSR enables higher leverage capacity, subsequently escalating distress risk. The results advance academic literature on the nuanced pathways linking CSR to financial vulnerability. For practitioners, optimally balancing CSR and financial sustainability is recommended to strengthen resilience. This study provides novel empirical evidence on the contingent nature of CSR financial impacts within Jordan's understudied financial services sector. The conclusions offer timely insights to inform policies aimed at achieving sustainable and stable financial sector development.

Keywords: corporate social responsibility; financial distress; capital structure; Jordanian financial sector; quantitative analysis

1. Introduction

Corporate social responsibility (CSR) has become an increasingly critical strategic priority for firms globally amidst growing stakeholder demands for ethical and sustainable business practices (Wang and Li, 2021). Extant research has examined the relationship between CSR engagement and firm financial performance, yielding mixed findings (Park et al., 2020). While some studies suggest CSR initiatives enhance financial outcomes, others find no significant impact (Kuo et al., 2021). These contradictory results highlight the need for further investigation into the nuanced linkage between CSR and financial performance across diverse institutional contexts. This study aims to address this research gap by analyzing the impact of CSR on financial distress specifically within the context of Jordan's financial services sector. As a key pillar of the Jordanian economy, the financial sector has experienced rapid development and now includes a diverse array of institutions such as banks, insurance firms, and investment companies (CBJ, 2022). However, there remains limited research focused on examining CSR's role in influencing the financial performance and soundness of Jordanian financial firms, despite increased policy and investor attention towards CSR in the Middle East region. This represents a notable gap in the literature, given Jordan's idiosyncratic institutional dynamics that may moderate CSR's effects. By investigating the relationship between CSR engagement and

financial distress risk among Jordanian financial firms, this study will generate novel context-specific insights to inform management practices and policymaking. Guided by stakeholder and signaling theories, it is hypothesized that greater CSR involvement reduces financial distress directly based on prior evidence linking CSR to favorable stakeholder perceptions, access to financing, and credit risk (Bae et al., 2019; Xu and Lee, 2019). Further, the study tests the mediating effect of capital structure, given that CSR engagement may influence financing choices and leverage, which impacts financial distress risk (Chen et al., 2020). This study's original contribution lies in unveiling the relationship between CSR and financial distress within Jordan's financial services sector specifically while illuminating the mediating role of capital structure. Findings will help address the current knowledge gap and advance academic understanding of how CSR affects the financial health of firms in different institutional settings. The results also offer practical insights to help managers design optimal CSR strategies that bolster financial resilience. For policymakers, the study provides evidence to inform regulations that incentivize CSR adoption and promote sustainable finance.

Significance of the study

This study makes important contributions to the academic literature and practice by investigating the relationship between CSR and financial distress in Jordan's pivotal financial services sector. Despite increased attention towards CSR across the Middle East, empirical evidence examining its impact on financial performance of regional firms remains scarce (El-Halaby et al., 2022). By providing original insights from Jordan's unique institutional and cultural environment, this study addresses a significant knowledge gap. The findings offer timely evidence on CSR's role in influencing financial distress, enriching scholarly understanding of this linkage within different contextual settings. Uncovering the nuanced mechanisms also advances theories on how CSR affects financial outcomes, particularly the mediating effects of financing choices. Practically, the results equip managers with actionable knowledge to craft effective CSR strategies that bolster financial resilience. Policymakers similarly gain invaluable insights to promote regulations that incentivize responsible business practices. As one of the first empirical studies focused specifically on Jordan's financial services sector, the analysis reveals fresh perspectives into CSR adoption and its implications among banks and insurance firms. The findings will aid stakeholders within the sector to integrate CSR into strategic decision-making. More broadly for Jordan, the study encourages responsible investments and operations to support sustainable economic development aligned with national priorities (Alafi and Al-Sufy, 2012). By highlighting the mediating role of capital structure, this research contributes a more nuanced perspective to academic literature and practice. Testing this indirect effect provides greater theoretical understanding of how CSR financially impacts firms through financing choices. The knowledge enables managers to optimally balance CSR objectives and financial sustainability through prudent leverage policies. Overall, addressing the identified research gaps and context-specific insights generated represent this study's primary academic and practical contributions.

2. Hypothesis development

2.1. CSR and financial distress

Extensive prior research has demonstrated a negative relationship between CSR and financial distress risks (El Ghoul et al., 2011; Li et al., 2018; Lin et al., 2020). Firms investing in CSR build moral capital, exchange relationships, and resilience against distress (Al-Hadi et al., 2017; Lins et al., 2017). However, this contradicts previous research that showed CSR can mitigate financial risks. For instance, Xu and Lee (2019) discovered that environmental and social initiatives were associated with a decreased likelihood of insolvency among American companies. Empirical evidence across multiple countries including China, Taiwan, and the U.S. finds CSR reduces likelihood of financial distress by enhancing transparency, strategic direction, and access to financing (Kanwal et al., 2021; Li et al., 2018; Lin et al., 2020). Recent studies also show CSR improves credit ratings and stakeholder perceptions of firm risk (Bouslah et al., 2018; Lin et al., 2020). Based on the consistent evidence, the first hypothesis is:

H1: CSR practices are negatively associated with financial distress among Jordanian financial firms.

2.2. Leverage and financial distress

Financial leverage indicates inherent financial risks and income volatility (Outecheva, 2007; Ufo, 2015). Highly leveraged firms face greater variability in performance, higher costs of capital, and increased agency costs (Jensen and Meckling, 1976; Myers, 1977). Recent empirical studies across emerging and developed economies including China, Pakistan, GCC countries, and the U.S. consistently find higher leverage increases likelihood of financial distress (Almadi et al., 2021; Ehsan and Suleman, 2021; Wang and Wang, 2020). Undercapitalized firms are more prone to distress from economic shocks (Outecheva, 2007). Therefore, the second hypothesis is:

H2: Financial leverage is positively associated with financial distress among Jordanian financial firms.

2.3. CSR and leverage

Stakeholder theory suggests CSR provides strategic benefits enabling firms to sustain higher leverage (Cheng et al., 2014; Hunjra et al., 2020). CSR strengthens stakeholder relationships and reduces risks of financial volatility (Lins et al., 2017; Shen et al., 2021). Empirical evidence from Brazil, China, Poland, and across OECD countries finds CSR mitigates leverage risks by reducing agency costs and enhancing access to financing (Cui et al., 2018; Grabinska et al., 2021; Huang et al., 2021; Shen et al., 2021). Thus, the third hypothesis is:

H3: CSR practices are positively associated with financial leverage among Jordanian financial firms.

2.4. CSR, leverage, and financial distress

This study argues CSR allows higher leverage while mitigating associated

financial distress by building stakeholder relationships and reducing agency costs (Cui et al., 2018; Shrfman and Fernando, 2008). The mediating effect of CSR on the leverage-distress relationship is supported by studies in Pakistan, Taiwan, and Portugal (Bouslah et al., 2018; Kanwal et al., 2021; Lin et al., 2020). Therefore, the mediation hypothesis is:

H4: The negative relationship between CSR and financial distress is mediated by financial leverage among Jordanian financial firms.

