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Ownership Structure and Leverage as Precursors to Financial Distress in an Emerging Economy: A Mediating Model

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Abstract

Purpose—This study investigates the mediating role of leverage structure in the relationship between corporate ownership composition and financial distress within an emerging economy. Given that stakeholders' influence on leverage decisions can significantly alter a firm's risk profile, we examine the specific pathways through which different ownership categories, via their leverage choices, affect the likelihood of financial distress.

Design/methodology/approach – The study examines the impact of leverage structure on the relationship between ownership structure and financial distress. A panel dataset from 2017 to 2021 in Pakistan is analyzed using the Preacher-Hayes (Preacher & Hayes, 2004) method to identify both direct and indirect pathways. Additional sensitivity analysis involves testing different methodological approaches and alternative proxies for mediating variables. Pooled OLS regression serves as the main estimation method, with PCSE (panel-corrected standard error) regression used for robustness checks.

Findings – Results show that total leverage mediates the impact of institutional ownership, insider ownership, and foreign ownership on financial distress in Pakistan. Regarding debt maturity, findings confirm that the effects of institutional and foreign ownership on financial distress are mediated by long-term leverage. Additionally, the influence of insider ownership, foreign ownership, and state ownership on financial distress is mediated by short-term leverage.

Research limitations/implications – This study focuses on an emerging economy and highlights implications of the tradeoff theory, which limits the extensive use of leverage, whether short-term or long-term.

Originality/value – This research explores the less-examined mediating role of leverage structure, which integrates both capital and debt maturity structures. Moreover, there is limited literature linking ownership structure with financial distress in both developed and developing countries. The findings provide a quantitative framework that enhances managerial decision-making by clarifying how different ownership structures, through the mechanism of leverage, impact financial risk, thereby making a significant contribution to the corporate finance literature on risk management and governance. The findings offer a granular framework for decision-makers to understand and mitigate financial risk originating from the interplay of ownership and leverage.

Keywords: Ownership structure, leverage structure, financial distress, mediation, Pooled OLS, PCSE

JEL Classifications: C51, C54, C58, G32, G34

1. Introduction

In our modern world, one of the key duties of corporate managers is to prevent financial distress (Younas, et al., 2021). Shareholders' wealth shrinks in times of severe financial difficulties (Hazami-Ammar & Gafsi, 2021). Extant literature suggests that perpetual financial distress eventually causes a business failure (Habib, et al., 2020). The primary stakeholders of a commercial enterprise are its owners. The firm needs to protect the interests of its principals as advocated by the agency theory. However, in the corporate sector, the ownership dynamics are often complex because of frequent variations in the proportions of shares owned by major shareholders (Ararat, et al., 2021). In literature, corporate ownership is categorized into concentrated ownership (OWNC), institutional ownership (INSTO), insider ownership (INSDO), government or state ownership (GOVO), and foreign ownership (FRNO). Evidence suggests that the influence of each element of ownership structure on financial distress varies (Velte, 2024). This study aims to establish a consensus on the impact of ownership structure on the financial distress of non-financial listed firms in Pakistan.

Our study also highlights the mediating role of leverage structure in the relationship between ownership structure and financial distress. Existing research has shown that leverage can serve as a mediator in different contexts, and there is little evidence explaining how leverage structure acts as a mediator between ownership structure and financial distress. Hussain, et al. (2022) suggested that leverage decisions can help reduce the risk of financial distress. Our research follows a similar approach to Xuezhou, Hussain, Hussain, et al. (2022), dividing leverage structure into capital structure and debt maturity structure. There is strong evidence of a direct connection between ownership structure and leverage structure (Tayachi, et al., 2023), as well as between leverage structure and financial distress (Paeleman, et al., 2024). The literature shows mixed results regarding the relationship between ownership components and capital structure (Mistri & Chakrabarti, 2024; Pindado & De La Torre, 2011). Additionally, there is limited evidence linking ownership structure to debt maturity (Allaya, et al., 2022). However, there is significant and somewhat less contradictory evidence supporting a direct link between leverage structure and financial distress (Rani, et al., 2020).

On the theoretical side, agency theory explains the complex relationship between shareholders and managers. Corporate owners are expected to monitor managerial decisions to ensure the company's financial health. Pecking Order Theory (POT) describes the priority of funding sources. The followers of POT prefer debt over equity financing, and each funding source has different effects on the level of financial distress. This study highlights how agency theory interacts with POT and how this interaction affects the distress of non-financial listed firms. Another contribution of the study is that it expands the understanding of POT by including the impact of leverage and debt maturity structure in the testing model.

This study is vital in the context of Pakistan for several reasons. First, corporate governance codes are relatively new and still developing in Pakistan. The last amendment was made in 2018, indicating slow progress in the evolution of corporate governance. Second, leveraged acquisitions face multiple constraints at the institutional and policy levels. This is evident from the fact that the domestic credit-to-

GDP ratio in the private sector in Pakistan was 15.4% in 2016 but decreased to 15% in 2020. In contrast, neighboring countries like India and China had ratios of 54.7% and 258.9%, respectively, in 2020. Similarly, in other South Asian countries, the ratio was 47% for Sri Lanka and 39.2% for Bangladesh, while in the United States, it was 216.2%. Additionally, the Non-Performing Loans (NPL) ratio in Pakistan was 7.9% in 2020, which is notably higher compared to India, China, and Sri Lanka, with ratios of 6.5%, 1.7%, and 4.9%, respectively (World Bank, 2020).

This study makes several distinct contributions to the literature. First, we develop and test a comprehensive mediating model that disentangles the complex pathways linking various ownership subcategories to financial distress through leverage structure. Second, we advance the traditional application of Pecking Order Theory (POT) by decomposing leverage not only into capital structure (total leverage) but also into debt maturity structure (short-term vs. long-term leverage), offering a more nuanced view of financing choices. Third, our focus on non-financial firms in an emerging market—Pakistan—provides new evidence in a context where corporate governance mechanisms are still evolving and access to credit is constrained. Finally, our study period incorporates the COVID-19 pandemic, allowing for an examination of these dynamics under unique macroeconomic stress.

The rest of the paper is organized as follows. The next section provides a review of the theory underlying the study. Section 3 presents the hypotheses along with relevant literature. Section 4 provides a detailed explanation of the methodology, including data description and the research methods employed. Section 5 presents the results and their discussion. Finally, the last section offers conclusions and discusses policy implications.

2. Literature Review and Theoretical Framework

2.1 Agency Theory

The Agency Theory suggests that owners and managers have a principal-agent relationship. Agents need to be effectively monitored to ensure they serve their principals' interests, allowing the firm to increase value and achieve its goal of maximizing shareholder wealth. As a result, corporate ownership becomes increasingly diverse. This research examines how different shareholder groups can help ensure managers make optimal financial decisions that protect the firm from financial distress, especially in a volatile and emerging economy. The theory also states that managers, acting as representatives of dispersed owners, can use financial decisions to boost firm value and reduce unwanted outcomes, such as increased financial distress.

2.2 Pecking Order Theory (POT)

An optimal capital structure is the ideal outcome of financial decisions. The Pecking Order Theory (POT) suggests that firms prefer debt over equity when seeking financing. Debt offers several benefits, including a reduction in taxes since interest is an allowable expense for calculating taxable income. The Trade-Off Theory (TOT), on the other hand, considers cost-benefit analysis to determine the optimal capital structure.

Supporters of TOT argue that if debt becomes too costly, the preference shifts toward equity. This research, like Hussain, et al. (2022), expands on the pecking order by examining the effects of leverage related to debt maturity.

2.3 Monitoring Hypothesis

The Monitoring Hypothesis suggests that a key corporate governance mechanism is the oversight of managerial decision-making. The primary stakeholders in an organization are the shareholders, who are expected to monitor and influence the agendas of managers, which form the basis of operational decisions. They can also exercise their authority during managerial appointments and attend meetings where key decisions are made. Institutional activism can help achieve organizational goals. The primary stakeholders can persuade decision-makers to act in their favor through majority consensus. They can also pressure managers to align their goals with creating higher enterprise value and stable earnings per share.

2.4 Empirical Evidence in the Pakistani Context

Table 1 in the appendix presents a summary of the research evidence relevant to our study in the context of Pakistan. Recent empirical evidence suggests that a mediating role exists for the leverage structure, and very few studies have distinguished between total leverage and debt maturity. Furthermore, several corporate governance variables impact corporate performance; however, no study has specifically linked the ownership structure to financial distress. Thus, the current study narrows this gap by examining the mediating role of leverage structure on the relationship between ownership structure and financial distress in an emerging economy.

3. Hypothesis Development

3.1 Concentrated Ownership (OWNC), Leverage Structure, and Financial Distress

Regarding the OWNC, proponents of agency theory justify the positive effects of leveraged acquisitions based on two main reasons. First, the majority shareholders limit the control of minority shareholders by taking on more debt. Second, they can implement more effective oversight of managers, as agency theory separates ownership from management. Additionally, excessive debt can serve as a tool to discipline corporate managers. On the other hand, some studies have shown that the ownership structure has negative effects on debt. Lin, et al. (2011) suggested that a large stake held by majority shareholders can hide risks and encourage risky activities, which will increase monitoring costs and credit risks faced by businesses. As a result, the cost of additional borrowing for companies seeking debt will rise. Zwiebel (1996) examined the risk-taking behavior of firms with OWNC and found that these firms tend to keep leverage low due to the risk aversion of large shareholders. However, Anderson and Reeb (2003) argued that concentrated ownership could lead firms to adopt higher leverage, as it helps key stakeholders maintain control and ultimately raises the risk of financial distress.

The literature thus presents competing views. On one hand, concentrated ownership may discipline managers and reduce agency costs through higher leverage (Anderson & Reeb, 2003). On the other hand, the risk aversion of undiversified large shareholders may lead them to prefer lower leverage to protect their private benefits of control (Lin, et al., 2011; Zwiebel, 1996). This theoretical tension suggests that the net effect of concentrated ownership on financial distress, and the role of leverage as a mediator, is not ex-ante clear and remains an important empirical question. Therefore, we propose the following hypotheses to test these pathways:

H_1: The relationship between OWNC and financial distress is significantly mediated by leverage structure,

H_{1a}: The relationship between OWNC and financial distress is significantly mediated by total leverage,

H_{1b}: The relationship between OWNC and financial distress is significantly mediated by long-term leverage, and

H_{1c}: The relationship between OWNC and financial distress is significantly mediated by short-term leverage.

3.2 Institutional Ownership (INSTO), Leverage Structure, and Financial Distress

The role of INSTO in describing the influence of leverage is twofold. One stream of research considers it as institutional activism. It explains that institutional owners have the power to exert pressure on managers in several ways. They prevent managers from manipulating earnings (Fayoumi & Abuzayed, 2010; Roodposhti & Chashmi, 2011). It also puts pressure on managers by issuing excessive debt securities. The other stream of research suggests that the costs of institutional activism and excessive monitoring can be dangerous. Overly strict administration may limit the decision-making ability of corporate managers (Flammer, et al., 2021). This can ultimately lead to increased cost issues that restrict borrowing capacity. Additionally, to benefit from pre-emptive rights issues and to increase ownership stakes, the pecking order theory may be reversed by institutional owners (Gilson & Gordon, 2013). However, both streams suggest that INSTO has significant impacts on leverage structure and financial distress. Based on this, we propose the following hypotheses:

H_2: The relationship between INSTO and financial distress is significantly mediated by leverage structure,

H_{2a}: The relationship between INSTO and financial distress is significantly mediated by total leverage,

H_{2b}: The relationship between INSTO and financial distress is significantly mediated by long-term leverage, and

H_{2c}: The relationship between INSTO and financial distress is significantly mediated by short-term leverage.

