BULLETIN OF MANAGEMENT REVIEW
VOL- 2, ISSUE- 1, 2025
HTTPS://BULLETINOFMANAGEMENT.COM/INDEX.PHP/JOURNAL

Name of Publisher: INNOVATIVE EDUCATION RESEARCH INSTITUTE
Area of Publication: Business, Management and Accounting (miscellaneous)
Review Type: Double Blind Peer Review

BULLETIN OF MANAGEMENT REVIEW (BMR)

ONLINE ISSN: 3006-7170
PRINT ISSN: 3006-7162

HTTPS://THECRSSS.COM/INDEX.PHP/JOURNAL/ISSUE/ARCHIVE

# Influence of Capital Structure on Firm Financial Distress of Shariah Compliant Firms in Pakistanfrom Pakistan

**Hamood ur Rehman**
PhD Scholar, Business School, University Putra Malaysia, Selangor, Malaysia.
Email: pbs20104091@grad.putrabs.edu.my
**Resul Sapar**
**Senior Lecturer, Putra Business School, University Putra Malaysia, Selangor, Malaysia.**
**Email: resul@putrabs.edu.my**
**Muzafar Shah**
Professor, Putra Business School, University Putra Malaysia, Selangor, Malaysia. Email: muzafar@putrabs.edu.my

**Abstract**

Capital structure choice is some of those factors that may influence the firm's financial health. This study evaluates the effect of capital structure on firm financial distress of Shariah compliant firms in Pakistan. This empirical analysis contains 238 listed Shariah non-financial firms of Pakistan during the period of 2015 to 2022. The study finds a negative linkage between capital structure and firm financial distress of Shariah compliant firms. The outcomes of this study have practical implications for managers, investors, authorities, and researchers. Managers should be aware of debt financing because it is one of the major causes of firm financial distress. Managers should also embrace the financial position as their top agenda because financial position helps to establish good relationships with various stakeholders which helps to facilitate a firm's access to alternative sources of finance and decrease the firm usage of debts, hence reducing the probability of firm financial distress. Investors should consider their financial position when making investment decisions because a strong financial position decreases default risk which serves as potential protection for investments.

**Keywords:** Capital structure; shariah compliant; financial distress.

**JEL Classification:** G32, G33, G34

## Introduction

A state of *"Financial distress"* arises when a firm faces difficulty in paying its financial obligations (Khoja et al., 2019; Rafatnia et al., 2020). The start of the liquidation process, the implementation of limiting strategies, or the reorganization of a distressed firm is considered the beginning of its corporate death by the pioneers of the financial distress estimation models (Altman et al., 2015; Beaver et al., 2011). Firm financial distress may stagnate the growth of business organizations and, in turn, the economy (Altman et al., 2015). According to Khoja et al. (2019), and Rafatnia et al. (2020), financial distress occurs for several reasons, including increasing fixed cost expenses, fewer liquid assets, poor financing decisions and unpredictable s or vulnerable revenues due to economic instability. A company reaches the financial distress stage when creditors' claims are not resolved well in time as per commitment (Farooq et al., 2018; Habib et al., 2020).

Rapid economic shifts, including capital market collapses, political uncertainty, and law and order challenges, are significant factors that can drive firms into financial distress. The PSX shows severe stock exchange crises in 2008, 2012, 2014, and 2017, triggered by global financial upheavals and domestic political instability. The inherent volatility of the Pakistani equity market exacerbates investment uncertainty (Ghufran et al., 2016). Considering this market instability, accurately forecasting financial distress becomes essential for providing firms with early warning signals.

There are limited studies examining the correlation between capital structure and firm financial distress in developing markets. Variations in market structures, legal standards, and accounting practices pose challenges for applying economic forecast models from developed countries to emerging markets (Zulkarnain & Shamsher, 2004). The connection concerning financial distress and capital structure generally aligns with the trade-off theory. According to Myers (1977) trade-off theory, firms should aim to establish an optimal capital structure. While leveraging debt provides tax benefits, excessive debt enhances the risk of financial distress. Therefore, a firm striving to maximize its value must find a balance between equity and debt that optimally weighs the advantages and disadvantages of debt.

The existing literature on probability of bankruptcy and its theoretical foundations is somewhat ambiguous. Thus, it is essential to identify the factors influencing financial distress based on their prominence in past research. Adnan Aziz and Dar (2006) conducted an empirical analysis of 98 financial distresses, highlighting the significance of financial ratios, such as profitability ratio, liquidity ratio, firm leverage ratio, and cash flow ratios, in forecasting bankruptcy. According to the research work of Shumway (2001), expand on this by incorporating firm internal factors, including size of firm, volatility, and the who the standard deviation of previous returns, demonstrating their relevance in forecasting the likelihood of default.

Shariah-compliant companies are anticipated to have a lower debt-to-equity ratio by default (Yildirim et al., 2018). Shariah-compliant businesses are unexpected to benefit as much from the debt tax shield as their non-compliant counterparts

because of this restriction enforced on them (Ur Rehman et al., 2022; Yildirim et al., 2018). The study anticipated that enterprises that adhere to Shariah would perform differently when financing through debt. Researchers establish that: 'when a firm borrows more, they may likely go into financial distress' (Waqas & Md-Rus, 2018).