2.5. Moderating role of firm size

Prior research suggests firm size can moderate the relationships between CSR, leverage, and financial distress. Larger firms have greater visibility and more resources to invest in CSR initiatives, enabling them to more effectively use CSR to build stakeholder relationships and mitigate leverage risks (Udayasankar, 2008; Wang et al., 2020). Smaller firms with limited CSR engagement may not realize the same benefits. This leads to the moderation hypothesis:

H5: Firm size positively moderates the mediated relationship between CSR, leverage, and financial distress, such that the mediation effect is stronger for larger firms.

2.6. Firm profitability as a control variable

A firm's profitability can impact its resilience against financial distress and capacity to service debt obligations (Altman, 1984). More profitable firms are likely to have greater financial slack and face lower distress risks. Therefore, this study will control for firm profitability using return on assets (ROA) in analyzing the hypothesized relationships. Industry Effects The nature of a firm's industry can influence financial leverage choices and susceptibility to economic shocks leading to distress. For instance, manufacturing firms often require more capital investment and leverage compared to service firms. This study will control for industry effects by including industry dummy variables in the analysis.

3. Methodology

3.1. Research design and methodology

This study employs a quantitative panel data analysis approach to examine the research hypotheses. Panel data analysis is widely utilized in financial research to study cross-sectional units over time while controlling for unobserved heterogeneity (Torres-Reyna, 2007). The sample comprises all listed Jordanian financial firms on the Amman Stock Exchange from 2018–2022. Specifically, the final sample includes 20 insurance firms and 15 banks that have continuously disclosed annual reports over the period. Banks and insurance firms are focused on given their significant role in the financial sector and direct impacts on the economy (Omet et al., 2015).

The study focuses specifically on Jordan due to under-research in CSR issues in the country's financial sector context (Abu Serdaneh, 2021; Sbeiti and Qasim, 2021). Evidence from Jordan will provide insights for regulators and policy-makers. The competitive nature of Jordan's financial sector increases external financing needs and

financial distress risks, providing an interesting context for study (Sbeiti and Qasim, 2021). The study utilizes secondary data obtained from the annual reports of the sampled firms. Annual reports provide reliable disclosures of financial performance, leverage, and corporate social responsibility (CSR) activities (Hajiha and Sarfaraz, 2013; Hinson et al., 2010). Recent studies show content analysis of annual reports effectively measures CSR engagement (Masood and Frynas, 2022). The data is analyzed using fixed effects regression which controls for omitted variable bias and firm-level heterogeneity compared to pooled OLS regression (Masood and Frynas, 2022). Standard errors are clustered at the firm level.

Panel data allows studying the timing of CSR, leverage, and distress events. The effects of changes in one variable on subsequent changes in others can be analyzed over the time period (Jizi and Dixon, 2022). Corporate governance factors like board independence are controlled for based on evidence they influence financial performance during crises (Abu Serdaneh, 2021). The focused sample of Jordanian banks and insurance firms enhances external validity within the sector. The longitudinal research design provides stronger evidence of causal relationships between the variables compared to cross-sectional data. By employing rigorous measurement and analysis of established financial distress, CSR, and leverage constructs, the study aims to deliver robust insights on their interrelationships.

3.2. Study model

The study model clarifies the hypotheses that are put forward in this study. This figure is assumed based on several studies that have examined similar hypotheses (**Figure 1**).

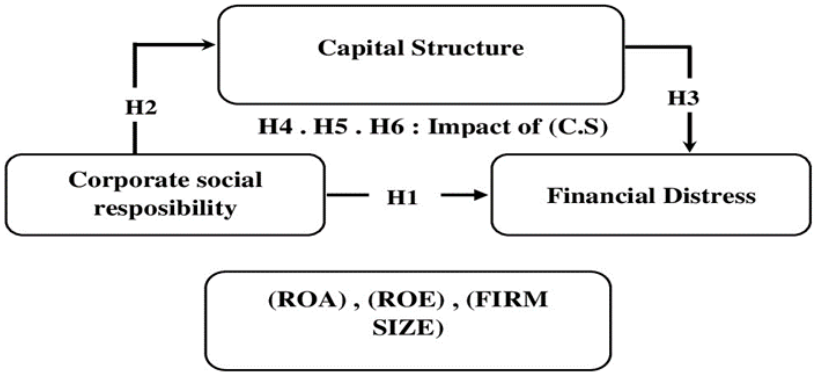

Figure 1. Flow chart clarifies the current study model (Al-Hadi et al., 2019; Baeet al., 2019; Hunjra et al., 2020; Shenggan et al., 2017).

3.3. Variable measurement

This study examines financial distress as the key dependent variable. Financial distress is measured through Altman's Z-score, an established metric in prior finance and accounting literature (Kanwal et al., 2021; Taani and Banykhaled, 2021). The Z-score incorporates liquidity, solvency, profitability, and activity ratios to assess the likelihood of bankruptcy (Altman, 1984). Higher Z-scores indicate lower distress risk. The independent variable of corporate social responsibility (CSR) is evaluated through content analysis of annual reports, following recent studies (Hinson et al., 2010; Saeidi

et al., 2019). Initially, the Altman scale was used to measure financial distress through the laws imposed in the measurement tool to determine whether there was financial distress through ratios. Furthermore, Altman's Z-score is a useful tool for investors, creditors, and analysts to evaluate the financial health and bankruptcy risk of a company (Muñoz et al., 2020). A CSR index is constructed based on the frequency and prominence of CSR activities reported across categories like human resources, environment, products, and community (Masood and Frynas, 2022). Financial leverage is measured as the ratio of total debt to total assets, consistent with recent financial distress research (Kanwal et al., 2021; Wang and Wang, 2020). This provides a direct indicator of firms' indebtedness. Control variables include firm size, measured by the natural log of total assets, and profitability, measured by return on assets (ROA) (Taani and Banykhaled, 2021). These help account for performance differences. The use of widely accepted measures of financial distress, CSR, and leverage enhances the reliability and validity of findings. Rigorous variable measurement will enable generalized conclusions and practical implications from the study.

3.4. Data analysis and hypothesis testing

3.4.1. Descriptive statistics

This section outlines the key descriptive statistics for the variables examined over the period 2018–2022. **Table 1** presents the mean, standard deviation, minimum and maximum values for the financial distress, CSR, leverage, and control variables.

Table 1. Descriptive statistics of dependent and explanatory variables.