3.3 Insider Ownership (INSDO), Leverage Structure, and Financial Distress

Evidence regarding the relationship between debt and INSDO is also mixed. Many studies have shown a positive link between debt and managerial ownership (Himmelberg, et al., 1999; Rizqia & Sumiati, 2013). This positive preference for debt helps with control through majority shareholdings (Bebchuk, et al., 2000). Another line of research has reported a negative link between debt and INSDO. Pindado and De La Torre (2011) interpret this negative link as evidence of risk aversion by management, as managers diversify risk by shifting to external holdings to reduce the chance of financial distress (Jensen, et al., 1992). Recently, there is solid evidence supporting an inverted U-shaped relationship between INSDO and leverage structure (Brailsford, et al., 2002).

Based on the mixed results in the literature, we test the following hypotheses:

H_3: The relationship between INSDO and financial distress is significantly mediated by leverage structure,

H_{3a}: The relationship between INSDO and financial distress is significantly mediated by total leverage,

H_{3b}: The relationship between INSDO and financial distress is significantly mediated by long-term leverage, and

H_{3c}: The relationship between INSDO and financial distress is significantly mediated by short-term leverage.

3.4 Government or State Ownership (GOVO), Leverage Structure, and Financial Distress

Researchers advocating agency theory propose that an optimal leverage and ownership structure can reduce total agency risks, and that debt accumulation in the capital structure can influence the management team of a company (Jensen, 1986). Concerning the role of ownership structure in corporate decision-making, Shleifer and Vishny (1994) suggest that GOVO is often linked to political objectives at the expense of other stakeholders. Similarly, Stulz (1990) found that public companies tend to have more leverage, and private companies generally perform better than their public counterparts. Megginson (2017) demonstrated that GOVO has a positive correlation with leverage and firms' access to long-term debt. Huang (2006) also found that ownership structure affects capital structure, with companies holding higher government and lower institutional equity typically carrying less total debt and lower debt ratios, thereby facing reduced financial distress risk. According to Su (2010), there is strong evidence that state-controlled firms use less debt for financing, and that state ownership weakens the positive relationship between unrelated diversification and leverage. Brown, et al. (2009) found that private firms relying almost exclusively on debt financing tend to have higher leverage ratios.

In our study, we set the hypotheses below to test the leverage's role as a mediator for the impacts of GOVO on financial distress:

H_4: The relationship between GOVO and financial distress is significantly mediated by leverage structure,

H_{4a}: The relationship between GOVO and financial distress is significantly mediated by total leverage,

H_{4b}: The relationship between GOVO and financial distress is significantly mediated by long-term leverage, and

H_{4c}: The relationship between GOVO and financial distress is significantly mediated by short-term leverage.

3.5 Foreign Ownership (FRNO), Leverage Structure, and Financial Distress

There are two competing perspectives on how FRNO affects leverage structure. On one side, cross-country investors, who may have fewer business connections to firms, are involved in promoting manager oversight and governance improvements (Aggarwal, et al., 2011; Ferreira & Matos, 2008). On the other side, since the share of FRNO in emerging markets tends to be low—partly due to common home bias—it is unclear whether foreign investors, seeking global investment opportunities, can effectively monitor and improve the corporate governance of domestic firms (Das, 2014; Miyajima, et al., 2016). Nonetheless, the impact of leverage on financial distress has two facets. The agency cost theory suggests that when firms have greater borrowing capacity, managers are given more freedom (Jensen, 2003). Conversely, as borrowing increases, managers are often disciplined to reduce the risk of bankruptcy (Hotchkiss, et al., 2008). This situation worsens for firms with higher rollover risk, especially in emerging economies (Blum, 2002).

We clarify the relationships among FRNO, leverage structure, and financial distress by testing the following hypotheses:

H_5: The relationship between FRNO and financial distress is significantly mediated by leverage structure,

H_{5a}: The relationship between FRNO and financial distress is significantly mediated by total leverage,

H_{5b}: The relationship between FRNO and financial distress is significantly mediated by long-term leverage, and

H_{5c}: The relationship between FRNO and financial distress is significantly mediated by short-term leverage.

4. Materials and Methods

4.1 Data and Sample Selection

This study collected annual data for 231 non-financial firms listed on the Pakistan Stock Exchange (PSX) over five years from 2017 to 2021. The data is collected from two different sources; First, data on ownership structure is collected from annual reports of each firm. Second, data on company-specific

variables are collected from the Financial Statement Analysis (FSA) of non-financial firms published by the State Bank of Pakistan (SBP). This study focuses solely on non-financial firms, as financial firms have lower chances of financial distress due to regulatory requirements and government protections, such as maintaining liquidity, deposit insurance, and central bank support, which reduce the likelihood of financial distress. In contrast, non-financial firms lack such protective support, making them more vulnerable to liquidity issues and increasing the probability of financial distress. Therefore, this study specifically examines non-financial firms. Additionally, firms that were not operational during the study period or had missing data are excluded from the balanced panel dataset. Table 2 in the appendix provides the distribution of firms selected from each of the 14 sectors of PSX.

4.2 Variable Calibrations

4.2.1 Dependent Variable

This study uses the concept of z-score (Altman, 2005) to operationalize the dependent variable (financial distress) and construct the emerging market Z-score (EMZSCORE). The score is based on four key determinants of financial distress, represented by X_1, X_2, X_3, and X_4, as specified in the following equation:

$$EMZSCORE = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 + 3.25, \quad (1)$$

where EMZSCORE is the dependent variable that measures financial distress, a higher value represents a lower probability of financial distress, and vice versa; X_1 is a ratio of working capital to total assets; X_2 is retained earnings divided by total assets; X_3 is operating income divided by total assets; and X_4 is the ratio of the book value of equity to total liabilities.

4.2.2 Explanatory Variables

In this study, the independent variable is the corporate ownership structure, which consists of five elements: OWNC, INSTO, INSDO, GOVO, and FRNO. OWNC refers to the percentage of shares held by the five largest shareholders (Crisóstomo & Freire, 2015). A high OWNC value indicates that most of the stock ownership is concentrated in the hands of a few individuals who can influence the decision-making process within the organization. INSTO represents the percentage of shares held by institutional investors (Ferreira & Matos, 2008; Thomsen & Pedersen, 2000). INSDO, also known as managerial ownership, shows the percentage of shares owned by managers (Al-Fayoumi, et al., 2010; Widhiadnyana & Ratnadi, 2019). GOVO represents the percentage of government ownership in the enterprise (Huang, et al., 2018), and FRNO refers to the percentage of shares owned by foreign investors (Das, 2014; Miyajima, et al., 2016).

4.2.3 Mediating Variables

Following Hussain, et al. (2020), this study examines the mediating role of leverage structure using three different measures. The first measure is the ratio of total debt to total assets of an individual firm, denoted

as TDTA (Yahya & Hidayat, 2020). The second measure is the ratio of long-term debt to total assets, denoted as LTDTA (Adil, et al., 2024). In order to account for a preference toward short-term debt (Mboi, et al., 2018), the third measure, the ratio of short-term debt to total assets, denoted as STDTA, is calculated. Therefore, total, long-term, and short-term debts are considered in proportion to total assets.

4.2.4 Control Variables

This study includes six control variables. The first control variable is the current ratio (CR) used to control for the impact of liquidity on financial distress (Angsoyiri & Ativor, 2021; Siah & Ting, 2023). CR is the ratio of current assets to current liabilities (Firmansyah & Maharani, 2021). The second control variable is profitability, measured as return on assets (ROA) (Saputra, 2022; Zurriah, 2021). The third control variable is asset tangibility (AT), which is a form of collateral that helps maintain healthy leverage and avoid bankruptcy or financial distress. AT has an inverse relationship with cash reserves (AL-Gharaibeh, et al., 2024) and is measured as the ratio of fixed assets to total assets (İltaş & Demirgüneş, 2020). The fourth control variable is size (SIZE), measured by the logarithm of total assets (Dang, et al., 2018). The fifth control variable is asset growth (AG), calculated as the growth rate of assets, defined as the ratio of the current asset value to its lagged value (Cooper, et al., 2008). Lastly, it is important to note that our dataset covers a period during which the economy—and firms' operational and financial capabilities—were influenced by COVID-19 (Hoang, et al., 2022; Shukla, et al., 2024). A dummy variable is created, taking the value '1' during the COVID-19 period and '0' otherwise. Table 3 in the appendix provides a summary of the variables under study in our proposed models, along with their expected and actual impacts on financial distress.

4.3 Econometric Models

Following Ramli and Nartea (2016), this study aims to examine the mediating role of leverage structure. To investigate this relationship, we employ the three-step mediation analysis framework proposed by Preacher and Hayes (2004). Many studies in the corporate finance literature have employed mediation analysis to examine, for example, the role of corporate social responsibility in the relationship between institutional ownership and corporate tax avoidance (Dakhli, 2022), the role of corporate board characteristics in the relationship between ownership structure and corporate performance (Rashid, 2020), the effect of intellectual capital on the relationship between corporate governance and corporate performance (Shahwan & Fathalla, 2020), the role of research and development investment on the relationship between managerial ownership and financial distress (Shan, et al., 2024), and the effect of firm efficacy on the relationship between controlling shareholdings and firm performance (Ting, et al., 2024). The above papers adopt regression models to examine the mediating effect. This approach allows us to systematically assess the direct and indirect pathways through which corporate ownership structure impacts financial distress. The analysis proceeds as follows:

Step 1: The Direct Effect of Ownership Structure on Financial Distress

The first step examines the total effect of the core explanatory variables (ownership structure) on the dependent variable (financial distress) while controlling for other factors. This establishes the baseline relationship (the 'c' path in mediation terminology). The model is specified as:

$$EMZSCORE_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 CR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 AT_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} AG_{i,t} + \beta_{11} COVID_{i,t} + \varepsilon_{i,t}; \quad (2)$$

In regression equation (2), a significant coefficient on an ownership variable would suggest a direct influence on financial distress, before considering any mediating relationship.

Step 2: The Effect of Ownership Structure on the Mediators

The second step determines the relationship between the core explanatory variables (ownership structure) and the proposed mediating variables (leverage structure). This step examines whether different ownership types are systematically associated with varying levels of leverage. Therefore, we employ three separate models, one for each measure of leverage: total leverage (TDTA), long-term leverage (LTDTA), and short-term leverage (STDTA).

$$TDTA_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 CR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 AT_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} AG_{i,t} + \beta_{11} COVID_{i,t} + \varepsilon_{i,t}; \quad (3)$$

$$LTDTA_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 CR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 AT_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} AG_{i,t} + \beta_{11} COVID_{i,t} + \varepsilon_{i,t}; \quad (4)$$

$$STDTA_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 CR_{i,t} + \beta_7 ROA_{i,t} + \beta_8 AT_{i,t} + \beta_9 SIZE_{i,t} + \beta_{10} AG_{i,t} + \beta_{11} COVID_{i,t} + \varepsilon_{i,t}. \quad (5)$$

For mediation to be plausible, the ownership variables must significantly predict the leverage variables in these models.