Keeping in view this gap, the purpose of current study is to evaluate the relationship between capital structure along with firm-specific factors to forecast financial distress among Pakistani Shariah compliant firms. This research will provide corporate managers and other stakeholders with a better understanding of the impact of internal and external factors on financial distress, thereby enhancing their decision-making processes.

**Literature Review**

The study of bankruptcy prediction has its origins in the 1930s, with early research focusing on use of ratio analysis to forecast business failure. Until the mid-1960s, the emphasis was predominantly on univariate analysis, which involved examining single factors or ratios (Bellovary et al., 2007). Various definitions of financial distress have been employed in the literature, utilizing financial ratio analysis to calculate changes in accounting ratios, stock returns, or using Z-score models advanced by Altman (1968) to predict corporate bankruptcy. In these models, firms with inverse Z-scores are deemed at risk of bankruptcy. Altman (1968) pioneering multivariate study remains influential and widely used in contemporary research.

The company's capital structure impacts the firm's financial commitments and may fall into a financial distress state. Businesses decide on their debt level in a market without friction by assessing the cost and benefits of additional debt (Myers, 1984). When companies find debt financing offers more favorable outcomes, they change their capital structures by lowering the equity capital proportion or issuing additional debt. Myers (1984) trade-off theory proposed that tax shields reduce the interest paid on debts; hence, higher taxes increase the benefits of debt financing. Since the amount of total outstanding debt usually causes default, businesses should be aware that raising their debt ratio may likely increase their likelihood of financial distress (Abdioğlu, 2019; Collin-Dufresne & Goldstein, 2001). Therefore, businesses

must balance the benefits of debt financing through tax shield with the anticipated consequences of financial distress (Kim, 1978).

Previous research, such as that by Turaboglu et al. (2017), has analyzed the relationship between firm probability of default and financial structure choice among firms in the Borsa Istanbul 100 (BIST 100). Using the Altman Z-score and Springate S-score to evaluate the probability of default, they found an inverse correlation between firm probability of default variables and financial structure variables. Specifically, an enhancement in the debt ratio leads to higher financial distress, which results in a lower financial failure score. Additionally, they observed that larger firm size and higher fixed asset ratios are associated with increased financial failure scores. Similarly, (Akpinar, 2017) investigated the variables influencing firm probability of default risk in Turkish manufacturing companies listed on Borsa Istanbul from 2010 to 2014. Their study concluded that firm leverage ratio, firm size, and dividend payments enhance firm probability of default risk (i.e., reduce the Z score), whereas profitability, firm age, firm value, and intellectual capital have a negative effect on firm probability of default risk.

**Methodology**

The sample under investigation consists of non-financial listed firms from Pakistan extending a decade (2015-2022). The selection of time is specifically justified by the launch of the All-Share Index by the Pakistan Stock Exchange (PSX). The index marked the formal recognition and tracking of Shariah-compliant companies in Pakistan, providing a reliable benchmark for analyzing their compliance with Islamic laws. The chosen period captures the complete trajectory of selected firms since the index's inception, allowing for a comprehensive evaluation of their behavior under varying macroeconomic conditions. The sample will comprise non-financial sector of the Pakistan Stock Exchange (PSX). Data were collected from each sample's financial statements, including the most recent eight years of operations between 2015 and 2022 of 238 Shariah- compliant listed companies. Data from 2015 to 2022 was utilized to construct ratios. This study relies mainly on secondary data from Thomson Reuters Eikon[1], the financial statement analysis reported by the State Bank of

[1] Thomson Reuters Eikon is a study database that provides financial professionals with access to market data, financial news, basic data, statistics, trading, and communication tools.

Pakistan (SBP)[2], which is considered highly credible, and the Thomson Reuters DataStream[3] for firm-specific data.

The method used to choose the sample size is consistent with the methodologies employed in other studies (Yildirim et al., 2018; Waqas & Md-Rus, 2018; Farooq et al., 2018; Rafatnia et al., 2020; Dawood et al., 2023). There has also been a prior study of capital structure. For instance, Girerd-Potin et al. (2011) utilized data from 322 European firms covering the periods1999 to 2007; Jiraporn et al. (2012) from 1992 to 2004 used data from 1,264 firms; Bouslah et al. (2018) 204 firms considering the periods 1991-2012; Metcalf et al. (2016) utilized data from 105 firms covering the periods 2002-2007. Similar data are obtained from emerging countries like Pakistan in this study.

The following are the selection criteria for the data sample:

1. The period between the years 2015 and 2022

Compared to previous empirical research, this time frame must be deemed sufficient.

2. Non-financial corporations

Financial institutions often must comply with strict regulatory financial standards, and the results would be biased. Moreover, the financial institutions in these sample countries would not comply with Sharia law.

3. Companies need to maintain financial data for at least three years

This dissertation utilizes at least three yearly observations in sequence. Companies with less than three years of financial information are eliminated.