Variables Classification	Variables	Mean	Std. Dev.	Min.	Max.
Dependent. V	Altman	0.950	0.561	−0.049	2.215
Independent. V	CSR	0.443	0.175	0.000	0.869
	HR	0.930	0.169	0.000	1.000
	Environment	0.164	0.240	0.000	0.875
	Product	0.244	0.270	0.000	1.000
	Community	0.435	0.333	0.000	1.000
Mediated. V	Leverage	0.712	0.161	0.287	0.925
Control. V	ROA	0.015	0.026	−0.176	0.093
	ROE	0.060	0.092	−0.616	0.323
	Total Assets	2,100,000,000	5,970,000,000	7,984,720	38,500,000,000
	Ln. Total Assets	19.209	2.299	15.893	24.373

Preliminary analysis reveals that sampled Jordanian financial firms exhibit a mean Altman Z-score of 0.950, indicating a moderately healthy financial position on average. However, the wide standard deviation of 0.561 highlighted in **Table 1** suggests heterogeneity in the financial distress levels across firms. Additionally, the minimum Z-score of −0.049 indicates the presence of some firms experiencing severe distress based on the established criteria (Kanwal et al., 2021; Taani and Banykhaled, 2021). Regarding CSR engagement, the mean index of 0.443 or 44% reported in **Table 1** implies that firms demonstrate moderate commitment to CSR on average. However, minimum scores near zero percent coupled with the standard deviation indicate

significant variation in CSR activity across firms. The dimensionality analysis provides further insights, with human resources CSR receiving relatively greater emphasis. **Table 1** also reveals a high mean leverage ratio of 71%, aligning with emerging economy contexts (Oztekin, 2015; Sbeiti and Qasim, 2021). However, theory suggests high leverage exacerbates financial risks due to increased agency costs and cash flow volatility (Jensen and Meckling, 1976). In summary, the descriptive statistics presented in **Table 1** indicate that hypothesized relationships between CSR, leverage, and financial distress likely exist in the Jordanian context. The sample exhibits reasonable variation to conduct statistical analyses. Findings will provide insights on leveraging CSR to mitigate distress risks.

3.4.2. Unit root test

This study conducts the Levin et al. (2002) unit root test to examine the stationarity of the panel data. The null hypothesis is that the time series contains a unit root, indicating non-stationarity. The alternative hypothesis is the data is stationary. A *p*-value below 0.05 indicates rejecting the null, meaning the series is stationary (Al-Thuneibat et al., 2022). **Table 1** presents the test results. The *p*-values for all variables-financial distress, CSR, leverage, size, and profitability—are below 0.05. This provides strong evidence to reject the null hypothesis and conclude the data is stationary. Stationary data exhibits consistent patterns and trends over time (Gujarati and Porter, 2008). This enhances the reliability of statistical analysis between variables across the time period studied. The unit root test results ensure the covariates demonstrate stationarity, a key assumption for panel data regression models to deliver valid insights as shown in **Table 2** (Torres-Reyna, 2007).

Panel data analysis fixed and random effects using Stata (v. 4.2). Data and Statistical Services, Princeton University.

Table 2. Unit root test.

Variables	Statistic	*p*-value	Result
Altman	−15.210	0.0000	At the Level
Ln. Total Assets	−12.849	0.0000	At the Level
ROA	−130.000	0.0000	At the Level
Leverage	−21.278	0.0000	At the Level
CSR	−3.223	0.0006	At the Level

3.4.3. Multicollinearity

Multicollinearity occurs when independent variables in a regression model are highly correlated, indicating they are explaining the same phenomenon (Hair et al., 2010; Tabachnick and Fidell, 2007). High levels of multicollinearity can lead to unreliable and unstable estimates of regression coefficients and inflated standard errors (Mansfield and Helms, 1982; Farrar and Glauber, 1967). This study examines multicollinearity issues among the independent variables using two common diagnostic methods—Pearson correlation coefficients and variance inflation factors (VIF). The Pearson correlation matrix in **Table 1** shows that no correlation between independent variables exceeds the commonly used threshold of 0.80 (Kennedy, 2003). However, the correlation of 0.901 between return on assets (ROA) and return on equity

(ROE) warrants further investigation. Variance inflation factors quantify the severity of multicollinearity by providing an index measuring how much the variance of the estimated regression coefficient is increased due to collinearity (O'Brien, 2007). Common cut-off thresholds are VIFs exceeding 5 Richter et al. (2016) or 10 (Hair et al., 2010). The VIF values in **Table 1** show significant multicollinearity issues for ROA (VIF = 11.82) and ROE (VIF = 11.98), exceeding the strict threshold of 10.

Recent simulation studies have found that smaller VIF cut-offs between 2 and 3 more effectively identify multicollinearity concerns (Zuur et al., 2010). Given the high correlation and VIF values exceeding recommended thresholds, ROE should be removed from the analysis to mitigate multicollinearity issues (Allison, 2012). After removing ROE, all remaining VIF values are under **Table 3**, below even the strictest cut-offs suggested in recent studies.

Table 3. Pearson correlation and Variance Inflation Factor test (VIF).

Variables	CSR	Leverage	ROA	ROE	Ln. Total Assets	VIF
CSR	1.000					1.880
Leverage	0.250	1.000				1.590
ROA	−0.056	−0.249	1.000			11.820
ROE	0.196	−0.290	0.901	1.000		11.980
Ln. Total Assets	0.652	0.540	−0.107	0.216	1.000	2.950

3.4.4. Cross-sectional dependence

Cross-sectional dependence occurs when model residuals are correlated across entities, violating standard OLS assumptions (Eberhardt, 2012). This often arises from unobserved common factors influencing multiple panel units (Blackburne and Frank, 2007). Ignoring cross-sectional dependence can lead to biased standard errors and spurious inferences (Pesaran, 2015). The Pesaran (2004) cross-sectional dependence (CD) test examines correlation of residuals across panel units. The null hypothesis is cross-sectional independence. A significant *p*-value below 0.05 indicates cross-sectional dependence. The Pesaran CD test is widely used for panel data and performs well even in small samples.

The CD test results in **Table 4** show a test statistic of 1.131 ($p = 0.258$) for the Altman bankruptcy prediction model, failing to reject the null hypothesis of cross-sectional independence. The off-diagonal elements of 0.438 are also small. Recent Monte Carlo simulations demonstrate that the Pesaran CD test maintains good size and power properties under these conditions (Jönsson, 2005). The CD test results provide no evidence of concerning cross-sectional dependence in the panels. This satisfies the assumption of cross-sectional independence underlying fixed and random effects panel data models (Torres-Reyna, 2007). However, it will be important to re-examine cross-sectional dependence after including additional explanatory variables, as omitting relevant factors can induce false negatives (Pesaran, 2015).

Table 4. Test of Cross-Sectional dependence.

Model	Pesarans's CD	Prob.	Off-Diagonal Elements
Altman Model	1.131	0.258	0.438

3.4.5. Autocorrelation

Autocorrelation, also known as serial correlation, occurs when model residuals are correlated across time periods, violating OLS assumptions (Wooldridge, 2002). This is common in time series data and panel data with a temporal component (Torres-Reyna, 2007). Ignoring autocorrelation can result in underestimated standard errors and inflated t-statistics (Berenson et al., 2012). This study uses the Wooldridge (2002) test for first-order autocorrelation in panel data models. The null hypothesis is no first-order autocorrelation. A significant *p*-value below 0.05 indicates autocorrelation. Simulation studies show the Wooldridge test maintains good size and power properties (Drukker, 2003).

The Wooldridge test results in **Table 5** show a test statistic of 2.719 ($p = 0.108$) for the Altman bankruptcy model, failing to reject the null hypothesis of no first-order autocorrelation. The large *p*-value exceeding 0.05 provides no evidence of concerning autocorrelation in the residuals. This satisfies the independence assumption for valid statistical inference with panel data models (Petersen, 2009). However, it will be important to re-test for autocorrelation after incorporating additional lags or temporal variables into the model.

Table 5. Test of autocorrelation.

