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FINANCIAL ECONOMICS | RESEARCH ARTICLE

The determinants of financial distress cost: A case of emerging market

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Abstract: This study analyses the cost of financial distress of non-financial firms listed on the Pakistan stock exchange. Furthermore, it considers the moderating role of concentrated ownership in the relationship between debt and expected financial distress costs. We used the panel data of 214 firms from 2010 to 2018 to analyse the results. We apply fixed effect model to test the hypotheses. We find that exante financial distress costs are based not only on the probability of financial distress but also affect the amount of time and money spent during the distress period. The use of tangible fixed assets and long-term leverage lowers the cost of





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PUBLIC INTEREST STATEMENT

Financial distress refers to a company's vulnerable financial position, which may lead to bankruptcy. Due to financial difficulties, a large number of businesses have closed their doors around the world. Furthermore, the situation is worse in developing countries. Financial distress harms business profitability, reduced firm value, and jeopardized business continuity. As a result, it is critical to understand the factors that contribute to financial distress at the firm level, as well as the costs that firms must bear when financial distress occurs. Furthermore, the level of intangible assets, long term credit, and short term credit inversely affects the cost of financial distress. Knowledge of these firm-related characteristics may assist managers in taking appropriate measures to reduce financial distress cost and thus avoid potential bankruptcies. Further, in addition to firm-related variables, the role of concentrated ownership is very common in the relationship between leverage and financial distress especially in developing countries.





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financial distress, whereas the use of short-term debt has no significant impact on the cost of financial distress. Furthermore, the company's ownership structure dampens the impact of these factors. Corporate management may reduce the cost of financial distress through better management of fixed assets and financial leverage.

Subjects: Finance; Corporate Finance; Corporate Governance

Keywords: financial distress cost; financial distress likelihood; collateral; interest coverage ratio

JEL Classification: G32; M41.

1. Introduction

Financial distress (FD) has received a great deal of attention in the literature due to the negative consequences it has on both the microeconomic and macroeconomic levels. Many stakeholders suffer as a result of a company's FD, ranging from the company's shareholders to its employees, customers, suppliers, financial institutions, and society in general (Munoz-Izquierdo et al., 2020). FD threatened business profitability and lowered the firms' value (Kazemain et al., 2017). Because FD threatens business continuity, scholars, academics, and practitioners are interested in learning what factors contribute to FD at the firm level and the costs that firms must bear after FD occurs.

In the literature, FD has been defined in different ways. FD is defined as a company's inability to meet its debt obligations, which may lead to bankruptcy, liquidation, or another type of asset seizure and distribution. According to Gordon (1971), FD occurs when a company's current debts cannot be serviced. In support of the above definition, Ikpesu (2019) stated that a firm is in FD when it is unable to meet its financial obligations. In a different vein, Ray (2011) contends that a firm is in FD when it breaches loan contracts and suffers continuous losses while remaining unable to pay obligations when they become due. FD is characterised as a business's failure to pay its debts, which may result in bankruptcy, liquidation, or another sort of asset seizure and distribution. (Sun et al., 2002). Firms in financial distress must meet higher costs than normal firms. The costs, which traditionally include both direct and indirect costs, may reduce the firm's value. Direct costs incurred during the legal bankruptcy process, such as attorney's fees, administrator's remuneration, or other legal fees (Dou et al., 2021). Indirect costs are hidden losses incurred by businesses as a result of temporary liquidity issues (U. Farooq & Jibran, 2018). Warner (1977) studied 11 U.S. railroad companies from 1933 to 1955 and discovered that FD reduced the firm's value by 1% to 5.3% of the firm's value. Accessing financial distress has long been recognised as a vital part of banks' and other financial institutions' credit risk management processes. Altman et al. (2017) assert that a rising body of research has addressed FD among firms over the previous four decades, due to the issue's significance.

The current study focuses on financial distress because it is thought to be the primary cause of insolvency and the least effective method of leaving a firm's business. According to Volkov et al. (2017), bankruptcy is the final stage of financial distress. Financial distress, according to the literature, is a stage between bankrupt and healthy firms in which firms do not take sufficient steps to comply with their financial contracts. A bankrupt firm is referred to as insolvent, whereas financially distressed firms may not become insolvent and can recover from this state. Volkov et al. (2017) argue that bankruptcy is the final stage of financial distress when firms have no way to come out of it. Lower equity, increased capital, and the absence of structured debt increase the likelihood of the firm exiting the business voluntarily rather than going bankrupt. As a result, the asset structure and liability composition of firms have a significant impact on the success of voluntary restructuring.