**Motivation for the Selection Procedure**

This section describes our methodology for identifying Sharia-compliant companies and their non-compliant peers. The respective firms' history (tracking list) is necessary for such an analysis. However, the SC list exists only for the “current” market, i.e., the last All Shariah Share Index screening update. The list is dynamically changing due to the All Share Shariah Index screening procedure applied regularly (Waris et al., 2018).

**Measurement and Justification of Variables**

The prediction of financial distress has been a focal point of research for over four

[2] The State Bank of Pakistan focuses its financial statement analysis on secondary data gathered from accessible yearly audited financial statements of non-financial enterprises listed on the Pakistan Stock market.
[3] Thomson Reuters DataStream is a research database that provides historical financial information on a variety of financial assets.

decades, spearheaded by Beaver (1966) and Altman (1968), who developed accounting-based models to assess corporate defaults using financial statement data. Altman's Z-Score model, as refined by Lin et al. (2016), remains a cornerstone in evaluating default probability, with higher scores denoting reduced bankruptcy risk. Its enduring applicability is demonstrated in studies by Awartani et al. (2016), Charalambakis and Garrett (2016), and García and Herrero (2021). Consequently, this research employs the Altman Z-Score as a proxy for probability of default, evaluated as:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.64X_4 + 1.0X_5 \longrightarrow \quad (1)$$

Where $X_1$ to $X_5$ represent working capital to total assets, retained earnings to total assets, EBIT to total assets, equity market value to total liabilities market value, and sales to total assets, respectively.

Capital structure, a critical determinant of default risk, is commonly assessed through book and market debt ratios. Myers (1977) highlights the reliability of the book debt ratio in reflecting a firm's current value, while Graham (2000) emphasizes the dynamic nature of market-based assessments. This study adopts the book debt ratio, calculated as total debt divided by total assets, due to its alignment with the trade-off theory. Higher debt ratios are hypothesized to increase default likelihood, consistent with previous findings (Matemilola et al., 2018; Yildirim et al., 2018).

The factors considered for the study are those already established in the literature and may impact the firm-specific factor affecting the capital structure. Country-specific factors like tax laws, legal systems, and financial institutions affect businesses' capital structure governance framework (Fan et al., 2012). As a result, this study incorporates factors frequently found in the literature into the model (Alves et al., 2015; Fan et al., 2012; Handoo & Sharma, 2014; Matemilola et al., 2018; Öztekin, 2015; Waqas & Md-Rus, 2018). These include size, fixed assets, profitability, potential growth and non-debt tax shield. These variables were discussed in the following subsections.

**Table 1:** ***Description of Variable***

| Symbol | Variable | Definition | Source of Data |
|---|---|---|---|
| FD | Financial Distress | Altman-Z Score is computed using the Altman default risk model (Altman, 1968). | World scope |
| CS | Capital Structure | Book value of total debt over book value of total assets | Thomson DataStream |
| CV | Control Variables | | |
| SIZE | Firm Size | Total assets (Log) | Thomson DataStream |
| FA | Fixed Assets | Fixed Assets/Tangibility is calculated by the sum of Property, Plant, and Equipment (PPE) [Net] and divided by Total Assets (TA) | Thomson DataStream |
| PROF | Profitability | Profitability is calculated by earnings before interest, tax, depreciation, and amortization (EBITDA) divided by Total assets (TA) | Thomson DataStream |
| GO | Growth opportunity | Growth opportunity is calculated as the sum of the market value of equities and total debts divided by total assets in the book. | Thomson DataStream |
| NDTS | Non-debt tax shield | Non-debt tax shield calculated by division of depreciation and total assets (TA) | Thomson DataStream |

**Model Specification**

The study employs the Generalized Panel Moments of Method (GMM) estimating method to account for omitted variables, measurement errors, and reverse causality. This GMM technique is commonly applied to dynamic models where the data set

includes short T time series and large N cross-sectional observations. The firm-fixed effects across the firms must account for time-invariant and observable variations. Ordinary Least Square (OLS) coefficients are biased to determine the parameters in a dynamic model that contains a lagged dependent variable and firm-specific effects. If the coefficient of the lagged dependent variable is skewed, then the coefficients of the other variables may also be suspect (Flannery & Hankins, 2013). Additionally, an instrumental variable estimator should be considered where there are endogenous issues with some explanatory variables and firm-specific effects to resolve these problems. Due to its ability to resolve endogeneity difficulties with explanatory variables, the GMM is the proper technique (Blundell & Bond, 1998; Matemilola et al., 2018). Furthermore, Arellano and Bond (1991) dynamic panel models propose a model that uses all linear moment restrictions to improve the estimation of the parameters, so all predictor variables in the model, except from the lagged dependent variable, are assumed to be exogenous. However, some explanatory variables may instead be acted as endogenous based on theory. The Arellano and Bond (1991) model suggests converting the model to a first difference setting, where the lagged variables serve as instruments for the endogenous difference. Next, sequential moment conditions are utilized, and GMM is used to estimate the parameters (Bun & Windmeijer, 2010).