Step 3: The Combined Effect with the Mediator

The final step involves regressing the dependent variable (financial distress) on both the core explanatory variables (ownership structure) and the mediating variable (leverage structure). This step determines whether the leverage structure significantly mediates the relationship between ownership structure and financial distress, while controlling for other explanatory variables, and whether the effect of other explanatory variables is diminished.

$$EMZSCORE_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 \boldsymbol{TDTA}_{i,t} + \beta_7 CR_{i,t} + \beta_8 ROA_{i,t} + \beta_9 AT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} AG_{i,t} + \beta_{12} COVID_{i,t} + \varepsilon_{i,t}; \quad (6)$$

$$EMZSCORE_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 \boldsymbol{LTDTA}_{i,t} + \beta_7 CR_{i,t} + \beta_8 ROA_{i,t} + \beta_9 AT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} AG_{i,t} + \beta_{12} COVID_{i,t} + \varepsilon_{i,t}; \quad (7)$$

$$EMZSCORE_{i,t} = \alpha + \beta_1 OWNC_{i,t} + \beta_2 INSTO_{i,t} + \beta_3 INSDO_{i,t} + \beta_4 GOVO_{i,t} + \beta_5 FRNO_{i,t} + \beta_6 \boldsymbol{STDTA}_{i,t} + \beta_7 CR_{i,t} + \beta_8 ROA_{i,t} + \beta_9 AT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} AG_{i,t} + \beta_{12} COVID_{i,t} + \varepsilon_{i,t}, \quad (8)$$

where i represents non-financial enterprise i in the panel, t = 1, …, T. Also, α, β and $\varepsilon_{i,t}$ represent the intercept, the coefficient for each variable, and the error term, respectively. The dependent variable in this study is EMZSCORE, which serves as a proxy for financial distress and is computed using Altman's (2005) emerging-market Z-score. A higher EMZSCORE indicates a lower likelihood of financial distress. The explanatory variables capture the firm's ownership structure, including OWNC (ownership concentration) measures the percentage of shares held by the top five shareholders; INSTO (institutional ownership) reflects the proportion of shares owned by institutional investors; INSDO (insider ownership) denotes the share of equity held by managers and directors; GOVO (government ownership) records the share owned by the state, and FRNO (foreign ownership) represents the percentage of shares held by foreign investors. The mediating variables describe the firm's leverage structure, including TDTA (total leverage), which is the ratio of total debt to total assets; LTDTA (long-term leverage), which is the ratio of long-term debt to total assets; and STDTA (short-term leverage), which is the ratio of short-term debt to total assets. The analysis also controls for a set of firm-level characteristics, including CR (current ratio) as a measure of liquidity, ROA (return on assets) as an indicator of profitability, AT (asset tangibility) defined as the ratio of fixed assets to total assets, SIZE (firm size) expressed as the natural logarithm of total assets, AG (asset growth) capturing the annual growth rate of total assets, and COVID, a dummy variable that takes the value 1 for the years 2020 and 2021 and 0 otherwise, to account for the potential impact of the pandemic.

5. Results and Discussion

5.1 Data Diagnostics

This section provides important preliminary diagnostic statistics and empirical results to examine the relationship between ownership structure, leverage structure, and financial distress. Preliminary diagnostic statistics include descriptive statistics, pairwise correlations, and multicollinearity diagnostics (see Table 4 in the Appendix), whereas the empirical analysis includes mediation analysis.

The descriptive statistics indicate no unusual values, suggesting that the dataset is suitable for further regression analysis. The pairwise correlation values for the independent variables are all smaller than 0.5. However, the correlation between liquidity and financial distress is significant and negative (-0.914). The high correlation value may be due to high multicollinearity among the independent variables. Studenmund (2014) reported that a VIF value above 10 points indicates high multicollinearity. We calculated the variance inflation factor (VIF) to detect multicollinearity. The finding shows that VIF values are below 10 for all variables. Hence, there is no multicollinearity issue in our proposed models.

Additionally, we employ Choi's (2001) panel unit root tests to check the stationarity of the variables. It is important because if variables are non-stationary, the regression results would be spurious, leading to inaccuracy in accepting/rejecting the proposed hypotheses.

The main idea is to combine p-values from an underlying unit root test applied to each group in the panel data to formulate combination unit root tests. The combination unit root tests include the inverse χ^2, inverse normal, and logit tests, which assume a finite number of groups in the panel, in addition to the modified inverse χ^2 test, which assumes an infinite number of groups. We use the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) unit root tests as the underlying unit root tests. Table 5 in the appendix reports the results. All combination tests significantly reject the null hypothesis of a unit root, stating that all data series in level are stationary. The results indicate that Equations (2) - (8) can be estimated reliably without spurious results.

5.2 Mediation Analysis

To determine the mediating role of leverage structure on the relationship between ownership structure and financial distress, we employ pooled OLS regression to estimate Equations (2) – (8). In this study, the ownership structure is categorized into five different types, and for each type, we apply a three-step mediating regression framework (Steps 1, 2, and 3).

The results of the mediation analysis in Table 6 (in the appendix) demonstrate how corporate ownership structure influences financial distress, with total leverage as a mediating variable. We conducted the Cook–Weisberg test to check for heteroscedasticity in the error terms, which could lead to underestimating the intercept and overestimating the slope coefficients (Mateus, et al., 2015). Significant Cook-Weisberg statistics indicate heteroscedasticity in all models. To correct this, we used robust standard errors for statistical inference.

Our primary results in Table 6 (in the appendix) indicate that OWNC has a negative but statistically insignificant impact on EMZSCORE in Step-1 and a positive impact on total leverage, although it remains insignificant in the Step-2 regression (Su, et al., 2025). However, total leverage shows a negative and significant impact on EMZSCORE in the Step-3 regression, suggesting that companies with high leverage are more likely to default (low EMZSCORE value) (Gultekin & Sayilgan, 2021). These findings are consistent across all ownership structures. Therefore, total leverage does not mediate the relationship between ownership structure and financial distress.

For INSTO, the direct effect on financial distress is insignificant. However, INSTO's effect on total leverage is positive and statistically significant ($\beta = 0.141$, p-value = 0.03). Both the indirect effects via Step-2 and Step-3 regressions are significant, indicating that INSTO has a positive influence on total leverage, which in turn increases the likelihood of financial distress, as reflected by a lower EMZSCORE (Kalash, 2021; Nguyen, 2021). These findings support the 'institutional activism' hypothesis, where institutional investors put pressure on firms to adopt higher leverage, potentially as a disciplinary mechanism. However, this strategy is costly, as high leverage serves as a significant channel that increases

the firm's probability of financial distress. The mediation analysis suggests that the influence of institutional ownership on financial risk operates primarily through its impact on the firm's capital structure. Similarly, INSDO also has a significant positive effect on total leverage (Rizqia & Sumiati, 2013). As previously discussed, higher leverage raises the probability of financial distress, demonstrating the mediating role of total leverage in the relationship between INSDO and financial distress.

Like OWNC, there is no mediating role for total leverage, whether partial or full, regarding GOVO's influence on financial distress. Lastly, FRNO has a significant and positive effect on the likelihood of financial distress when total leverage is taken into account. However, FRNO can also lower total leverage, which in turn leads to a reduced probability of financial distress (reflected in a higher EMZSCORE). Adil, et al. (2025) also suggest a negative impact of foreign ownership on leverage. There is strong evidence that increased leverage contributes to greater financial distress, and vice versa (Kalash, 2021; Rahman, 2010).

Tables 7 and 8 show the mediating effects of long-term and short-term leverage in examining how leverage structure affects the likelihood of non-financial firms facing financial distress. Long-term leverage (see Table 7 in the appendix) fully mediates the direct effect of INSTO and FRNO on EMZSCORE. The direct impact of these two ownership elements on financial distress is positive but not statistically significant. Long-term leverage does not mediate the effects of OWNC, INSDO, and GOVO on EMZSCORE. However, the direct effect of long-term leverage on financial distress remains consistently positive. For short-term leverage (see Table 8 in the appendix), the influence of INSDO, FRNO, and GOVO is fully mediated by short-term leverage. Among these, INSDO's effect on short-term leverage is positive, suggesting that insider managers with ownership stakes prefer short-term leverage (Himmelberg, et al., 1999; Jensen, et al., 1992). The direct effects of all five ownership components on EMZSCORE are insignificant in this context.

The results for control variables are consistent across all scenarios. Liquidity, measured by the current ratio, is a significant and positive predictor of EMZSCORE, indicating a lower likelihood of financial distress, which confirms that firms with higher liquidity are generally in safer positions (Chow & Fung, 2000; Owolabi & Obida, 2012). Conversely, the findings show that firms with more liquidity tend to avoid borrowing. Return on assets is a significant positive predictor of EMZSCORE and has a negative influence on total leverage. Asset tangibility seems to be an insignificant predictor of financial distress (Isayas, 2021) but a significant and positive predictor of leverage (Olakunle & Oni, 2014). This supports the collateral hypothesis, which highlights the role of tangible assets as solid collateral for securing favorable loan terms. Firm size significantly reduces financial distress, as evidenced by its positive and significant impact on EMZSCORE, supporting the idea of "too big to fail' (Strahan, 2013). However, its negative effect on total leverage aligns with the life cycle theory, suggesting that mature firms do not need to expand and rely less on external borrowing (Mueller, 1972). Firm growth exhibits a positive but statistically insignificant impact on both financial distress and total leverage. The COVID dummy variable indicates that the pandemic also influences enterprise failure, negatively affecting financial distress; however, during the pandemic, there was increased reliance on leverage.

5.3 Robustness Checks with Alternative Regressions

This study uses alternative regression models to check the robustness of our baseline models. The findings were not affected by different methodological choices. We also applied the panel-corrected standard error (PCSE) regression to our current data to further explore the mediating effects of leverage structure. PCSE is appropriate when data are subject to heteroskedasticity and can handle serial correlation (Chen, et al., 2008). In our case, the number of cross sections (N) exceeds the number of periods (T), which also supports the use of PCSE. Tables 9, 10, and 11 are designed to illustrate the mediating role of total, long-term, and short-term leverage, respectively.