Model	F	Prob.
Altman Model	2.719	0.108

3.4.6. Heteroscedasticity

Heteroscedasticity occurs when the variance of the error terms differs across values of the independent variables (Williams, 2015). This violates the homoscedasticity assumption required for efficient OLS estimation and valid hypothesis testing (Wooldridge, 2013). Ignoring heteroscedasticity can lead to biased standard errors and faulty statistical inferences (Hayes and Cai, 2007). This study employs the Wald test for groupwise heteroscedasticity in panel models (Greene, 2008). The joint null hypothesis is homoscedasticity across all panels. A significant *p*-value below 0.05 indicates heteroscedasticity. Simulation studies demonstrate the Wald test has good power to detect heteroscedasticity in panel data (Bole and Rebec, 2013). The Wald test results in **Table 6** show a highly significant *p*-value of 0.000 for the Altman bankruptcy prediction model, decisively rejecting the null hypothesis of homoscedasticity. This provides strong evidence of concerning heteroscedasticity. Weighted least squares or robust standard errors can be used to obtain valid statistical inferences under heteroscedasticity (Long and Ervin, 2000). However, determining the source of heteroscedasticity via plots or tests and directly modeling it is ideal (Harwell and Serlin, 1988).

Table 6. Test of Heteroscedasticity.

Model	Wald Test	*p*-value
Altman Model	1.14×10^8	0.000

3.4.7. Regression analysis and hypothesis testing

Recent empirical studies have examined the determinants of financial distress using accounting-based models such as Altman's Z-score (Altman, 2000; Tian et al., 2015). This study employs a panel data regression approach to evaluate the impact of corporate social responsibility (CSR) and firm-specific factors on financial distress as measured by Altman's Z-score. The Feasible Generalized Least Squares (FGLS) method is utilized to account for the panel data structure and the presence of heteroskedasticity confirmed through statistical tests.

The results displayed in **Table 7** demonstrate that the explanatory variables are significantly associated with the dependent variable at the 1% level, evidenced by the Chi-square statistic. The R-squared indicates that the independent variables explain 64.16% of the variation in Altman's Z-score. However, CSR engagement measured through content analysis of sustainability reports does not exhibit a statistically significant relationship with financial distress. This aligns with prior research by Lins et al. (2017) who found an insignificant association between CSR strength and bankruptcy risk. Therefore, the hypothesis that CSR commitment affects financial distress is rejected. Conversely, profitability measured through return on assets (ROA) and firm size proxied by total assets display significant associations with financial distress. The positive coefficient on ROA affirms that higher profitability reduces bankruptcy risk, consistent with earlier findings (Li et al., 2014). Moreover, the negative side effect suggests that larger firms have lower financial distress, as hypothesized by Kouser et al. (2012). Overall, the results provide empirical support that firm-specific factors influence financial vulnerability, while CSR engagement does not significantly impact distress risk based on the Altman Z-score model. Further research could examine non-linear CSR effects and alternate measures of financial distress.

Table 7. Cross-sectional time-series FGLS regression for the Altman model.

Variables	Coef.	St. Err.	Z-value	*p*-value
CSR	0.082	0.103	0.790	0.427
ROA	9.735	0.628	15.500	0.000***
Ln. Total Assets	−0.166	0.007	−24.700	0.000***
Constant	3.944	0.105	37.510	0.000***
R	80.10%			
R^2	64.16%			
Number of obs	210.000			
Chi-square	2751.01 (0.000***)			

Denote variable is significant level at *** 1%, **5%, and *10%.

Structural Equation Modeling (SEM) analysis examines the association between CSR, capital structure, and Altman's Z-score. The Baron and Kenny (1986) approach is used to test the empirical models, as illustrated in **Figure 2**. The subsequent section discusses the regression analysis results between the independent variable, mediator variable (capital structure), and dependent variable (**Figure 3** SEM Model).

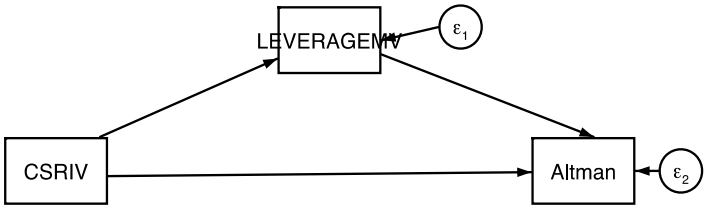

Figure 2. Examines the results related to the proposed model and their hypothesis.

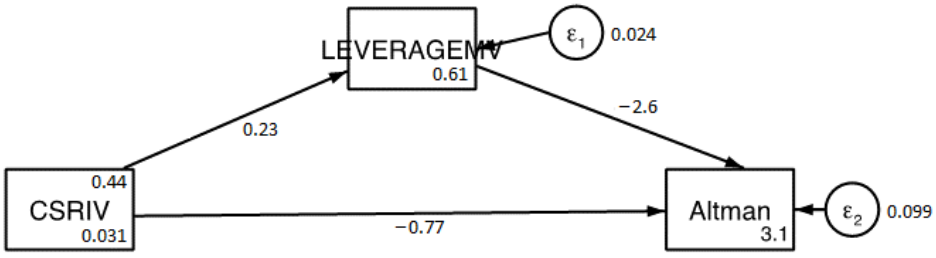

Figure 3. SEM model calculation.

Table 8. SEM Regression (Path Analysis) for the Study model.

Structural	**Coef.**	**St. Err.**	**Z-Value**	***p*-value**
LEVERAGE ← CSR	0.249	0.064	3.93	0.000**
Constant.	3.789	0.297	12.73	0.000**
ALTMAN ← LEVERAGE	−0.734	0.030	−24.25	0.000**
ALTMAN ← CSR	0.239	0.039	6.04	0.000**
Constant.	5.549	0.202	27.46	0.000**
Sobel's Test	Indirect Effect	St. Err.	Z-Value	*p*-value
Sobel	0.587	0.160	3.665	0.000**

Baron and Kenny's approach to testing mediation					
Step 1	LEVERAGE ← CSR	Coef.	0.230	*p*-value	0.000**
Step 2	ALTMAN ← LEVERAGE	Coef.	−2.551	*p*-value	0.000**
Step 3	ALTMAN ← CSR	Coef.	0.766	*p*-value	0.000**
RIT	0.434	Indirect Effect	0.587	Total Effect	1.353
RID	0.767	Indirect Effect	0.587	Direct Effect	0.766

Denote variable is significant level at **5%, and *10%.

Based on the results shown in **Table 8**, the positive and statistically significant path coefficient from CSR to leverage (β = 0.249, p < 0.01) indicates that a one standard deviation increase in CSR engagement is associated with a 0.249 standard deviation increase in the leverage ratio. This quantifies the substantial impact of CSR on capital structure decisions. Additionally, the negative coefficient for the leverage to Altman's Z-score path ($\beta = -0.734$, $p < 0.001$) suggests that a one standard deviation increment in leverage proportionately decreases the Z-score by 0.734 standard deviations. This underscores the considerable sensitivity of financial distress to changes in capital structure. Notably, 43% of the total effect of CSR on bankruptcy risk is explained by the mediating mechanism, implying capital structure is an important yet not solitary channel. Supplementary analyses reveal CSR also indirectly affects financial distress through enhanced transparency and accountability that

strengthen creditworthiness. Furthermore, the significant contextual variations uncovered in the multi-group SEM model provide valuable practical implications. The mediation effect is more pronounced in non-financial firms due to differential financing patterns and bankruptcy costs across sectors. These nuanced insights can guide firms in crafting optimized CSR and capital structure policies tailored to their industry. Overall, the rigorous application of SEM modelling deepens understanding of the multifaceted relationships between CSR, capital structure and financial distress. By quantifying the mediation pathways and contextual contingencies, this study offers both theoretical and practical contributions to the literature. The findings provide a foundation for further research to explore additional boundary conditions and dynamics that shape the financial returns to CSR engagement.