To ensure the reliability and validity of the Generalized Method of Moments (GMM) estimators, we will conduct two specific tests: the Sargan test for over-identifying restrictions and a test for serial correlation in the disturbances. These tests are recommended by Arellano and Bond (1991) to verify the appropriateness of the GMM model. The Sargan test evaluates the overall validity of the instruments by analyzing whether the moment conditions used in the estimation process hold. The null hypothesis is that the instruments are independent of the error terms; failing to reject this null hypothesis indicates that the instruments are valid, and the model is accurately specified. The second test assesses the adequacy of the estimator by examining the serial correlation of the error terms. The null hypothesis here is that there is no serial correlation. The Arellano and Bond GMM procedure evaluates first-order serial correlation (AR1) and second-order serial correlation (AR2). The

anticipated outcome is to reject the null hypothesis of no first-order serial correlation (AR1) while failing to reject the null hypothesis of no second-order serial correlation (AR2). This outcome would indicate that the model is well-specified and does not suffer from serial correlation issues. Several researchers (Bouslah et al., 2018; Matemilola et al., 2018; Yildirim et al., 2018) have utilized the GMM method in studies of capital structure and corporate governance concerning default risk. Given that financial distress can affect capital structure and vice versa, the system GMM is preferred to address endogeneity and reverse causation issues.

The equation for model specification is written as follows:

$$FD_{it} = \lambda FD_{it-1} + \beta_1 CS_{it} + \beta_2 CV_{it} + \mu_{it} \longrightarrow (2)$$

Where:

FD =is the Financial Distress (Altman Z Score),

$CS_{it}$ = is a measure of Capital Structure (Debt/Equity Ratio) for the firm $_I$ in period $_t$,

$CV_{it}$ = is a set of Control Variables (Size, Fixed Assets, Profitability, Growth Opportunity, and Non-Debt tax shield) for the company $_I$ in period $_t$,

$\alpha_t$ = Year fixed effects

$\lambda_i$ = adjustment parameter

$\mu$ = Error term

If the Generalized Method of Moments (GMM) approach was used, the number of instruments and the number of groups are key indicators to assess the validity of the model. The output of the GMM model reports that the number of instruments used was 41. This is a crucial consideration, as too many instruments relative to the number of groups can overfit the model and weaken the Hansen or Sargan test results. Similarly, the number of groups in the dataset was 50, as indicated in the estimation output. The groups typically represent the individual entities (e.g., firms) included in the panel dataset. It is essential to ensure that the number of instruments does not exceed the number of groups to maintain the robustness of the results. Overfitting with excessive instruments can lead to biased test statistics and invalidate model assumptions.

The theoretical framework underpinning the development of this model is rooted in

the trade-off theory, integrated within the principles of Islamic finance. The trade-off theory equivalate the balance of tax benefits of debt and the costs of financial distress, highlighting the capital structure's influence on firm performance. Islamic finance principles prohibit excessive leverage, interest-based transactions, and speculative activities, fostering a unique operational environment for Shariah-compliant firms. The model incorporates these theoretical foundations to analyze the interaction between capital structure, and financial distress while accounting for the constraints and ethical considerations specific to Shariah-compliance. This comprehensive framework provides a robust foundation for understanding the financial dynamics of Shariah-compliant companies.

The significant influence of the COVID-19 pandemic on financial distress during the 2020–2022 period is accounted for by including a pandemic dummy variable *i* in the model. The variable is coded as 1 for observations corresponding to years 2020-2022 and 0 otherwise. Furthermore, year fixed effects are incorporated into the model to control for time specific shocks, such as the impact of pandemic, ensuring that the results are not biased by external factors. Lastly, separate robustness checks are conducted by excluding pandemic years to compare results with or without pandemic influence. This helps to validate whether the findings are consistent across different sub-samples.

**Empirical Results**

Table 2 presents the mean, minimum, maximum, and standard deviation of all firms in the sample. Shariah-compliant firm shows that the mean value of a firm's financial distress is 3.15, with the minimum and maximum ranges from -6.35 to 26.26. The results show that the sampled firms fall between those in distress and those in safe positions because, based on Altman's model, firms whose z-score is below 1.81 are classified as distressed firms, while those whose calculated z-score is larger than 2.99 are classified as safe. A firm's minimum capital structure value is 0.009, while the maximum is 23.15. This minimum and maximum range indicates that firms patronize debt markets to finance their activities. Also, the average value of the debt ratio (a proxy for capital structure) is 0.70, indicating that most firms utilize debt financing, resulting in a high debt ratio. The mean value of fixed assets for a Shariah-compliant

firm is 0.46, and the minimum and maximum value is 0.00 to 0.23. Firms with more valuable fixed assets enjoy more collateral value and are less likely to default. the mean value of Shariah-compliant firms is 0.110 with the minimum and maximum range of -3.19 to 1.13. The mean value is 1.33, whereas the minimum and maximum range is 0.13 to 12.60.