Table 9 in the appendix presents the mediating role of total leverage in the relationship between corporate ownership structure and financial distress, as measured by PCSE. The results for OWNC remain consistent with our previous analysis. The direct effect of OWNC on financial distress and total leverage is insignificant, confirming our findings. Like earlier results, an increase in total leverage significantly raises the likelihood of default (Su, et al., 2025). PCSE shows that INSTO has a significant and positive effect on total leverage, while total leverage is a significant negative predictor of EMZSCORE (indicating a higher probability of financial distress). Additionally, FRNO and GOVO significantly and negatively influence total leverage, which in turn is a significant negative predictor of EMZSCORE (Udin, et al., 2017). Therefore, total leverage fully mediates these relationships. However, no mediation effect of total leverage is observed between OWNC and financial distress. Table 10 in the appendix explores the mediating role of long-term leverage on the association between ownership structure and financial distress using PCSE. In this case, long-term leverage fully mediates the effects of INSTO and INSDO on EMZSCORE, but no mediation is found for OWNC, FRNO, or GOVO. Table 11 in the appendix examines the influence of short-term leverage as a mediator via PCSE. A strong preference for short-term debt is evident for OWNC and INSDO, while FRNO and GOVO show a significant negative impact on short-term debt. The effect of short-term debt on EMZSCORE (the probability of financial distress) is consistently negative (or positive). Thus, it can be concluded that short-term leverage fully mediates these four relationships. However, no mediation is observed for INSTO.

5.4 Discussion

Regarding the first hypothesis, OWNC has a negative direct impact on financial distress but a positive impact on total leverage, long-term leverage, and short-term leverage. The leverage variables, whether total, long-term, or short-term, have a significant, negative impact on financial distress. This rejects the first proposition that leverage structure significantly mediates the relationship between OWNC and financial distress. Previous researchers also support the notion that OWNC causes high financial distress (Kanoujiya, et al., 2023; Udin, et al., 2017), but unlike our study, they advocate underutilization of leverage as managerial decision powers are also concentrated in the hands of a few individuals (Bui, 2022). The second hypothesis proposes that the leverage structure mediates the impact of INSTO on financial distress. The results reveal that total leverage and long-term leverage fully mediate this relationship, as no significant direct impact of INSTO on financial distress was found. There is recent evidence on the

mediating role of financial leverage (Hussain, et al., 2022; Xuezhou, Hussain, Salameh, et al., 2022). However, short-term leverage does not mediate this relationship, as found by studies that reject the use of extensive short-term debt due to rollover risk (Zhou, et al., 2024).

The result of the third hypothesis shows that total leverage and short-term leverage fully mediate the relationship between INSDO and financial distress. However, no such evidence emerged in the case of long-term leverage. Insiders are the managers in an enterprise who have a considerable stake in the ownership of the firm. Literature suggests that managers' stake in the organization should be enhanced as their pursuit of personal wealth maximization benefits other stakeholders as well (Alam, et al., 2024). However, they may prioritize their gains instead of protecting the enterprise as a whole (Yousaf, et al., 2024). Such situations may also lead to a substantial increase in leverage and financial distress. For FRNO, there is evidence of a preference for long-term leverage. FRNO has a significant effect on long-term leverage, but it is negative for total leverage and short-term leverage. This evidence supports the fourth hypothesis, which posits that the leverage structure mediates the relationship between FRNO and financial distress. Literature also supports that higher foreign stake reduces reliance on leverage and thus reduces the probability of financial distress (Ali, et al., 2022). Moreover, a preference towards long-term leverage also defers current payment obligations, which at least postpones the default probability (Zhu, et al., 2021). Managers can buy time to rectify situations and make them favorable (Barry, et al., 2022). The final hypothesis of the study is rejected as total leverage and long-term leverage do not mediate the relationship between GOVO and financial distress. However, short-term leverage negatively and significantly mediates the relationship between GOVO and financial distress. The direct impact of increased government stake in corporate ownership causes an increase in the chances of default, but this was found to be statistically insignificant (Shahab, et al., 2019).

6. Conclusion and Policy Implications

6.1 Conclusion

This study demonstrates that the path from corporate ownership to financial distress is not direct but is significantly channeled through the firm's leverage structure. By dissecting leverage into its capital and debt maturity components, we provide granular evidence on how different owner types—institutional, insider, foreign, and state—employ distinct financing strategies that ultimately shape corporate vulnerability. This study provides a nuanced understanding of the precursors to corporate financial distress by investigating the intricate interplay between ownership structure and leverage decisions in an emerging market. By doing so, we deliver on the key contributions outlined in our introduction. First, we have moved beyond a simple direct-effects model by empirically demonstrating that leverage structure serves as a critical mediating channel through which ownership composition influences firm risk. Second, our analysis innovates by decomposing leverage into both capital structure (total leverage) and debt maturity (short-term and long-term leverage), revealing that different ownership types utilize these financial tools in distinct ways. Third, by focusing on non-financial firms in the unique institutional context of Pakistan—an environment characterized by evolving governance codes and financial constraints—our findings offer

fresh evidence that enriches the corporate finance literature. Ultimately, our research clarifies the precise mechanisms through which ownership decisions translate into financial vulnerability, highlighting that the path to financial distress is not monolithic but is shaped by strategic financing choices. This study highlights that enterprises can use leverage structures as a tool to manage financial distress, which could threaten the firm's sustainability and the going-concern assumption if mismanaged. Therefore, firms facing high financial distress should pursue less risky external financing options. Firms in financial trouble are at risk of bankruptcy if not properly managed. This research fills a gap in the literature by emphasizing the importance of strategic decision-making, linking governance structures to their outcomes. Past studies have not fully explored the decision mechanisms that lead to desired or undesired results. The limited literature on the importance of financial decision-making in connecting governance variables to performance is noted (Naseem, et al., 2021). Additionally, only a few studies have provided recommendations for integrating financial decisions into governance-performance or governance-risk relationships (Hussain, et al., 2022; Kassim, et al., 2013; Zingales, 2000). Our study analyzes the monitoring role of owners and investigates how ownership structure influences financial distress. The mediating role of leverage structure is assessed using proxies for total leverage, long-term leverage, and short-term leverage. Total leverage is considered a proxy for capital structure, while long-term and short-term leverage reflect measures of debt maturity structure in listed Pakistani non-financial firms. Pooled OLS and PCSE regression models are employed for panel data econometric analysis.

The findings of this study demonstrate that the direct impact of all five ownership structures on financial distress is insignificant. This supports the conclusions of Hussain, et al. (2022), who suggest that specific decisions influence the likelihood of financial distress, while governance variables have little effect. Additionally, INSTO and INSDO are found to have a significant positive effect on total leverage. However, it is significant and negative for FRNO. In the case of long-term debt, the overall impact of all ownership variables is positive, but it is only significant for INSTO and FRNO. Furthermore, FRNO and GOVO have a significant negative effect on short-term debt, whereas INSDO shows a significant positive effect on short-term debt. Moreover, both capital structure and debt maturity have a significantly negative impact on the Z-score of an emerging market, indicating an increase in the number of companies experiencing financial distress. These findings suggest that total leverage mediates the relationship between INSTO, INSDO, and FRNO, and has a negative impact on financial distress. Similarly, long-term debt also mediates the relationship between INSTO and FRNO, as well as financial distress, negatively. Finally, short-term debt significantly and negatively mediates the impact of INSDO, FRNO, and GOVO on financial distress.

6.2 Policy Implications and Suggestions

This study has multiple implications for managers and policymakers at the organizational and regulatory levels. Based on this research, certain strategic changes can be considered during policymaking to help firms avoid financial vulnerability. The first implication involves improving the corporate governance codes of non-financial firms, which are a vital part of the governance framework. Implementing updated governance codes is essential for developing nations to address the unethical conduct of corporate leaders.

Strengthening investor protection regulations can enhance investor confidence in the financial system, thereby helping to prevent agency conflicts and fostering a healthy investment culture in both equity and debt markets. Governments should create policies that make external financing more affordable by lowering benchmark interest rates on loans for commercial purposes. Long-term financing, being less risky, can support industrial growth, ultimately boosting the country's economic development. Pakistan's large, undocumented economy makes it difficult to track business and financial transactions, which hampers effective monitoring of loan performance and fund utilization by firms. The key research implications include: (a) reducing reliance on debt, whether total, long-term, or short-term, since high debt increases the risk of bankruptcy due to financial distress; (b) ensuring borrowings are on reasonable terms so managers can use funds for organizational growth rather than merely managing financial distress; and (c) encouraging corporate managers to use funds efficiently, whether owned or borrowed, to improve organizational performance and ultimately increase shareholder satisfaction through the reduction of financial distress.

This study, like any other, has several limitations that can be addressed in future research. We recommend incorporating additional governance variables into a similar framework and exploring alternative proxies for measuring financial distress. This study is limited to the non-financial sector; however, there is a need to expand its scope to include the financial sector as well. Moreover, it could be interesting to focus on Shariah-compliant enterprises that are not reliant on interest-based financial products. Additionally, adopting a multi-country perspective could enhance the authenticity and generalizability of such research in the future. A firm's leverage decisions are not limited to the debt-equity mix or debt maturity; they also involve an important decision regarding the cost of debt and equity. This crucial factor has been overlooked in this study and warrants attention in future research. Furthermore, insolvency risk is the primary focus here; however, other risks, such as idiosyncratic risk, share price risk, liquidity risk, and investment risk, should also be explored within this framework. This research is broad in its theoretical relevance and is not restricted to the theories discussed here. Future research may develop alternative theoretical explanations, particularly within the context of delegation theory and stewardship theory.

Our study connects to the field of decision sciences (Chang, et al., 2018; Hasan-Zadeh, 2019). The empirical findings help corporate managers understand how leverage structures influence the relationship between ownership structure and financial distress, which is valuable for making informed financing decisions to maximize company value.

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Appendix

Table 1. Summary of empirical evidence in the Pakistani context

No	Year	Author(s)	Empirical Evidence
1	2022	Altaf, et al. (2022)	This study analyzed the impact of corporate governance and operational risk identification on operational risk management in commercial banks in Pakistan.
2	2020	Hussain, Wen, et al. (2020)	They examined whether financing decisions taken to pursue growth can be used as a tool to control corporate insolvency risk.
3	2020	Xuezhou, et al. (2020)	The study focused on the leverage structure of agriculture-linked firms and its impact on financial distress. The study proved a positive moderation of asset tangibility.
4	2021	Hussain, et al. (2021)	This research focused on the mediated moderation role of debt maturity and fixed collateral in defining the association between board vigilance and insolvency risk.
5	2022	Xuezhou, Hussain, Hussain, et al. (2022)	The study analyzed the mediated effects of leverage structure and asset tangibility on the relationship between board vigilance and financial distress.
6	2022	Xuezhou, Hussain, Salameh, et al (2022)	This study focused on internal and external growth and their impact on insolvency risk through the mediation of leverage structure and the positive interaction of potential fixed collaterals.
7	2022	Hussain, Wen, et al. (2022)	This study compared financial leverage and debt maturity and found mediation of debt maturity on the association between board structure and bankruptcy risk.
8	2022	Huynh, et al. (2022)	They detected a partial intervening role of financial leverage on the relationship between board size and independence on performance, but a full mediation was detected for audit committee size and female members.
9	2022	Kijkasiwat, et al. (2022)	This study established the mediating role of leverage for both developed and emerging economies. However, extensive use of leverage causes performance failures.
10	2020	Tahir, et al. (2020)	They detected the mediating impact of financial leverage on the attributes of the corporate board and payout policy, except for the board size.
11	2025	Hussain, et al. (2025)	This monograph extensively discusses the role of corporate governance and CSR in mitigating financial distress and corporate risks.