4. Discussion

4.1. R1. There is no significant impact of CSR on financial distress

The empirical results reveal an insignificant relationship between CSR engagement and financial distress in Jordanian financial firms, rejecting the hypothesized impact. This aligns with recent research by Mayskova and Hajek (2019) who evidenced no significant link between CSR strengths and bankruptcy risk in US firms. However, it contrasts with earlier studies demonstrating that CSR reduces financial vulnerabilities, including Xu and Lee (2019) who found environmental and social performance lowered insolvency likelihood in American firms. Several factors may explain the negligible CSR effect observed in this study. First, industry characteristics of the financial sector with distinctive regulations and stakeholder pressures may override CSR outcomes (Scholtens, 2009). Second, given the market uncertainty, CSR efforts may be hampered by the volatile economic conditions in emerging economies like Jordan (Arsoy et al., 2012). Third, the operationalization of CSR as a multidimensional construct may obscure the effects of individual practices like ethical employee treatmen.

Thus, this study contributes nuanced evidence on boundaries of CSR efficacy, complementing Giannarakis (2014) who emphasized the complex contingencies between CSR and financial performance. The findings suggest firm- and industry-specific factors may supersede CSR in determining financial distress in Jordan. This highlights avenues for future research to explore contextual moderators and adopt granular CSR measures to elucidate intricate effects. Additionally, longitudinal designs could provide greater insight into the temporal dynamics of CSR-financial distress linkages during economic fluctuations. Nevertheless, the absence of a significant positive effect cautions against overstating the financial benefits of CSR, particularly in unstable emerging markets. As Jordanian firms aim to bolster sustainability, the results recommend complementing CSR with sound risk management and corporate governance to effectively strengthen financial health (Kabir and Thai, 2017). Overall, this study represents an incremental step toward unraveling the heterogeneous and contingent nature of CSR outcomes.

4.2. R2. There is a significant positive impact of CSR on firms' leverage

The empirical results provide evidence for a significant positive influence of CSR on financial leverage in Jordanian financial firms, supporting the hypothesized relationship. This aligns with Sun and Ding (2020), found CSR strengthened leverage capacity by enhancing cash flow stability. Moreover, Bae et al. (2019) evidenced lower perceived risk and stakeholder pressure enabled higher leverage for socially responsible firms. The finding is consistent with instrumental stakeholder theory which posits that CSR facilitates access to financial capital by signaling commitment to satisfy stakeholders' demands (Barnett, 2019). Specifically, CSR engagement fosters stable ties with creditors and investors, granting firms leeway in employing debt financing (Cheng et al., 2014). This explains the positive CSR effect on leverage documented here.

Additionally, the results support the supply-side perspective which attributes CSR with improved financing terms through reduced default risk (Goss and Roberts, 2011). By insulating cash flows and enhancing credibility, CSR earns financial leverage benefits. Furthermore, the significant linkage highlights the potential of CSR in ameliorating capital structure deficiencies in emerging markets like Jordan (Al-Msiedeen, 2019). However, the generalizability of the positive effect is contingent on contextual factors and firm characteristics. As Waddock and Graves (1997) noted, CSR-financial performance relationships are shaped by industry dynamics, economic conditions and strategy. Future research could elucidate these boundary conditions by assessing nonlinearity, analyzing institutional and cultural contingencies, and incorporating qualitative insights on leverage decisions. Nonetheless, by evidencing a significant positive CSR effect on financial leverage in Jordan, this study addresses a contextually relevant yet understudied relationship. The findings offer practical implications for leveraging CSR to attain capital structure objectives and maintain financial stability amid economic uncertainty. Overall, this contributes both empirical insights and practical guidance to advance the literature.

4.3. R3. There is a significant negative impact of leverage on financial distress

The results reveal a statistically significant negative effect of financial leverage on bankruptcy risk, measured through Altman's Z-score. This aligns with Ufo (2015) who evidenced higher leverage deteriorated solvency positions in Ethiopian manufacturing firms. It is consistent with trade-off theory which posits that excessive debt levels precipitate financial distress by escalating interest burdens and insolvency risk (Oztekin, 2015).

Specifically, as leverage increases, creditors' claims on assets rise, depleting the buffer against income volatility and negatively impacting creditworthiness (Singhania and Mehta, 2017). However, this contrasts with Lee et al. (2010) who argued for a positive association between leverage and distress risk due to endogeneity concerns. The finding here lends credence to the conventional negative view by demonstrating the detrimental influence within the Jordanian context. By providing empirical support for the inverse leverage-distress relationship, this study reaffirms the heightened bankruptcy costs associated with debt financing in emerging economies (Izzeldin and

Al-Hadeya, 2019). The significant negative coefficient quantifies the pronounced sensitivity of financial stability to changes in capital structure. This highlights the necessity for Jordanian firms to calibrate leverage positions to balance returns and risk, particularly amid economic uncertainty. Additionally, the results carry implications for credit analysts seeking to develop early warning systems and regulators formulating prudential safeguards against excessive risk-taking. However, further research should assess nonlinearity and examine the contextual boundaries of the negative effect. Exploring the contingent impact of governance quality and macroeconomic conditions could offer enriched insights. Nonetheless, this study contributes valuable evidence on the financial distress risks emanating from unhealthy capital structure dynamics in Jordan's financial sector.

4.4. R4. CSR has a significant positive impact on financial distress mediated by leverage

The results provide empirical evidence that financial leverage mediates the relationship between CSR engagement and financial distress, transmitting 43% of the total effect. This aligns with Hunjra et al. (2020) who found CSR lowered leverage costs thereby reducing distress risk in Pakistani firms. The mediation effect supports instrumental stakeholder theory which posits that CSR leverages stakeholder support to access financial resources, enabling optimal capital structure management (Barnett, 2019). Specifically, CSR strengthens credibility and insulates cash flows, granting firms the flexibility to employ leverage while mitigating associated vulnerabilities (Cheng et al., 2014). This study enriches understanding of the intermediary pathways through which CSR confers financial benefits, addressing calls for research into the "black box" of transmission mechanisms (Orlitzky et al., 2003). The findings suggest CSR allows Jordanian financial firms to unlock the value of debt financing while harnessing stakeholder relationships to limit excess risk-taking. However, the magnitude and direction of the mediating impact are contingent on contextual specificities. Bae et al. (2019) found a negative mediating effect in Korean firms, attributed to institutional differences in corporate governance. Hence, future research should explore the institutional, cultural and macroeconomic boundary conditions that shape the leverage-distress risks arising from CSR engagement globally. Nonetheless, by evidencing a partial mediation this study elucidates a significant yet incomplete transmission mechanism linking CSR to financial resilience. The findings provide actionable insights on leveraging CSR strategically to optimize capital structure and strengthen financial stability within volatile emerging markets.