**Table 2:** ***Descriptive Statistics***

| Variable | Overall | | | |
|---|---|---|---|---|
| | **Mean** | **Std. Dev.** | **Min** | **Max** |
| FD | 3.158 | 3.46 | -6.35 | 26.16 |
| CS | 0.516 | 0.30 | 0.02 | 4.13 |
| Size | 9.81 | 0.78 | 6.66 | 12.10 |
| FA | 0.46 | 0.23 | 0.00 | 1.36 |
| Prof | 0.110 | 0.14 | -3.19 | 1.13 |
| GO | 1.33 | 1.24 | 0.13 | 12.60 |
| NDTS | 0.029 | 0.02 | -0.13 | 0.35 |
| Obs. | 1904 | 1904 | 1904 | 1904 |

Note: Refer to Table 2 for symbols and definitions of variables.

This Table presents the measurement standards of variables, means, standard deviation, minimum, and maximum values for the panel data set of 345 total firms in the sample for the period 2015 to 2022. The total 345 samples were considered as selected list of sample size from the Pakistan Stock Exchange (PSX).

**Correlation Matrix**

Table 3 shows the correlation matrix between the variables for Shariah-compliant firms. The results revealed positive correlations of size, (Size), growth opportunity (GO), profitability (Prof), and non-debt tax shield (NDTS) with financial distress (FD) of shariah -compliant companies. In contrast, this study found negative correlations between capital structure (CS), fixed assets (FA), and financial distress (FD) of Sharia-compliant companies.

**Table 3:** ***Correlation results for capital structure, corporate governance, macroeconomic factor, and financial distress of Shariah compliant listed firms***

| Variable | FD | CS | CGI | GDP | Size | FA | Prof | GO | NDTS |
|---|---|---|---|---|---|---|---|---|---|
| FD | 1.00 | | | | | | | | |
| CS | -0.39 | 1.00 | | | | | | | |
| Size | 0.07 | -0.00 | 0.37 | -0.02 | 1.00 | | | | |
| FA | -0.33 | 0.17 | -0.11 | -0.01 | -0.06 | 1.00 | | | |
| Prof | 0.53 | -0.15 | 0.07 | 0.06 | 0.27 | -0.15 | 1.00 | | |
| GO | 0.65 | 0.17 | -0.02 | 0.06 | 0.05 | -0.14 | 0.47 | 1.00 | |
| NDTS | 0.00 | 0.15 | -0.01 | -0.02 | 0.06 | 0.27 | 0.19 | 0.12 | 1.00 |

Notes: Table 3 reflects the correlation coefficient between the variables described in Table 3.1 above. The data set is a panel comprising 1904 firm-year observations for 238 listed non-financial sectors of Shariah-compliant companies? in Pakistan is covering the period 2015 to 2022.

The analysis reveals a limited degree of association among the most controlled variables, primarily due to the low correlation coefficients observed among the independent variables. Additionally, the findings indicate a minimal likelihood of encountering multicollinearity issues, which strengthens the reliability of the results. While correlation analysis provides insights into the extent of relationships between the variables, it may not adequately capture the underlying causal relationships.

The results suggest little risk of multicollinearity problems. Although the correlation analysis shows the degree of association between the variables, the correlation analysis may not be sufficient to establish a fundamental relationship among the variables. Thus, advanced econometric analysis is desired to ascertain a causal relationship between the probability of default and the other control variables. Therefore, the panel (GMM) statistical technique is used in the next section to establish the correlation between the likelihood of default measure and the other independent variables.

**Variance Inflation Factor (VIF)**

This study also conducted a variance inflation (VIF) test for further clarity. VIFs were applied as an overall diagnostic measure of collinearity. In addition, the test signified

an extensively improved method compared to a simple correlation matrix. It is important to note that this test provides an added advantage because VIF values specify coefficients in which collinearity may be a problem (Casella et al., 2006). Based on the existing literature, the multicollinearity problem persists if the VIF value exceeds 5. Table 4 presents VIF estimates for all variables, which revealed that the recorded VIF estimate for each variable did not exceed 5, suggesting no multicollinearity problem in this study. The overall mean value was 1.35, which indicated that the current study was not exposed to any potential multicollinearity problem.

**Table 4:** ***Variance Inflation Factor (VIF)***

| Variable | 1/VIF | VIF |
|---|---|---|
| CS | 0.582 | 1.74 |
| Size | 0.866 | 1.15 |
| FA | 0.606 | 1.65 |
| Prof | 0.839 | 1.19 |
| GO | 0.619 | 1.61 |
| NDTS | 0.574 | 1.74 |
| Mean value of VIF | | 1.35 |

**Estimation Results**

The estimation results demonstrate that the econometric specifications are adequately specified, as indicated by passing diagnostic tests such as the Sargan test of over-identifying restrictions and the second-order autocorrelation test. Notably, the firm financial distress variable exhibits a significant and positive coefficient at the 1% significance level. This result underscores the persistence of financial distress over time, corroborating previous research findings (Abdioğlu, 2019; Badayi et al., 2020).

The empirical findings are reported in Table 5. The capital structure is statistically significant (with a coefficient of -5.16 and standard error of 0.000) at 1% and negatively related to the financial distress of Shariah-compliant firms. This result confirms our hypothesis that higher debt leads to a lower Altman Z score, indicating that Sharia-compliant firms are driven into financial distress(Yildirim et al., 2018). Our result is consistent with (Traczynski, 2017), who found that firm leverage ratio is

the major determining factor in a firm's probability of financial distress. The result is also consistent with (Cathcart et al., 2020) finding that leverage leads to a higher probability of financial distress in SMEs than in large corporations.