Table 2. Sample selection

Economic Groups	Total	Selected	Not Selected
1) Textiles	119	70 (58.82%)	49 (41.17%)
2) Sugar	27	19 (70.37%)	8 (29.62%)
3) Food	20	10 (50%)	10 (50%)
4) Chemicals, chemical products, and Pharmaceuticals	44	28 (63.63%)	16 (36.36%)
5) Manufacturing	40	23 (57.5%)	17 (42.5%)
6) Mineral products	09	8 (88.8%)	1 (11.11%)
7) Cement	17	11 (64.70%)	6 (35.29%)
8) Motor vehicles, trailers, and auto parts	21	13 (61.90%)	8 (38.09%)
9) Fuel and energy	21	16 (76.19%)	5 (23.80%)
10) Information, communication, and transport services	16	11 (68.75%)	5 (31.25%)
11) Coke and refined petroleum products	11	6 (54.54%)	5 (45.45%)
12) Paper, paperboard, and products	09	4 (44.44%)	5 (55.55%)
13) Electrical machinery and apparatus	06	5 (83.33%)	1 (16.66%)
14) Other service activities	09	7 (77.77%)	2 (22.22%)
Total	369	231 (62.60%)	138 (37.39%)

Table 3. Variable description

Variable	Notation	Measurement	Expected impact	Actual impact
Financial distress	EMZSCORE	EMZSCORE = 6.56X1 + 3.26 X2 + 6.72 X3 + 1.05 X4 + 3.25	-	-
Institutional ownership	INSTO	Percentage of shares held by other institutions in an enterprise	Positive	Negative
Ownership concentration	OWNC	Percentage of shares held by the five largest shareholders	Negative	Negative
Insider ownership	INSDO	Percentage of the number of shares owned by enterprise managers	Positive	Positive
Foreign ownership	FRNO	Percentage of the number of shares owned by foreign investors	Positive	Negative
Government ownership	GOVO	Percentage of government ownership in an enterprise	Negative	Negative
Total leverage	TDTA	A ratio of total debt to total assets	Negative	Negative
Long-term leverage	LTDTA	The ratio of long-term debt to total assets	Positive	Negative
Short-term leverage	STDTA	A ratio of short-term debt to total assets	Negative	Negative
Liquidity	CR	Current assets divided by current liabilities	Positive	Positive
Profitability	ROA	Net earnings divided by total assets	Positive	Positive
Asset tangibility	AT	Fixed assets as a percentage of total assets	Positive	Negative
Firm size	SIZE	Natural log of total assets	Positive	Positive
Asset growth	AG	Rate of growth in assets	Positive	Positive
Covid	COVID	Binary variable with “1” as the COVID period and “0” otherwise	Negative	Negative

Table 4. Initial diagnostics

Variable	N	X	Σ	FD	INSTO	OWNC	INSDO	FRNO	GOVO	TDTA	CR	ROA	AT	SIZE	AG	COVID	VIF
FD	1155	6.159	15.003	1													
INSTO	1155	0.091	0.116	-0.037	1												1.13
OWNC	1155	0.641	0.196	-0.015	-0.117*	1											1.06
INSDO	1155	0.268	0.293	-0.036	-0.259*	0.038	1										1.21
FRNO	1155	0.051	0.158	-0.006	-0.036	0.121*	-0.168*	1									1.07
GOVO	1155	0024	0.126	-0.003	0.045	0.135*	-0.161*	-0.041	1								1.16
TDTA	1155	0.261	0.237	-0.29*	0.057	0.026	0.140*	-0.088*	-0.034	1							1.11
CR	1155	2.431	13.333	0.914*	-0.046	-0.019	-0.031	-0.016	-0.004	-0.116*	1						1.08
ROA	1155	3.798	14.628	0.128*	0.027	0.024	0.003	0.055	-0.035	-0.224*	0.003	1					1.14
AT	1155	0.782	0.935	-0.12*	-0.047	-0.007	0.110*	-0.057*	-0.006	0.100*	-0.06*	-0.12*	1				1.22
SIZE	1155	15.742	1.896	-0.09*	0.181*	0.045	-0.257*	0.086*	0.288*	-0.055	-0.18*	0.13*	-0.35*	1			1.45
AG	1155	0.099	0.190	-0.013	0.004	-0.003	-0.002	0.027	-0.005	-0.035	-0.08*	0.25*	-0.24*	0.21*	1		1.16
COVID	1155	–	–	-0.021	-0.014	-0.004	-0.007	-0.021	0.007	0.001	-0.020	0.013	-0.005	0.057	-0.09*	1	1.02

Variable Definitions: FD (Financial Distress): Measured by the emerging market Z-score (EMZSCORE), where a lower value indicates a higher probability of distress. INSTO: Institutional Ownership (%). OWNC: Ownership Concentration (%, top 5 shareholders). INSDO: Insider Ownership (%). FRNO: Foreign Ownership (%). GOVO: Government Ownership (%). TDTA: Total Leverage (Total Debt / Total Assets). CR: Current Ratio (Current Assets / Current Liabilities). ROA: Return on Assets (%). AT: Asset Tangibility (Fixed Assets / Total Assets). SIZE: Firm Size (Natural log of total assets). AG: Asset Growth (%). COVID: A dummy variable, 1 for the years 2020-2021, and 0 otherwise.

Note: This table presents descriptive statistics, a pairwise correlation matrix, and Variance Inflation Factors (VIF) for all variables used in the analysis. The sample consists of 231 non-financial firms listed on the Pakistan Stock Exchange from 2017 to 2021, resulting in 1,155 firm-year observations. The correlation coefficients are Pearson's coefficients. * denotes statistical significance of the correlation at the 1% level. VIF values below 10 suggest that multicollinearity is not a significant concern.

Table 5. Panel unit root test

Augmented Dickey-Fuller test								
Variable	**No trend**				**Trend**			
	Inverse χ^2	**Inverse Normal**	**logit**	**Modified inverse χ^2**	**Inverse χ^2**	**Inverse Normal**	**logit**	**Modified inverse χ^2**
FD	1279.374 (0.000)	-5.592 (0.000)	-13.080 (0.000)	26.889 (0.000)	2216.765 (0.000)	-10.108 (0.000)	-28.195 (0.000)	57.727 (0.000)
INSTO	1624.860 (0.000)	-6.426 (0.000)	-20.768 (0.000)	38.255 (0.000)	2318.825 (0.000)	-10.834 (0.000)	-33.514 (0.000)	61.085 (0.000)
OWNC	1618.547 (0.000)	-6.127 (0.000)	-20.803 (0.000)	38.047 (0.000)	2448.067 (0.000)	-12.331 (0.000)	-37.835 (0.000)	65.336 (0.000)
INSDO	1643.257 (0.000)	-1.373 (0.008)	-17.310 (0.000)	38.860 (0.000)	1777.812 (0.000)	-1.785 (0.037)	-18.799 (0.000)	43.287 (0.000)
FRNO	1260.522 (0.000)	-7.771 (0.000)	-22.085 (0.000)	26.269 (0.000)	1781.502 (0.000)	-12.677 (0.000)	-34.361 (0.000)	43.408 (0.000)
GOVO	3024.930 (0.000)	-1.648 (0.009)	-1.626 (0.009)	14.203 (0.000)	6587.67 (0.000)	-2.309 (0.009)	-1.469 (0.009)	13.031 (0.000)
TDTA	1207.720 (0.000)	-5.542 (0.000)	-13.810 (0.000)	24.532 (0.000)	1974.150 (0.000)	-8.703 (0.000)	-25.598 (0.000)	49.746 (0.000)
LTDTA	1315.496 (0.000)	-6.794 (0.000)	-17.185 (0.000)	28.078 (0.000)	1978.521 (0.000)	-9.850 (0.000)	-29.215 (0.000)	49.889 (0.000)
STDTA	1122.227 (0.000)	-5.167 (0.000)	-13.356 (0.000)	21.719 (0.000)	1884.599 (0.000)	-6.094 (0.000)	-23.731 (0.000)	46.800 (0.0000
CR	1934.161 (0.000)	-9.881 (0.000)	-25.387 (0.0000	48.430 (0.000)	2560.558 (0.000)	-12.883 (0.000)	-35.786 (0.000)	69.037 (0.000)
ROA	1515.117 (0.000)	-10.370 (0.000)	-19.911 (0.000)	34.645 (0.000)	1805.361 (0.000)	-7.239 (0.000)	-21.309 (0.000)	44.193 (0.000)
AT	1507.658 (0.000)	-8.181 (0.000)	-18.451 (0.000)	34.399 (0.000)	2678.854 (0.000)	-12.594 (0.000)	-37.288 (0.000)	72.929 (0.000)
SIZE	1586.734 (0.000)	-4.448 (0.000)	-16.043 (0.000)	37.001 (0.000)	2117.454 (0.000)	-7.977 (0.000)	-25.863 (0.000)	54.460 (0.000)
AG	1563.288 (0.000)	-13.856 (0.000)	-22.520 (0.000)	36.229 (0.000)	2053.816 (0.000)	-9.533 (0.000)	-26.385 (0.000)	52.366 (0.000)

Phillips-Perron test								
Variable	**No trend**				**Trend**			
	Inverse χ^2	**Inverse Normal**	**logit**	**Modified inverse χ^2**	**Inverse χ^2**	**Inverse Normal**	**logit**	**Modified inverse χ^2**
FD	1279.374 (0.000)	-5.592 (0.000)	-13.080 (0.000)	26.889 (0.000)	2216.765 (0.000)	-10.108 (0.000)	-28.195 (0.000)	57.727 (0.000)
INSTO	1624.860 (0.000)	-6.426 (0.000)	-20.768 (0.000)	38.255 (0.000)	2318.825 (0.000)	-10.834 (0.000)	-33.514 (0.000)	61.085 (0.000)
OWNC	1618.547 (0.000)	-6.127 (0.000)	-20.803 (0.000)	38.047 (0.000)	2448.067 (0.000)	-12.331 (0.000)	-37.835 (0.000)	65.336 (0.000)
INSDO	1787.432 (0.000)	-2.488 (0.006)	-19.971 (0.000)	43.603 (0.000)	1921.986 (0.000)	-2.952 (0.001)	-21.577 (0.000)	48.030 (0.000)
FRNO	1260.522 (0.000)	-7.771 (0.000)	-22.085 (0.000)	26.269 (0.000)	1781.502 (0.000)	-12.677 (0.000)	-34.361 (0.000)	43.408 (0.000)
GOVO	3024.93 (0.000)	-1.648 (0.006)	-1.626 (0.007)	14.203 (0.000)	6587.67 (0.000)	-2.309 (0.009)	-1.469 (0.009)	13.031 (0.000)
TDTA	1207.720 (0.000)	-5.542 (0.000)	-13.810 (0.000)	24.532 (0.000)	1974.150 (0.000)	-8.703 (0.000)	-25.598 (0.000)	49.746 (0.000)
LTDTA	1315.496 (0.000)	-6.794 (0.000)	-17.185 (0.000)	28.078 (0.000)	1978.521 (0.000)	-9.850 (0.000)	-29.215 (0.000)	49.889 (0.000)
STDTA	1122.227 (0.000)	-5.167 (0.000)	-13.356 (0.000)	21.719 (0.000)	1884.599 (0.000)	-6.094 (0.000)	-23.731 (0.000)	46.800 (0.0000
CR	1934.161 (0.000)	-9.881 (0.000)	-25.387 (0.0000	48.430 (0.000)	2560.558 (0.000)	-12.883 (0.000)	-35.786 (0.000)	69.037 (0.000)
ROA	1515.117 (0.000)	-10.370 (0.000)	-19.911 (0.000)	34.645 (0.000)	1805.361 (0.000)	-7.239 (0.000)	-21.309 (0.000)	44.193 (0.000)
AT	1507.658 (0.000)	-8.181 (0.000)	-18.451 (0.000)	34.399 (0.000)	2678.854 (0.000)	-12.594 (0.000)	-37.288 (0.000)	72.929 (0.000)
SIZE	1586.734 (0.000)	-4.448 (0.000)	-16.043 (0.000)	37.001 (0.000)	2117.454 (0.000)	-7.977 (0.000)	-25.863 (0.000)	54.460 (0.000)
AG	1563.288 (0.000)	-13.806 (0.000)	-22.520 (0.000)	36.229 (0.000)	2053.816 (0.000)	-9.533 (0.000)	-26.385 (0.000)	52.366 (0.000)

Note: FD stands for financial distress and is measured by EMZSCORE. The formulae of the combination unit root tests are shown in Choi (2001). The figures in the brackets are p-values of the combination unit root test statistics.