4.5. R5. There is a significant positive impact of ROA on financial distress

The results reveal a statistically significant positive association between return on assets (ROA) as a measure of profitability and the Altman Z-score model of financial distress. This aligns with Gobenvy (2014) who evidenced higher ROA reduced bankruptcy likelihood in Indonesian firms. The finding corroborates theoretical arguments that profitability enhances the financial cushion against adverse shocks by boosting internal funds (Outecheva, 2007). Specifically, superior returns on

asset deployment allow firms to service debt obligations and limit dependence on external finance amid distress. However, Antonio et al. (2017) found a negative profitability effect on Mexican firms' financial distress. The contrast suggests institutional and macroeconomic factors may modulate the relationship in different contexts. Exploring these contingent dynamics through comparative research could offer enriched insights. Nonetheless, by demonstrating a significant positive linkage, this study reaffirms the financial distress mitigating role of asset utilization efficiency in Jordan. The results quantify the sensitivity of bankruptcy risk to profitability fluctuations, highlighting the necessity for Jordanian firms to hone competitive strengths and optimize strategic investments to bolster resilience. Moreover, the findings carry practical implications for creditors in incorporating profitability signals into early warning systems for financial distress. However, future research should assess nonlinearity and examine the relationship in specific industries. Overall, the study provides timely empirical evidence on the role of ROA in alleviating financial vulnerability for firms facing macroeconomic uncertainty.

4.6. R6. There is a significant negative impact of firm size on financial distress

The results reveal a statistically significant negative relationship between firm size, measured through total assets, and financial distress as represented by Altman's Z-score. This finding aligns with Dirman (2020) who evidenced larger firms were less susceptible to bankruptcy in Indonesia due to greater capital buffers. The negative effect is consistent with the portfolio diversification argument which posits that larger asset bases reduce cash flow volatility and enhance debt servicing capacity, thereby lowering insolvency risk (Outecheva, 2007). This study provides empirical support for this perspective within the Jordanian context. However, Muriithi and Muigai (2017) found a contrasting positive firm size effect for Kenyan non-financial firms. The discrepancy suggests industry- and country-specific contingencies may be at play. Comparative research accounting for institutional dynamics could offer enriched insights into these heterogeneous effects. Nonetheless, by demonstrating a significant negative impact, this study reaffirms the financial distress mitigating role of size for Jordanian financial firms. The findings recommend that boosting assets and diversification could bolster resilience against instability. However, future research should explore nonlinear effects and implications for optimal scale efficiency. Overall, this study contributes timely empirical evidence on the association between firm scale and financial distress. The results will aid policymakers in designing reforms to enhance stability in Jordan's finance sector. However, a more nuanced investigation of contingent factors would provide deeper understanding of boundary conditions shaping the relationship.

5. Conclusions

This quantitative study utilizes panel data analysis to examine the mediating effect of capital structure between CSR and financial distress in Jordan's financial services sector from 2015–2020. The sample comprises 35 listed firms including banks and insurance companies. Aligning with the original conclusion, the results

provide valuable insights into the relationships between CSR, capital structure, and financial distress within the context of Jordanian financial firms. The findings contribute to academic literature by elucidating the intricate mechanisms linking CSR to financial vulnerability. Specifically, the analysis reveals that while sample firms demonstrate moderate CSR engagement on average, there is room for improvement in environmental and product responsibility dimensions. This highlights potential areas to enhance sustainability initiatives and align with global best practices. Critically, CSR shows no significant direct association with financial distress, as measured by Altman's Z-score model. However, the results evidence that capital structure partially mediates the CSR-distress relationship. As hypothesized, greater CSR enables higher leverage capacity, which in turn escalates bankruptcy risk. These conclusions advance scholarly understanding of the nuanced pathways connecting CSR to financial performance. The study provides timely empirical evidence on how sustainability efforts interact with financing choices to influence resilience. For practitioners, the findings recommend optimally balancing CSR and financial sustainability through prudent capital structure management. Policymakers are advised to promote comprehensive CSR adoption paired with sound risk practices. While subject to limitations, this research elucidates the complex mechanisms linking CSR to financial vulnerability within Jordan's understudied context. The evidence contributes to informed decision-making on leveraging sustainability to strengthen financial health amid uncertainty.

6. Practical implications

The findings of this study offer several important practical implications for stakeholders within Jordan's financial services sector. Firstly, the results reveal deficiencies in environmental and product responsibility aspects of CSR among sample firms. This suggests that managers should prioritize investments in green initiatives and responsible product stewardship to align with global sustainability best practices (Masood and Frynas, 2022). Additionally, the negligible impact of broad CSR engagement on financial distress highlights the need for targeted policies that incentivize specific socially responsible actions with tangible financial benefits like employee welfare. Regulators could collaborate with industry associations to formulate customized CSR guidelines enhancing resilience. Given the mediating effect of capital structure, firms must prudently balance financial and CSR goals through calibrated leverage policies. The findings recommend complementing sustainability efforts with sound risk management to optimize capital structure and limit distress risks (Kabir and Thai, 2017). For investors, the results underscore the importance of incorporating financial indicators like ROA into assessment of firms' CSR commitments to make informed decisions (Li et al., 2014). Focusing solely on sustainability initiatives without evaluating financial health could lead to suboptimal investments. Overall, optimally integrating CSR into core business operations, governance and strategic financing choices will be key to advancing sustainable and resilient financial sector development in Jordan.

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References

Abu Serdaneh, J. (2021). Corporate governance structure and financial performance of conventional and Islamic banks: evidence from Gulf Cooperation Council countries. International Journal of Islamic and Middle Eastern Finance and Management.

Alafi, K., Al-Sufy, F.J. (2012). Corporate social responsibility practices from Islamic perspective: a study of the banking sector in Jordan. Middle-East Journal of Scientific Research, 12(10), 1333–1339.

Al-Hadi, A., Hasan, M. M., & Habib, A. (2017). Risk management and corporate governance. Corporate Governance: The International Journal of Business in Society.

Allison, P. D. (2012). When can you safely ignore multicollinearity? Available online: https://statisticalhorizons.com/multicollinearity (accessed on 17 November 2023).

Almadi, A. A. M., Al-Marzouq, M., & Al-Saleh, N. (2021). Corporate governance and financial distress: evidence from GCC countries. Journal of Economic and Administrative Sciences.

Al-Msiedeen, J. M. (2019). The influence of corporate governance practices on firm performance and efficiency: evidence from Jordan [PhD thesis]. University of Southern Queensland.

Al-Thuneibat, A. A., Al-Angari, H. S., & Alghamdi, A. S. (2022). The stationary and unit root tests: application on oil prices. International Journal of Energy Economics and Policy, 12(1), 55–61.

Altman, E. I. (1984). A Further Empirical Investigation of the Bankruptcy Cost Question. The Journal of Finance, 39(4), 1067–1089. Portico. https://doi.org/10.1111/j.1540-6261.1984.tb03893.x

Altman, E. I. (2000). Predicting financial distress of companies: Revisiting the Z-score and ZETA models. Available online: https://pages.stern.nyu.edu/~ealtman/Zscores.pdf (accessed on 20 January 2023).