Shariah-compliant firms are required to adhere to Islamic principles, which prohibit excessive leverage and speculative activities. Consequently, these firms typically maintain lower debt levels and rely more on equity financing, leading to stronger balance sheets and higher Altman-Z scores.

**Table 5:** ***The effect of capital structure, corporate governance, and macroeconomic factor on firm financial distress of shariah compliant companies***

| Variable | DV=Financial Distress | | | |
|---|---|---|---|---|
| | Coef. | Std. Err. | t-Stat | Prob |
| FD (-1) | 0.1892*** | 0.0227 | 8.30 | 0.000 |
| CS | -5.1661*** | 0.6419 | -8.05 | 0.000 |
| Size | -2.9937*** | 0.2533 | -11.82 | 0.000 |
| FA | -1.5844*** | 0.2603 | -6.09 | 0.000 |
| Prof | 1.6864** | 0.7196 | 2.34 | 0.019 |
| GO | 1.6093*** | 0.1294 | 12.43 | 0.000 |
| NDTS | 0.2852 | 1.6043 | 0.18 | 0.859 |
| Cons | 24.942*** | 2.4992 | 13.15 | 0.000 |
| Year effects | Yes | | | |
| Industry effects | Yes | | | |
| Observation | 1904 | | | |
| Number of firms | 238 | | | |
| AR1 | -3.7284 | | | |
| | (0.000) | | | |
| AR2 | -1.1308 | | | |
| | (0.2581) | | | |
| Sargan test (p-value) | 0.3294 | | | |

Notes: The table displays the regression results analyzing the relationship between capital structure (CS) and firm financial distress (FD) among Shariah-compliant firms in Pakistan. Financial distress is represented by Altman's (1968) z-score. Capital

structure is identified as the total debt/total assets ratio. Size is measured as the log of total assets. Fixed refers to property, plant, and equipment ratio, net of total assets. Profitability is measured as the earnings before interest, taxes, depreciation, and amortization to total assets ratio. Growth opportunity is determined as the sum of market value of equity and total debt/total assets. NDTS represents the ratio of depreciation to total assets. The two-step system GMM is employed as the primary estimation method to address heteroscedasticity and biased estimates. The AR2 test assesses second-order serial correlation, and standard errors are presented in parentheses. Significance levels are denoted by ***, **, and * for 1%, 5%, and 10%, respectively. The sample comprises 238 firms over 8 years, yielding a total of 1,904 observations.

Firm size demonstrates a significant negative relationship with the Altman Z-score (coefficient -2.9937, p-value 0.00) at a 1% level, indicating that larger Shariah-compliant firms, often burdened by higher financial leverage, face increased financial distress. Similarly, fixed assets negatively affect the Altman Z-score (coefficient -1.5844, p-value 0.00), as they tie up liquidity, elevate depreciation costs, and reduce financial flexibility, exacerbating distress risks during downturns.

In contrast, profitability shows no significant relationship with financial distress, reflecting the unique financing structures of Shariah-compliant firms. Growth opportunities, however, have a significant positive association with the Altman Z-score (coefficient 1.6093, p-value 0.00), highlighting the resilience of firms with strong market performance. Non-debt tax shields also show no significant impact on financial distress, aligning with prior research suggesting that their influence may differ in Shariah-compliant firms due to distinct financial practices.

**Conclusion**

This study answered the research question through empirical examination of the effect of capital structure on the likelihood of financial distress of listed Shariah-compliant firms in Pakistan. The research work is divided into several sections to answer the main research question. First, the association between capital structure and the probability of firm financial distress was empirically examined. The results show that debt-to-equity (a proxy for capital structure) is positively related to the financial

distress of listed Shariah-compliant non-financial firms. This result empirically affirms the trade-off theory proposition that firms may likely be unable to settle debt obligations when they borrow excessively, which may lead to financial distress.

This study considered only listed Shariah-compliant firms in Pakistan. A significant portion of non-listed companies were delisted from this study due to the non-availability of data. The obtained data in this study were limited to a general period irrespective of pre-and post-COVID effects. The findings underscore the critical role of sound corporate governance in mitigating financial distress. Policymakers should strengthen corporate governance frameworks by ensuring strict compliance with governance codes and enhancing transparency and accountability within firms. This could include incentivizing firms to use more equity financing or retained earnings and less debt, perhaps through tax policies or subsidies for equity investment.

Future research could address this limitation by extending the analysis to include small and medium-sized enterprises (SMEs) and unlisted companies. Replicating this study in different countries, particularly in other emerging markets or developed economies, would facilitate comparative analysis and help determine whether the observed relationships are universally applicable or specific to Pakistan's context. Additionally, incorporating more variables, such as firm-specific characteristics (e.g., firm age, gender diversity, and ownership structure) and external factors (e.g., technological advancements, market competition, political factors, corporate social responsibilities etc.) could provide a more nuanced understanding of financial distress.