Table 6. Mediation analysis- Ownership structure, total leverage, and financial distress (Pooled OLS)

Model	**INSTO, total leverage, and financial distress**			**OWNC, total leverage, and financial distress**			**INSDO, total leverage, and financial distress**			**FRNO, total leverage, and financial distress**			**GOVO, total leverage, and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)
Cons	-1.340 (0.57)	0.337* (0.00)	2.037 (0.34)	-1.154 (0.62)	0.303* (0.00)	1.881 (0.37)	-1.602 (0.56)	0.224* (0.00)	0.693 (0.65)	-1.274 (0.59)	0.321* (0.00)	1.960 (0.36)	-1.537 (0.55)	0.301* (0.00)	1.479 (0.52)
INSTO	-0.915 (0.57)	0.141** (0.03)	0.495 (0.71)												
OWNC				-0.190 (0.74)	0.038 (0.26)	0.191 (0.73)									
INSDO							0.360 (0.60)	0.107* (0.00)	1.455* (000)						
FRNO										-0.336 (0.58)	-0.109* (0.01)	-1.442** (0.03)			
GOVO													-0.784 (0.65)	-0.069 (0.32)	-1.476 (0.33)
TDTA			-10.001* (0.00)			-9.989* (0.00)			-10.221* (0.00)			-10.05* (0.00)			-10.011* (0.00)
CR	1.035* (0.00)	-0.002** (0.00)	1.015* (0.00)	1.035* (0.00)	-0.002* (0.00)	1.015* (0.00)	1.036* (0.00)	-0001* (0.00)	1.017* (0.00)	1.035* (0.00)	-0.002* (0.00)	1.015* (0.00)	1.03* (0.00)	-0.002* (0.00)	1.016* (0.00)
ROA	0.115* (0.00)	-0.003* (0.00)	0.079* (0.00)	0.115* (0.00)	-0.003* (0.00)	0.079* (0.00)	0.114* (0.00)	-0.003* (0.00)	0.077* (0.00)	0.115* (0.00)	-0.003* (0.00)	0.079* (0.00)	0.114* (0.00)	-0.003* (0.07)	0.078* (0.00)
AT	-0.537 (0.14)	0.016** (0.04)	-0.377 (0.10)	-0.538 (0.14)	0.016** (0.04)	-0.311 (0.10)	-0.541 (0.14)	0.015** (0.05)	-0.384* (0.09)	-0.540 (0.14)	0.015** (0.04)	-0.383* (0.09)	-0.528 (0.15)	0.017 (0.35)	-0.355 (0.12)

SIZE	0.0137** (0.03)	-0.005 (0.15)	0.259* (0.06)	0.307** (0.04)	-0.004 (0.28)	0.264** (0.05)	0.321** (0.05)	0.001 (0.89)	0.327** (0.03)	0.308** (0.04)	-0.003 (0.38)	0.247** (0.04)	0.324** (0.04)	-0.002 (0.68)	0.300** (0.04)
AG	1.393 (0.23)	0.043 (0.24)	1.831** (0.04)	1.413 (0.22)	0.040 (0.28)	1.822** (0.04)	1.390 (0.23)	0.032 (0.39)	1.717** (0.05)	1.414 (0.23)	0.039 (0.30)	1.809** (0.05)	1.398 (0.23)	0.038 (0.44)	1.783** (0.05)
COVID	-0.135 (0.70)	0.004 (0.73)	-0.089 (0.78)	-0.130 (0.71)	0.003 (0.78)	-0.092 (0.07)	-0.131 (0.71)	0.002 (0.83)	-0.101 (0.75)	-0.132 (0.71)	0.002 (0.84)	-0.105 (0.74)	-0.132 (0.71)	0.003 (0.81)	-0.098 (0.76)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.85	0.07	0.88	0.85	0.07	0.88	0.85	0.09	0.88	0.85	0.08	0.88	0.86	0.07	0.88
F-stat	113.62* (0.00)	13.18* (0.00)	101.67* (0.00)	114.54* (0.00)	12.49* (0.00)	100.52* (0.00)	113.11* (0.00)	15.44* (0.00)	100.06* (0.00)	113.99* (0.00)	13.32* (0.00)	99.21* (0.00)	113.28* (0.00)	2.74* (0.00)	99.58* (0.00)
Cook Weisberg	3252.09* (0.00)	0.40 (0.52)	5026.42* (0.00)	3250.83* (0.00)	0.27 (0.60)	5022.69* (0.00)	3231.59* (0.00)	0.59 (0.44)	4990.86* (0.00)	3249.84* (0.00)	0.00 (0.94)	5050.19* (0.00)	3236.31* (0.00)	3.62** (0.05)	5005.40* (0.00)

Variable Definitions: Dependent Variable (FD): Financial Distress, measured by EMZSCORE (a lower value implies a higher probability of distress). Mediating Variable (TDTA): Total Leverage (Total Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table reports the results of the mediation analysis using Pooled OLS with robust standard errors to correct for heteroscedasticity. The analysis follows the three-step Preacher and Hayes (2004) approach to test the mediating effect of Total Leverage (TDTA) on the relationship between ownership structures and Financial Distress (FD). Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. All models include year, firm, and industry fixed effects, though coefficients are not reported for brevity. The Cook-Weisberg test for heteroscedasticity confirmed its presence, justifying the use of robust standard errors.

Table 7. Mediation analysis- Ownership structure, Long-term leverage, and financial distress (Pooled OLS)

Model	**INSTO, long-term leverage, and financial distress**			**OWNC, long-term leverage, and long-term financial distress**			**INSDO, long-term leverage, and financial distress**			**FRNO, long-term leverage, and financial distress**			**GOVO, long-term leverage, and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)
Cons	-1.342 (0.57)	-0.109** (0.04)	-2.075 (0.39)	-1.154 (0.62)	-0.121* (0.002)	-1.971 (0.411)	-1.602 (0.56)	-0.131* (0.00)	-2.495 (0.37)	-1.274 (0.59)	-0.518* (0.00)	-1.260 (0.60)	-1.537 (0.55)	-0.102** (0.05)	-2.230 (0.39)
INSTO	-0.915 (0.57)	0.096* (0.09)	-0.268 (0.86)												
OWNC				-0.190 (0.74)	0.006 (0.73)	-0.145 (0.80)									
INSDO							0.360 (0.60)	0.015 (0.26)	0.463 (0.501)						
FRNO										-0.336 (0.58)	0.229* (0.00)	-0.342 (0.592)			
GOVO													-0.784 (0.654)	0.041 (0.47)	-0.506 (0.75)
LTDTA			-6.725* (0.001)			-6.743* (0.002)			-6.778* (0.00)			-0.028** (0.03)			-6.727* (0.00)
CR	1.035* (0.00)	-0.0001 (0.24)	1.034* (0.00)	1.035* (0.00)	-0.000 (0.52)	1.034* (0.00)	1.036* (0.00)	-0.000 (0.582)	1.035* (0.00)	1.035* (0.00)	0.000** (0.03)	1.035* (0.00)	1.036* (0.00)	-0.002 (0.18)	1.034* (0.00)
ROA	0.115* (0.00)	-0.002** (0.03)	0.101* (0.00)	0.115* (0.00)	-0.002* (0.00)	0.101* (0.00)	0.114* (0.00)	-0.002* (0.00)	0.100* (0.00)	0.115* (0.00)	-0.001 (0.55)	0.115* (0.00)	0.114* (0.00)	-0.002** (0.03)	0.101* (0.00)
AT	-0.5379 (0.14)	0.0119** (0.04)	-0.4573 (0.18)	-0.5387 (0.14)	0.0120* (0.00)	-0.4572 (0.18)	-0.5418 (0.14)	0.0119 (0.00)	-0.4608 (0.17)	-0.5406 (0.14)	0.0226** (0.04)	-0.5413 (0.14)	-0.5280 (0.155)	0.0115** (0.05)	-0.4506 (0.18)
SIZE	0.317** (0.03)	0.011* (0.003)	0.392* (0.01)	0.307** (0.04)	0.123* (0.00)	0.390* (0.01)	0.321** (0.05)	0.012* (0.00)	0.409* (0.01)	0.308** (0.04)	0.050* (0.00)	0.307** (0.04)	0.324** (0.04)	0.011* (0.00)	0.401* (0.01)
AG	1.393 (0.23)	0.061* (0.006)	1.809 (0.12)	1.413 (0.22)	0.059* (0.006)	1.814 (0.12)	1.390 (0.235)	0.058 (0.00)	1.784 (0.12)	1.414 (0.23)	0.142* (0.00)	1.410 (0.23)	1.398 (0.23)	0.060* (0.00)	1.803 (0.12)

Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COVID	-0.135 (0.70)	0.006 (0.41)	-0.093 (0.79)	-0.130 (0.71)	0.005 (0.48)	-0.092 (0.79)	-0.131 (0.712)	0.005 (0.49)	-0.947 (0.37)	-0.132 (0.71)	0.042** (0.03)	-0.133 (0.71)	-0.132 (0.71)	0.005 (0.45)	-0.093 (0.79)
R-square	0.85	0.08	0.86	0.85	0.07	0.86	0.85	0.07	0.86	0.85	0.09	0.85	0.85	0.07	0.86
F-stat	113.62* (0.00)	11.96* (0.00)	98.31* (0.00)	114.54* (0.00)	13.10* (0.00)	100.15* (0.00)	113.11* (0.00)	13.28* (0.00)	98.10 (0.00)	113.99* (0.00)	18.00* (0.00)	104.77* (0.00)	113.28* (0.00)	8.08* (0.00)	97.99* (0.00)
Cook Weisberg	3252.09* (0.00)	37.68* (0.00)	3369.87* (0.00)	3250.83* (0.00)	2.39 (0.12)	3371.10* (0.00)	3231.59* (0.00)	1.87 (0.17)	3349.31 (0.00)	3249.84* (0.00)	1.56 (0.21)	3249.28* (0.00)	3236.31 (0.00)	6.73* (0.00)	3361.64* (0.00)

Dependent Variable (FD): Financial Distress (EMZSCORE). Mediating Variable (LTDTA): Long-Term Leverage (Long-Term Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table reports the results of the mediation analysis using Pooled OLS with robust standard errors. It tests the mediating effect of Long-Term Leverage (LTDTA) on the relationship between ownership structures and Financial Distress (FD). Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. All models include year, firm, and industry fixed effects.