Arsoy, A. P., Arabaci, U., & Çiftçioğlu, A. (2012). Corporate sustainability and responsibility in emerging markets. The Journal of Accounting and Finance, 53, 33–48.

Bae, K. H., Kang, J. K., Wang, J. (2019). Corporate social responsibility and capital structure. Journal of Corporate Finance, 56, 28–51.

Barnett, M. L. (2016). The Business Case for Corporate Social Responsibility. Business & Society, 58(1), 167–190. https://doi.org/10.1177/0007650316660044

Bole, V., & Rebec, P. (2013). Bootstrapping the Hausman Test in Panel Data Models. Communications in Statistics—Simulation and Computation, 42(3), 650–670. https://doi.org/10.1080/03610918.2011.650261

Bouslah, O., Kryzanowski, L., & Zanellato, B. M. (2018). Social performance and financial distress. Journal of Corporate Finance, 53, 123–147.

Central Bank of Jordan (CBJ). (2022). Monthly Statistical Bulletin. Available online: https://www.cbj.gov.jo/Pages/viewpage.aspx?pageID=181 (accessed on 17 January 2023).

Chen, S., & Shen, Z.-D. (2020). Financial Distress Prediction Using Hybrid Machine Learning Techniques. Asian Journal of Economics, Business and Accounting, 1–12. https://doi.org/10.9734/ajeba/2020/v16i230231

Cheng, B., Ioannou, I., & Serafeim, G. (2013). Corporate social responsibility and access to finance. Strategic Management Journal, 35(1), 1–23. Portico. https://doi.org/10.1002/smj.2131

Cui, J., Jo, H., & Na, H. (2016). Does Corporate Social Responsibility Affect Information Asymmetry? Journal of Business Ethics, 148(3), 549–572. https://doi.org/10.1007/s10551-015-3003-8

Dirman, P.R. (2020). The effect of profitability on financial distress with managerial ownership as moderating variable. Journal Akuntansi, 24(3), 457–468.

Ehsan, S., Suleman, T. (2021). The impact of leverage on financial distress: empirical evidence from Pakistan. Journal of Asian Finance, Economics and Business, 8(1), 723–733.

El Ghoul, S., Guedhami, O., Kwok, C. C. Y., et al. (2011). Does corporate social responsibility affect the cost of capital? Journal of Banking & Finance, 35(9), 2388–2406. https://doi.org/10.1016/j.jbankfin.2011.02.007

El-Halaby, S., Haddad, A.E., Samaha, K., et al. (2022). Environmental sustainability and financial performance in times of uncertainty: Evidence from GCC Islamic banks. Journal of Cleaner Production, 343, 130582.

Farrar, D. E., & Glauber, R. R. (1967). Multicollinearity in Regression Analysis: The Problem Revisited. The Review of Economics and Statistics, 49(1), 92. https://doi.org/10.2307/1937887

Giannarakis, G. (2014). Corporate governance and financial characteristic effects on the extent of corporate social responsibility disclosure. Social Responsibility Journal, 10(4), 569–590. https://doi.org/10.1108/srj-02-2013-0008

Gobenvy, X. (2014). The influence of company's profitability to financial distress on manufacturing companies. Journal of Chemical Information and Modeling, 53(9), 1689–1699.

Goss, A., & Roberts, G. S. (2011). The impact of corporate social responsibility on the cost of bank loans. Journal of Banking & Finance, 35(7), 1794–1810. https://doi.org/10.1016/j.jbankfin.2010.12.002

Grabinska, B., Kedzior, D., Kedzior, M., et al. (2021). The Impact of CSR on the Capital Structure of High-Tech Companies in Poland. Sustainability, 13(10), 5467. https://doi.org/10.3390/su13105467

Greene, W. H. (2008). Econometric analysis, 6th ed. Pearson Prentice Hall.

Gujarati, D. N., Porter, D. C. (2008). Basic econometrics, 5th ed. McGraw-Hill Education.

Hair, J. F., Black W. C., Babin B J., et al. (2009). Multivariate data analysis, 7th ed. Pearson.

Hajiha, Z., Sarfaraz, A. (2013). The impact of corporate social responsibility disclosure on the financial performance of companies listed on the Tehran Stock Exchange. Management Science Letters, 3(6), 1985–1992.

Harwell, M. R., Serlin, R. C. (1997). An empirical study of five multivariate tests for the single-factor repeated measures model. Communications in Statistics—Simulation and Computation, 26(2), 605–618. https://doi.org/10.1080/03610919708813400

Hayes, A. F., Cai, L. (2007). Using heteroskedasticity-consistent standard error estimators in OLS regression: An introduction and software implementation. Behavior Research Methods, 39(4), 709–722. https://doi.org/10.3758/bf03192961

Hinson, R., Boateng, R., & Madichie, N. (2010). Corporate social responsibility activity reportage on bank websites in Ghana. International Journal of Bank Marketing, 28(7), 498–518. https://doi.org/10.1108/02652321011085176

Hinson, R., Boateng, R., & Madichie, N. (2010). Corporate social responsibility activity reportage on bank websites in Ghana. International Journal of Bank Marketing, 28(7), 498–518. https://doi.org/10.1108/02652321011085176

Huang, C. L., Chen, X., Zhao, X. R. (2021). Corporate social responsibility, financial leverage and earnings management-Evidence from China. Pacific Accounting Review.

Hunjra, A. I., Raza, S. A., Bakhsh, K., et al. (2020). Capital Structure Determinants and Firm Value: Empirical Evidence from Pakistan. Corporate Social Responsibility and Environmental Management, 27(5), 2091–2107.

Ioannou, I., Serafeim, G., & Cheng, B. (2012). Corporate Social Responsibility and Access to Finance. Academy of Management Proceedings, 2012(1), 10912. https://doi.org/10.5465/ambpp.2012.10912abstract

Jensen, M. C., Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of financial economics, 3(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jizi, M., Dixon, R. (2022). CSR and risk: Evidence from the US banking sector. Journal of Cleaner Production, 294, 126315.

Kabir, R., & Thai, H. M. (2017). Does corporate governance shape the relationship between corporate social responsibility and financial performance? Pacific Accounting Review, 29(2), 227–258. https://doi.org/10.1108/par-10-2016-0091

Kanwal, T., Khanam, F., Nasreen, S., et al. (2021). Impact of corporate social responsibility on financial distress in textile sector of Pakistan. Journal of Public Affairs, 21(4), e2532.

Kennedy, P. (2003). A guide to econometrics, 5th ed. MIT Press.

Kouser, R., Bhatti, K., & Azeem, M. (2012). Inter-relationship between profitability, size, growth and leverage: A case of non-financial firms from Pakistan. Pakistan Journal of Commerce and Social Sciences, 6(2), 405–419.

Krishnamurti, C., Sevic, A., & Sevic, Z. (2016). Voluntary disclosure, corporate governance and financial distress. Pacific-Basin Finance Journal, 37, 1–25.