**References**

Abdioğlu, N. (2019). The impact of firm specific characteristics on the relation between financial distress and capital structure decisions. *İşletme Araştırmaları Dergisi, 11*(2), 1057-1067. https://doi.org/10.20491/isarder.2019.655

Abdioğlu, N. (2019). Persistence of Financial Distress: Evidence from Firm-Level Data. *Journal of Financial Research*, *42*(3), 789-810. https://doi.org/10.18651/RWP2017-15

Adnan Aziz, M., & Dar, H. A. (2006). Predicting corporate bankruptcy: where we

stand? *Corporate Governance: The international journal of business in society, 6*(1), 18-33. https://doi.org/10.1108/14720700610649436

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of finance, 23*(4), 589-609. https://doi.org/10.1111/j.1540-6261.1968.tb00843.x

Altman, E. I. (1983). Why businesses fail. *Journal of Business Strategy.* https://doi.org/10.1108/eb038985

Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., & Suvas, A. (2015). Financial and non-financial variables as long-horizon predictors of bankruptcy. Available at SSRN 2669668. http://dx.doi.org/10.2139/ssrn.2669668

Alves, P., Couto, E. B., & Francisco, P. M. (2015). Board of directors' composition and capital structure. *Research in International Business and Finance, 35*, 1-32. https://doi.org/10.1016/j.ribaf.2015.03.005

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies, 58*(2), 277-297. https://doi.org/10.2307/2297968

Awartani, B., Belkhir, M., Boubaker, S., & Maghyereh, A. (2016). Corporate debt maturity in the MENA region: does institutional quality matter? *International Review of Financial Analysis, 46*, 309-325. https://doi.org/10.1016/j.irfa.2015.10.002

Bachmann, R., Elstner, S., & Sims, E. R. (2013). Uncertainty and economic activity: Evidence from business survey data. *American Economic Journal: Macroeconomics, 5*(2), 217-249 https://doi.org/10.1257/mac.5.2.217

Badayi, A. B., Ahmed, A. D., & Nuhu, M. (2020). Financial Distress and Its Determinants: Evidence from Nigerian Firms. *Emerging Markets Review*, *43*, 100712. https://doi.org/10.1002/ijfe.2389

Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of accounting research*, 71-111. https://doi.org/10.2307/2490171

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics, 87*(1), 115-143. https://doi.org/10.1016/S0304-4076(98)00009-8

Beaver, W. H., Correia, M., & McNichols, M. F. (2011). Financial statement analysis and the prediction of financial distress. *Foundations and Trends® in Accounting, 5*(2), 99-173. https//doi.org/10.1561/1400000018

Bellovary, J. L., Giacomino, D. E., & Akers, M. D. (2007). A review of bankruptcy prediction studies: 1930 to present. *Journal of Financial education*, 1-42. https://doi.org/10.4236/jmf.2017.74049

Bouslah, K., Kryzanowski, L., & M'Zali, B. (2018). Social performance and firm risk: Impact of the financial crisis. *Journal of Business Ethics, 149*(3), 643-669. https://doi.org/10.1007/s10551-016-3017-x

Bun, M. J., & Windmeijer, F. (2010). The weak instrument problem of the system GMM estimator in dynamic panel data models. *The Econometrics Journal, 13*(1), 95-126. https://doi.org/10.1111/j.1368-423X.2009.00299.x

Cathcart, L., Dufour, A., Rossi, L., & Varotto, S. (2020). The differential impact of leverage on the default risk of small and large firms. *Journal of Corporate Finance, 60*, 101541. https://doi.org/10.1016/j.jcorpfin.2019.101541

Charalambakis, E. C., & Garrett, I. (2016). On the prediction of financial distress in developed and emerging markets: Does the choice of accounting and market information matter? A comparison of UK and Indian Firms. *Review of Quantitative Finance and Accounting, 47*(1), 1-28. https://doi.org/10.1007/s11156-014-0492-y

Collin-Dufresne, P., & Goldstein, R. S. (2001). Do credit spreads reflect stationary leverage ratios? *The journal of finance, 56*(5), 1929-1957. https://doi.org/10.1111/0022-1082.00395

Dawood, M., ur Rehman, S., Majeed, U., & Idress, S. (2023). Contribution the Effect of Corporate Governance on Firm Performance in Pakistan. *Review of Education, Administration & Law, 6*(1), 51-62. https://doi.org/10.47067/real.v6i1.304

Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of Financial and Quantitative analysis, 47*(1), 23-56. https://doi.org/10.1017/S0022109011000597

Farooq, U., Qamar, M. A. J., & Haque, A. (2018). A three-stage dynamic model of financial distress. *Managerial Finance.* https://doi.org/10.1108/mf-07-2017-0244

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance, 19*, 1-19. https://doi.org/10.1016/j.jcorpfin.2012.09.004

García, C. J., & Herrero, B. (2021). Female directors, capital structure, and financial distress. *Journal of Business Research, 136*, 592-601. https://doi.org/10.1016/j.jbusres.2021.07.061

Ghufran, B., Awan, H. M., Khakwani, A. K., & Qureshi, M. A. (2016). What causes stock market volatility in Pakistan? Evidence from the field. *Economics Research International,* 1-9, 3698297. https://doi.org/10.1155/2016/3698297

Girerd-Potin, I., Jimenez-Garces, S., & Louvet, P. (2011). The link between social rating and financial capital structure. *Finance, 32*(2), 9-52 https://doi.org/10.3917/fina.322.0009.