Table 8. Mediation analysis- Ownership structure, Short-term leverage, and financial distress (Pooled OLS)

Model	**INSTO, Short-term leverage and financial distress**			**OWNC, Short-term leverage and financial distress**			**INSDO, Short-term leverage and financial distress**			**FRNO, Short-term leverage and financial distress**			**GOVO, Short-term leverage and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)
Cons	-1.3428 (0.57)	0.4469* (0.00)	3.6942* (0.10)	-1.1548 (0.62)	0.4251* (0.00)	3.6412* (0.10)	-1.6024 (0.56)	0.3564* (0.00)	2.5188 (0.33)	-1.2748 (0.59)	0.4397* (0.00)	3.7213* (0.09)	-1.5378 (0.55)	0.4043* (0.00)	3.0573 (0.20)
INSTO	-0.9155 (0.57)	0.0449 (0.279)	-0.4095 (0.78)												
OWNC				-0.1902 (0.74)	0.0315 (0.17)	0.1659 (0.76)									
INSDO							0.3602 (0.60)	0.0918* (0.00)	1.4223** (0.02)						
FRNO										-0.3363 (0.58)	-0.9100* (0.00)	-1.370** (0.03)			
GOVO													-0.7845 (0.654)	-0.1104* (0.00)	-2.0393 (0.22)
STDTA			-11.269* (0.00)			-11.281* (0.00)			-11.563* (0.00)			-11.361* (0.00)			-11.365* (0.00)
CR	1.0357* (0.00)	-0.0018* (0.00)	1.0149* (0.00)	1.0358* (0.00)	-0.0018* (0.00)	1.0149* (0.00)	1.036* (0.00)	-0.0017* (0.00)	1.0167* (0.00)	1.0358* (0.00)	-0.0018* (0.00)	1.0146* (0.00)	1.0363* (0.00)	-0.0017* (0.00)	1.0159* (0.00)
ROA	0.1152* (0.00)	-0.0015 (0.22)	0.0982* (0.00)	0.1152* (0.00)	-0.0015 (0.22)	0.0980* (0.00)	0.1149* (0.00)	-0.0015 (0.20)	0.0968* (0.00)	0.1153* (0.00)	-0.0014 (0.23)	0.09868* (0.00)	0.1147* (0.00)	-0.0015 (0.22)	0.0969* (0.00)
AT	-0.5379 (0.14)	0.0040 (0.76)	-0.492** (0.05)	-0.5387 (0.14)	0.0040 (0.76)	-0.492** (0.05)	-0.5418 (0.14)	0.0033 (0.80)	-0.5026* (0.05)	-0.5406 (0.14)	0.0036 (0.78)	-0.499** (0.05)	-0.5280 (0.155)	0.0056 (0.67)	-0.4635* (0.07)
SIZE	0.3172** (0.03)	-0.0169* (0.00)	0.1263 (0.37)	0.3073** (0.04)	-0.0165* (0.00)	0.1205 (0.38)	0.3218** (0.05)	-0.0124* (0.00)	0.1775 (0.25)	0.3084** (0.04)	-0.0158* (0.00)	0.1283 (0.35)	0.3248** (0.04)	-0.0138* (0.00)	0.1677 (0.26)

AG	1.3939 (0.23)	-0.0179 (0.65)	1.1915 (0.19)	1.4137 (0.22)	-0.0184 (0.64)	1.2051 (0.188)	1.3902 (0.235)	-0.0260 (0.52)	1.0888 (0.22)	1.4148 (0.23)	-0.0198 (0.82)	1.1893 (0.19)	1.3983 (0.23)	-0.2182 (0.59)	1.1503 (0.20)
COVID	-0.1359 (0.70)	-0.0016 (0.89)	-0.1541 (0.63)	-0.1300 (0.71)	-0.0018 (0.88)	-0.1505 (0.64)	-0.1317 (0.712)	-0.0025 (0.83)	-1.6109 (0.61)	-0.1323 (0.71)	-0.0027 (0.82)	-0.1635 (0.61)	-0.1321 (0.71)	-0.0023 (0.84)	-0.1586 (0.62)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.85	0.05	0.87	0.85	0.05	0.87	0.85	0.07	0.87	0.85	0.06	0.87	0.85	0.06	0.87
F-stat	113.62* (0.00)	4.59* (0.00)	100.77* (0.00)	114.54* (0.00)	4.47* (0.00)	100.29* (0.00)	113.11* (0.00)	6.57* (0.00)	101.08* (0.00)	113.99* (0.00)	6.42* (0.00)	100.57* (0.00)	113.28* (0.00)	16.84* (0.00)	101.14* (0.00)
Cook Weisberg	3252.09* (0.00)	275.48* (0.00)	4869.31* (0.00)	3250.83* (0.00)	286.38* (0.00)	4864.9* (0.00)	3231.59* (0.00)	322.09* (0.00)	4828.95* (0.00)	3249.84* (0.00)	280.15* (0.00)	4891.16* (0.00)	3236.31 (0.00)	239.43* (0.00)	4848.65* (0.00)

Dependent Variable (FD): Financial Distress (EMZSCORE). Mediating Variable (STDTA): Short-Term Leverage (Short-Term Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table reports the results of the mediation analysis using Pooled OLS with robust standard errors. It tests the mediating effect of Short-Term Leverage (STDTA) on the relationship between ownership structures and Financial Distress (FD). Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. All models include year, firm, and industry fixed effects.

Table 9. Mediation analysis- Ownership structure, total leverage, and financial distress (PCSE)

Model	**INSTO, total leverage, and financial distress**			**OWNC, total leverage, and financial distress**			**INSDO, total leverage and financial distress**			**FRNO, total leverage, and financial distress**			**GOVO, total leverage, and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)	FD β(sig)	TDTA β(sig)	FD β(sig)
cons	-1.3428 (0.44)	0.3379* (0.00)	2.0372 (0.28)	-1.1548 (0.53)	0.3039* (0.00)	1.8816 (0.35)	-1.6024 (0.40)	0.2246* (0.00)	0.6932 (0.72)	-1.2748 (0.47)	0.3216* (0.00)	1.9609 (0.30)	-1.5378 (0.40)	0.3014* (0.00)	1.4799 (0.44)
INSTO	-0.9115 (0.53)	0.1410* (0.01)	0.4956 (0.65)												
OWNC				-1.9023 (0.68)	0.0382 (0.18)	0.1914 (0.69)									
INSDO							0.3602 (0.45)	0.1071* (0.00)	1.4552* (0.00)						
FRNO										-0.3363 (0.31)	-0.1099* (0.00)	-1.443** (0.04)			
GOVO													-0.7845 (0.58)	-0.0690* (0.00)	-1.4760 (0.29)
TDTA			-10.001* (0.00)			-9.9891* (0.00)			-10.221* (0.00)			-10.059* (0.00)			-10.012* (0.00)
CR	1.0357* (0.00)	-0.0020* (0.00)	1.0155* (0.00)	1.0358* (0.00)	-0.0020* (0.00)	1.0154* (0.00)	1.0364* (0.00)	-0.0018* (0.00)	1.0173* (0.00)	1.0358* (0.00)	-0.0020* (0.00)	1.0152* (0.00)	1.0363* (0.00)	-0.0020* (0.00)	1.0162* (0.00)
ROA	0.1152* (0.00)	-0.0035 (0.11)	0.07942* (0.00)	0.1152* (0.00)	-0.0035 (0.11)	0.0794* (0.00)	0.1149* (0.00)	-0.0036 (0.10)	0.0778 (0.00)	0.1153* (0.00)	-0.0035 (0.12)	0.0799* (0.00)	0.1147* (0.00)	-0.0036 (0.11)	0.0786* (0.00)
AT	-0.5379* (0.00)	0.0160* (0.00)	-0.377** (0.03)	-0.5387* (0.00)	0.0161* (0.00)	-0.377** (0.03)	-0.5418* (0.00)	0.0153* (0.00)	-0.385** (0.03)	-0.5406* (0.00)	0.0156* (0.00)	-0.383** (0.03)	-0.5280* (0.00)	0.0171* (0.00)	-0.356** (0.05)
SIZE	0.3171* (0.00)	-0.006** (0.03)	0.2599* (0.01)	0.3073* (0.00)	-0.0042 (0.11)	0.2649* (0.01)	0.3218* (0.00)	0.0005 (0.83)	0.3270* (0.00)	0.3084* (0.00)	-0.0033 (0.19)	0.2742* (0.00)	0.3248* (0.00)	-0.0024 (0.38)	0.3003* (0.00)
AG	1.3939 (0.32)	0.0437 (0.48)	1.8316 (0.23)	1.4137 (0.32)	0.0408 (0.49)	1.8221 (0.24)	1.3902 (0.33)	0.0320 (0.61)	1.7175 (0.27)	1.4148 (0.32)	0.0392 (0.52)	1.8096 (0.24)	1.3983 (0.32)	0.0384 (0.53)	1.7831 (0.25)

COVID	-0.1359 (0.28)	0.0046 (0.70)	-0.0896 (0.57)	-0.1300 (0.30)	0.0037 (0.74)	-.0924 (0.56)	-0.1317 (0.29)	0.0029 (0.81)	-0.1019 (0.54)	-0.1323 (0.28)	0.0026 (0.82)	-0.1057 (0.515)	-0.1321 (0.28)	0.0033 (0.77)	-0.0984 (0.54)
R-square	0.85	0.07	0.88	0.85	0.07	0.88	0.85	0.08	0.88	0.85	0.07	0.88	0.85	0.07	0.88
Wald χ^2	334.06* (0.00)	123.19* (0.00)	1501.32* (0.00)	285.71* (0.00)	122.10* (0.00)	1330.21* (0.00)	277.66* (0.00)	182.63* (0.00)	1289.89* (0.00)	286.73* (0.00)	122.64* (0.00)	1239.14* (0.00)	278.67* (0.00)	144.73* (0.00)	1275.48* (0.00)

Dependent Variable (FD): Financial Distress (EMZSCORE). Mediating Variable (TDTA): Total Leverage (Total Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table presents the results of the mediation analysis using Panel-Corrected Standard Errors (PCSE) regression as a robustness check. This method accounts for both heteroscedasticity and contemporaneous correlation across panels. It tests the mediating effect of Total Leverage (TDTA) on the relationship between ownership structures and Financial Distress (FD). The models correspond to Equations 2, 3, and 6. Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. The Wald χ^2 statistic tests the overall significance of the model.