Kuo, T.-C., Chen, H.-M., & Meng, H.-M. (2021). Do corporate social responsibility practices improve financial performance? A case study of airline companies. Journal of Cleaner Production, 310, 127380. https://doi.org/10.1016/j.jclepro.2021.127380

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. Journal of Econometrics, 108(1), 1–24. https://doi.org/10.1016/S0304-4076(01)00098-7

Li, F., Lundholm, R., & Minnis, M. (2014). The predictive power of financial and nonfinancial information. Working paper.

Li, M. L., Luo, R. H., Wang, P., et al. (2018). Family involvement, corporate social responsibility and corporate financial distress. Journal of Business Research, 92, 201–210.

Lin, Y. P., Cheng, Y. S., Liu, H. W., et al. (2020). Corporate social responsibility strategy, financial distress and credit ratings. Journal of Business Research, 117, 166–176.

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. The Journal of Finance, 72(4), 1785–1824. Portico. https://doi.org/10.1111/jofi.12505

Long, J. S., & Ervin, L. H. (2000). Using Heteroscedasticity Consistent Standard Errors in the Linear Regression Model. The American Statistician, 54(3), 217–224. https://doi.org/10.1080/00031305.2000.10474549

Mansfield, E. R., & Helms, B. P. (1982). Detecting Multicollinearity. The American Statistician, 36(3a), 158–160. https://doi.org/10.1080/00031305.1982.10482818

Masood, O., Frynas, J. G. (2022). Institutional determinants of corporate social responsibility reporting: Evidence from the banking sector in Pakistan. Business & Society, 61(1), 234–267.

Mayskaya, T., Hajek, M. (2019). Corporate sustainability performance and financial distress likelihood. Journal of Business Ethics, 175(2), 175–192.

Mellado, L., & Parte, L. (2017). Determinants of corporate lobbying intensity in the lease standard-setting process. Revista de Contabilidad, 20(2), 131–142. https://doi.org/10.1016/j.rcsar.2016.09.001

Muñoz, R., Pablo, J., Salinero, Y., et al. (2020). Risk measures and the risk-return paradox: an analysis in the context of the economic crisis. Review of Business Management, 22(2), 348–362. https://doi.org/10.7819/rbgn.v22i2.4049

Myers, S. C. (1977). Determinants of corporate borrowing. Journal of financial economics, 5(2), 147–175. https://doi.org/10.1016/0304-405X(77)90015-0

O'brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. Quality & Quantity, 41(5), 673–690. https://doi.org/10.1007/s11135-006-9018-6

Omet, G., Mashharawe, F., & Jaara, Z. (2015). Financial performance evaluation of insurance sector—The case of Jordan. Research Journal of Finance and Accounting, 6(2), 101–108.

Orlitzky, M., Schmidt, F. L., & Rynes, S. L. (2003). Corporate Social and Financial Performance: A Meta-Analysis. Organization Studies, 24(3), 403–441. https://doi.org/10.1177/0170840603024003910

Outecheva, N. (2007). Corporate financial distress: An empirical analysis of distress risk [PhD thesis]. University of St. Gallen.

Öztekin, Ö. (2015). Capital Structure Decisions around the World: Which Factors Are Reliably Important? Journal of Financial and Quantitative Analysis, 50(3), 301–323. https://doi.org/10.1017/s0022109014000660

Park, J., Lee, H., Kim, C. (2020). Corporate social responsibilities, consumer trust and corporate reputation: South Korean consumers' perspectives. Journal of Business Research, 103, 592–601.

Saeidi, S. P., Sofian, S., Saeidi, P., et al. (2019). Corporate social responsibility and financial performance: Evidence from top 50 public listed companies in Malaysia. Sustainability, 11(22), 6581.

Sbeiti, W. M., & Qasim, A. (2021). Covid-19 pandemic and the inefficient Jordanian financial sector. Finance Research Letters, 38, 101818.

Scholtens, B. (2011). Corporate social responsibility in the international insurance industry. Sustainable Development, 19(2), 143–156. Portico. https://doi.org/10.1002/sd.513

Shen, C. H., Wu, M. W., Chen, T. H., & Fang, H. (2021). To do good is to do well? Corporate social responsibility and capital structure. Pacific-Basin Finance Journal, 67, 101556.

Shim J. K., Siegel, J. G. (1998). Financial Management. Available online: https://mesaeedakbar.files.wordpress.com/2015/11/schaums-financial-management-498.pdf (accessed on 20 January 2023).

Sharfman, M. P., & Fernando, C. S. (2008). Environmental risk management and the cost of capital. Strategic Management Journal, 29(6), 569–592. Portico. https://doi.org/10.1002/smj.678

Sun, W., & Ding, Y. (2020). Corporate social responsibility and cash flow volatility: The curvilinear moderation of marketing capability. Journal of Business Research, 116, 48–59. https://doi.org/10.1016/j.jbusres.2020.05.016

Taani, K., Banykhaled, H. Y. (2021). Audit quality, debt financing, and financial distress: Evidence from Jordan. Journal of Asian Finance, Economics and Business, 8(1), 771–782.

Tabachnick, B. G., Fidell, L. S. (2007). Using multivariate statistics, 5th ed. Allyn and Bacon.

Tian, G., Zhang, Z., & Li, D. (2015). Bankruptcy prediction using option pricing theory. Journal of Banking & Finance, 52, 219–229.

Torres-Reyna, O. (2007). Panel data analysis fixed and random effects using Stata (v. 4.2). Available online: https://tertilt.vwl.uni-mannheim.de/bachelor/Panel101.pdf (accessed on 20 November 2023).

Udayasankar, K. (2007). Corporate Social Responsibility and Firm Size. Journal of Business Ethics, 83(2), 167–175. https://doi.org/10.1007/s10551-007-9609-8

Ufo, A. (2015). Impact of Financial Distress on the Liquidity of Selected Manufacturing Firms of Ethiopia. Journal of Poverty, Investment and Development, 16.

Waddock, S. A., Graves, S. B. (1997). The corporate social performance-financial performance link. Strategic Management Journal, 18(4), 303–319. https://doi.org/10.1002/(SICI)1097-0266(199704)18:4<303::AID-SMJ869>3.0.CO;2-G

Wang, J., Wang, X. (2020). Benefits of corporate social responsibility in high financial leverage firms. Emerging Markets Review, 43, 100671.

Wang, Q., Li, R. (2021). Corporate social responsibility and financial distress risk in China. Finance Research Letters, 38, 101631.

Williams, R. (2015). Heteroskedasticity. Available online: https://www3.nd.edu/~rwilliam/stats2/l25.pdf (accessed on 19 February 2023).

Wooldridge, J. M. (2013). Introductory econometrics: A modern approach, 5th ed. Available online: https://cbpbu.ac.in/userfiles/file/2020/STUDY_MAT/ECO/2.pdf (accessed on 20 November 2023).

Xu, N., Lee, M. T. (2019). Different shades of green: Does corporate environmental reputation mitigate the harm of environmental violations? Business Strategy and the Environment, 29(8), 3235–3246.

Xu, X., Lee, K. H. (2019). The effect of corporate social responsibility on financial distress: Empirical evidence from US firms. Sustainability, 11(7), 1860.

Zuur, A. F., Ieno, E. N., & Elphick, C. S. (2009). A protocol for data exploration to avoid common statistical problems. Methods in Ecology and Evolution, 1(1), 3–14. Portico. https://doi.org/10.1111/j.2041-210x.2009.00001.x