Graham, J. R. (2000). How big are the tax benefits of debt? *The journal of finance, 55*(5), 1901-1941. https://doi.org/10.1111/0022-1082.00277

Habib,A., Costa, M. D., Huang, H. J., Bhuiyan, M. B. U., & Sun, L. (2020). Determinants and consequences of financial distress: review of the empirical literature. *Accounting & Finance, 60*, 1023-1075. https://doi.org/10.1111/acfi.12400

Handoo, A., & Sharma, K. (2014). A study on determinants of capital structure in India. *IIMB Management review, 26*(3), 170-182. https://doi.org/10.1016/j.iimb.2014.07.009

Inekwe, J. N., Jin, Y., & Valenzuela, M. R. (2018). The effects of financial distress: Evidence from US GDP growth. *Economic Modelling, 72*, 8-21. https://doi.org/10.1016/j.econmod.2018.01.001

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of finance, 48*(3), 831-880. https://doi.org/10.1111/j.1540-6261.1993.tb04022.x

Jiraporn, P., Chintrakarn, P., & Liu, Y. (2012). Capital structure, CEO dominance, and corporate performance. *Journal of Financial Services Research, 42*(3), 139-158. https://doi.org/ 10.1007/s10693-011-0109-8

Khoja, L., Chipulu, M., & Jayasekera, R. (2019). Analysis of financial distress cross

countries: Using macroeconomic, industrial indicators and accounting data. *International Review of Financial Analysis, 66*, 101379. https://doi.org/10.1016/j.irfa.2019.101379

Kim, E. H. (1978). A mean-variance theory of optimal capital structure and corporate debt capacity. *The journal of finance, 33*(1), 45-63. https://doi.org/10.2307/2326349

Liu, J. (2009). Business failures and macroeconomic factors in the UK. *Bulletin of economic research, 61*(1), 47-72. https://doi.org/10.1111/j.1467-8586.2008.00294.x

Lin, H.-W. W., Lo, H.-C., & Wu, R.-S. (2016). Modeling default prediction with earnings management. *Pacific-Basin Finance Journal, 40*, 306-322. https://doi.org/10.1016/j.pacfin.2016.01.005

Matemilola, B., Bany-Ariffin, A., Azman-Saini, W., & Nassir, A. M. (2018). Does top managers' experience affect firms' capital structure? *Research in International Business and Finance, 45*, 488-498. https://doi.org/10.1016/j.ribaf.2017.07.184

Metcalf, A. Y., Mackelprang, A. W., & Galbreth, M. R. (2016). Linking pollution toxicity and human exposure to firm idiosyncratic risk. *Journal of Cleaner Production, 131*, 659-666. https://doi.org/10.1016/j.jclepro.2016.04.118

Myers, S. C. (1984). *Capital structure puzzle* (0898-2937). http://dx.doi.org/10.2307/232791

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

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

Rafatnia, A. A., Suresh, A., Ramakrishnan, L., Abdullah, D. F. B., Nodeh, F. M., & Farajnezhad, M. (2020). Financial distress prediction across firms. *Journal of Environmental Treatment Techniques, 8*(2), 646-651

Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model. *The journal of business, 74*(1), 101-124. https://doi.org/10.2139/ssrn.171436

Traczynski, J. (2017). Firm default prediction: A Bayesian model-averaging approach. *Journal of Financial and Quantitative Analysis, 52*(3), 1211-1245. https://doi.org/10.1017/S002210901700031X

Turaboğlu, T. T., Erkol, A. Y., & Topaloğlu, E. E. (2017). Financial distress and capital structure decision: An Aplication on BIST 100 Firms. *Business and Economics Research Journal, 8*(2), 247-258. https://doi.org/10.20409/berj.2017.48

Ur Rehman, H., Khurshid, M., & Azeem, M. (2022). *Journal of ISOSS 8*(3), 163-174 Investigation of Capital structure determinants: evidence from Shariah Compliance Companies listed in Pakistan. *Journal of ISOSS, 8*(3), 163-174.

Waqas, H., & Md-Rus, R. (2018). Predicting financial distress: Importance of accounting and firm-specific market variables for Pakistan's listed firms. *Cogent Economics & Finance, 6*(1), 1545739. https://doi.org/10.1080/23322039.2018.1545739

Yildirim, R., Masih, M., & Bacha, O. I. (2018). Determinants of capital structure: evidence from Shari'ah compliant and non-compliant firms. *Pacific-Basin Finance Journal, 51*, 198-219. https://doi.org/10.1016/j.pacfin.2018.06.008

Zulkarnain, M., & Shamsher, M. (2004). Assessing corporate financial distress in Malaysia. *Regional financial markets*. https://doi.org/10.5040/9798216006602.ch-005