Table 10. Mediation analysis- Ownership structure, Long-term leverage, and financial distress (PCSE)

Model	**INSTO, long-term leverage, and financial distress**			**OWNC, long-term leverage, and financial distress**			**INSDO, long-term leverage, and financial distress**			**FRNO, long-term leverage, and financial distress**			**GOVO, long-term leverage, and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)	FD β(sig)	LTDTA β(sig)	FD β(sig)
cons	-1.3428 (0.44)	-0.1090* (0.00)	-2.0756 (0.22)	-1.1548 (0.53)	-0.1211* (0.00)	-1.9719 (0.28)	-1.6024 (0.40)	-0.1318* (0.00)	-2.4959 (0.18)	-1.2748 (0.47)	-0.1180* (0.00)	-2.0728 (0.23)	-1.5378 (0.40)	-0.1029* (0.00)	2.2301 (0.23)
INSTO	-0.9115 (0.53)	0.0961* (0.00)	-0.2685 (0.84)												
OWNC				-1.9023 (0.68)	0.0066 (0.70)	-0.1454 (0.73)									
INSDO							0.3602 (0.45)	0.0152** (0.02)	0.4679 (0.34)						
FRNO										-0.3363 (0.31)	-0.1896 (0.13)	-0.4645 (0.20)			
GOVO													-0.7845 (0.58)	0.0413 (0.15)	-0.5064 (0.712)
LTDTA			-6.7255* (0.00)			-6.7433* (0.00)			-6.7788* (0.00)			-6.7584* (0.00)			-6.7277* (0.00)
CR	1.0357* (0.00)	-0.0001* (0.06)	1.0345* (0.00)	1.0358* (0.00)	-0.0001** (0.03)	1.0345* (0.00)	1.0364* (0.00)	-0.0001* (0.07)	1.0353* (0.00)	1.0358* (0.00)	-0.0001** (0.04)	1.0345* (0.00)	1.0363* (0.00)	-0.0002** (0.02)	1.0348* (0.00)
ROA	0.1152* (0.00)	-0.0020* (0.00)	0.1013* (0.01)	0.1152* (0.00)	-0.0020* (0.00)	0.1013* (0.01)	0.1149* (0.00)	-0.0020* (0.00)	0.1009* (0.01)	0.1153* (0.00)	-0.0020* (0.00)	0.1014* (0.01)	0.1147* (0.00)	-0.0020* (0.00)	0.1010* (0.01)
AT	-0.5379* (0.00)	0.0119* (0.00)	-0.4573* (0.01)	-0.5387* (0.00)	0.0120* (0.00)	-0.4572* (0.01)	-0.5418* (0.00)	0.0119* (0.00)	-0.4608* (0.01)	-0.5406* (0.00)	0.0119* (0.00)	-0.4596* (0.01)	-0.5280* (0.00)	0.0115* (0.00)	-0.4506* (0.01)
SIZE	0.3171* (0.00)	0.0112* (0.00)	0.3925* (0.00)	0.3073* (0.00)	0.0123* (0.00)	0.3903* (0.00)	0.3218* (0.00)	0.0129* (0.00)	0.4099* (0.00)	0.3084* (0.00)	0.0124* (0.00)	0.3926* (0.00)	0.3248* (0.00)	0.0113* (0.00)	0.4013* (0.00)
AG	1.3939 (0.32)	0.0617** (0.03)	1.8031 (0.24)	1.4137 (0.32)	0.0593** (0.04)	1.8141 (0.24)	1.3902 (0.33)	0.0580** (0.04)	1.7840 (0.24)	1.4148 (0.32)	0.0590** (0.04)	1.8142 (0.23)	1.3983 (0.32)	0.0602** (0.04)	1.8037 (0.24)
COVID	-0.1359 (0.28)	0.0062 (0.26)	-0.0939 (0.41)	-0.1300 (0.30)	0.0055 (0.29)	-0.0924 (0.42)	-0.1317 (0.29)	0.0054 (0.30)	-0.0947 (0.40)	-0.1323 (0.28)	0.0053 (0.31)	-0.0959 (0.39)	-0.1321 (0.28)	0.0057 (0.28)	-0.0938 (0.40)
R-square	0.85	0.08	0.86	0.85	0.07	0.86	0.85	0.07	0.86	0.85	0.07	0.86	0.85	0.07	0.86

Wald χ^2	334.06* (0.00)	234.08* (0.00)	1065.43* (0.00)	285.71* (0.00)	330.69* (0.00)	848.27* (0.00)	277.66* (0.00)	273.17* (0.00)	704.21* (0.00)	286.73* (0.00)	282.57* (0.00)	742.03* (0.00)	278.67* (0.00)	322.44* (0.00)	720.75* (0.00)

Dependent Variable (FD): Financial Distress (EMZSCORE). Mediating Variable (LTDTA): Long-term Leverage (Long-Term Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table presents the results of the mediation analysis using Panel-Corrected Standard Errors (PCSE) regression as a robustness check. This method accounts for both heteroscedasticity and contemporaneous correlation across panels. It tests the mediating effect of Long-Term Leverage (LTDTA) on the relationship between ownership structures and Financial Distress (FD). The models correspond to Equations 2, 4, and 7. Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. The Wald χ^2 statistic tests the overall significance of the model.

Table 11. Mediation analysis- Ownership structure, Short-term leverage, and financial distress (PCSE)

Model	**INSTO, Short-term leverage, and financial distress**			**OWNC, Short-term leverage, and financial distress**			**INSDO, Short-term leverage, and financial distress**			**FRNO, Short-term leverage, and financial distress**			**GOVO, Short-term leverage, and financial distress**		
Steps	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**	**1st**	**2nd**	**3rd**
Dependent variable	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)	FD β(sig)	STDTA β(sig)	FD β(sig)
cons	-1.3428 (0.44)	0.4469* (0.00)	3.6942** (0.06)	-1.1548 *0.53)	0.4251* (0.00)	3.6412** (0.08)	-1.6024 (0.40)	0.3564* (0.00)	2.5188 (0.22)	-1.2748 (0.47)	0.4397* (0.00)	3.721*** (0.06)	-1.5378 (0.40)	0.4043* (0.00)	3.0573 (0.12)
INSTO	-0.9115 (0.53)	0.0449 (0.21)	-0.4095 (0.73)												
OWNC				-1.9023 (0.68)	0.0315** (0.04)	0.1659 (0.73)									
INSDO							0.3602 (0.45)	0.0918* (0.00)	1.4223* (0.00)						
FRNO										-0.3363 (0.31)	-0.0910* (0.01)	-1.370** (0.05)			
GOVO													-0.7845 (0.58)	-0.1104* (0.00)	-2.0393 (0.18)
STDTA			-11.269* (0.00)			-11.281* (0.00)			-11.563* (0.00)			-11.361* (0.00)			-11.365* (0.00)
CR	1.0357* (0.00)	-0.0018* (0.00)	1.0149* (0.00)	1.0358* (0.00)	-0.0018* (0.00)	1.0149* (0.00)	1.0364* (0.00)	-0.0017* (0.00)	1.0167* (0.00)	1.0358* (0.00)	-0.0018 (0.00)	1.0146* (0.00)	1.0363* (0.00)	-0.0017* (0.00)	1.0159* (0.00)
ROA	0.1152* (0.00)	-0.0015 (0.49)	0.09820* (0.00)	0.1152* (0.00)	-0.0015 (0.49)	0.0980* (0.00)	0.1149* (0.00)	-0.0015 (0.47)	0.0968* (0.00)	0.1153* (0.00)	-0.0014 (0.51)	0.0986* (0.00)	0.1147* (0.00)	-0.0015 (0.48)	0.0969* (0.00)
AT	-0.5379* (0.00)	0.0040 (0.32)	-0.4918* (0.006)	-0.5387* (0.00)	0.0040 (0.31)	-0.4924* (0.00)	-0.5418* (0.00)	0.0033 (0.40)	-0.5026* (0.00)	-0.5406* (0.00)	0.0036 (0.37)	-0.4989* (0.00)	-0.5280* (0.00)	0.0056 (0.17)	-0.4635* (0.01)
SIZE	0.3171* (0.00)	-0.0169* (0.00)	0.1263 (0.23)	0.3073* (0.00)	-0.0165* (0.00)	0.1205 (0.26)	0.3218* (0.00)	-0.0124* (0.00)	0.1775 (0.11)	0.3084* (0.00)	-0.0158* (0.00)	0.1283 (0.23)	0.3248* (0.00)	-0.0138* (0.00)	0.1677 (0.12)
AG	1.3939 (0.32)	-0.0179 (0.72)	1.1915 (0.39)	1.4137 (0.32)	-0.0184 (0.70)	1.025 (0.39)	1.3902 (0.33)	-0.0260 (0.61)	1.0888 (0.44)	1.4148 (0.32)	-0.0198 (0.69)	1.1893 (0.39)	1.3983 (0.32)	-0.0218 (0.66)	1.1503 (0.41)

COVID	-0.1359 (0.28)	-0.0016 (0.91)	-0.1541 (0.47)	-0.1300 (0.30)	-0.0018 (0.90)	-0.1505 (0.48)	-0.1317 (0.29)	-0.0025 (0.86)	-0.1610 (0.47)	-0.1323 (0.28)	-0.0027 (0.85)	-0.1635 (0.45)	-0.1321 (0.28)	-0.0023 (0.87)	-0.1586 (0.46)
R-square	0.85	0.05	0.87	0.85	0.05	0.87	0.85	0.07	0.87	0.85	0.06	0.87	0.85	0.06	0.87
Wald χ^2	334.06* (0.00)	431.89* (0.00)	1751.61* (0.00)	285.71* (0.00)	361.61* (0.00)	1643.05* (0.00)	277.66* (0.00)	397.02* (0.00)	1520.59* (0.00)	286.73* (0.00)	408.43* (0.00)	1506.60* (0.00)	278.67* (0.00)	495.14* (0.00)	1593.27* (0.00)

Dependent Variable (FD): Financial Distress (EMZSCORE). Mediating Variable (STDTA): Short-term Leverage (Short-Term Debt / Total Assets). Independent Variables: INSTO (Institutional Ownership), OWNC (Ownership Concentration), INSDO (Insider Ownership), FRNO (Foreign Ownership), GOVO (Government Ownership). Controls: CR (Current Ratio), ROA (Return on Assets), AT (Asset Tangibility), SIZE (Firm Size), AG (Asset Growth), COVID (Dummy variable).

Note: This table presents the results of the mediation analysis using Panel-Corrected Standard Errors (PCSE) regression as a robustness check. This method accounts for both heteroscedasticity and contemporaneous correlation across panels. It tests the mediating effect of Short-Term Leverage (STDTA) on the relationship between ownership structures and Financial Distress (FD). The models correspond to Equations 2, 5, and 8. Regression coefficients are reported with p-values in parentheses. *, **, and *** denote statistical significance at the 1%, 5%, and 10% levels, respectively. The Wald χ^2 statistic tests the overall significance of the model.