There are very few studies in the literature on the costs of financial distress. Keasey et al. (2015) conducted a study on SMEs in five different countries to calculate the cost of financial distress. Quintiliani (2017) conducted another noteworthy study, calculating the financial distress cost of Italian SMEs. There is no study available that targets non-financial manufacturing firms to compute distress costs in general and in an emerging market in particular. Further, we extend our analysis, by analyzing the moderating impact of concentrated ownership in leverage (both shortterm and long-term credit) and financial distress relationship. Ownership concentration is high in emerging markets (Hunjra et al., 2020). According to research, concentrated ownership had a mixed impact on financial distress. Large shareholders, according to Shleifer and Vishny (1986), are motivated to effectively monitor management and have sufficient incentives to maximise firm value by reducing information asymmetries (Claessens et al., 2002), which reduces agency issues and saves the firm from financial distress. According to AlHares (2019), financial distress is inversely related to ownership concentration. However, ownership concentration may result in information asymmetry between large and minority shareholders (Jensen, 1993), allowing large shareholders to influence and steer management in their favour (La Porta et al., 2000), increasing the likelihood of financial distress for companies (Donker et al., 2009). The Pakistani corporate sector is characterised by high levels of concentration of ownership (Samanta, 2019). As a result, it is expected that this concentration of ownership will have a significant impact on the costs of financial distress. In Pakistan, no study has been conducted to investigate the role of ownership concentration in the context of financial distress costs. As a result, there is a gap in this context that we are attempting to fill. Furthermore, the corporate governance mechanism, legal system, and financial disclosure requirements in emerging markets differ from those in developed and advanced countries (Younas et al., 2021). There have been several bankruptcies in Pakistan over the previous two decades (Rashid & Abbas, 2011). Pakistan, like the rest of the globe, faced financial difficulties throughout the crisis, but this was most apparent in 1972 and 2012 when the PSX laid off 58 and 62 enterprises, respectively (Khurshid et al., 2018). M. Faroog et al. (2020) discovered that 47 non-financial PSX-listed firms had negative equity in 2015. These businesses are still in operation, but they are experiencing severe financial difficulties, which may result in higher indirect costs. Because of the large number of firms, it is critical to investigate the magnitude and determinants of indirect costs in a developing country like Pakistan. As an Asian emerging market, Pakistan's corporate governance mechanism, with its unique institutional background, concentrated ownership, family-controlled firms, and Anglo-governance model, creates a different business environment than that of developing countries (Samanta, 2019). Additionally, the Pakistani economy's distinctive characteristics, including political instability, director interlocking, pyramid ownership, and proxy directorship, subject enterprises to financial trouble. All of these characteristics contribute to a welcoming environment for studying in Pakistan. There is a gap in the literature because no study has looked at the moderating effect of concentrated ownership on capital structure and FD costs.

To achieve this research objective, we use Keasey et al. (2015)'s model to jointly determine the expected cost of FD in two steps: first, we measure the likelihood of financial distress (FDL), and then we calculate the expected loss of financial distress firms. In addition, we broaden our analysis by investigating the role of literature regarding the impact of ownership concentration on financial distress costs. The study's findings are useful to financial institutions, financial intermediaries, risk capitalists, and investors. Furthermore, findings can help policymakers formulate policies, especially during times of financial crisis. Finally, firm management can use the findings in the ex-ante prediction of financial distress to devise a plan and corrective action to save the firm from these unfavourable events.

The remainder of the article is organised as follows: the literature review section comprises financial distress costs: probability and effects are discussed in Section 2; data and econometric methodology are discussed in Section 3; findings are discussed in Section 4; the conclusion is presented in Section 5.

2. Literature review

2.1. The determinants of ExpFDC

After calculating the risk of FD, we assess the cost of conducting business in a crisis at the second level. According to Keasey et al. (2015), we used three key determinants of the ExpFDC, namely, the number of tangible assets as it tests the company's capacity to access credit by providing physical assets in exchange for credit as collateral, the presence of long-term and immediate debt in the capital structure as beneficial in having relief from financial distress while also mitigating information asymmetry.

2.1.1. The financial distress

The likelihood of financial distress increases the costs associated with it; this likelihood is the main driver of these costs. The estimation of this likelihood is still poorly understood, hence it is customary to investigate this problem using an empirical strategy like Altman's (1968) Z-Score model. Udin et al. (2017) used the Altman Z-score to assess the likelihood of financial distress to investigate the impact of ownership structure on FD. Ashraf et al. (2019) recently conducted a comparative study on a sample of PSX-listed firms from 2001 to 2015, using five different financial distress prediction models: Altman Z-score (1968), Ohlson (1980) O-score model, Zmijewski (1984) Probit model, Shumway (2001)'s Hazard Model, and Blums (2003) D-Score Model. Pindado et al. (2008) assess the probability of financial distress using a panel data approach and produce a more stable model of the FDL when applied to various nations in terms of the magnitude, sign, and significance of the coefficients. The likelihood of a corporation experiencing financial trouble is captured by the (Pindado et al., 2008) model. The FDL variable is derived from the aforementioned proposed logistic regression model, and as a result, it has a range of 0 to 1, which is consistent with the expected probabilities. The likelihood that the FDL will have a favorable effect on the ExaFDC in this scenario is negligible.

H1: There is a positive relationship between financial distress likelihood and expected FD costs.

2.1.2. The proportion of tangible fixed assets to total assets

Corporate assets can be used as collateral to secure funds in times of need (Pistor, 2019). According to Psillaki and Daskalakis (2009), fixed tangible assets are important determinants of the capital structure of European SMEs. In the case of China, Newman et al. (2012) report the same thing. Pindado et al. (2006) go on to explain how asset structure affects capital structure in the face of FD. The more tangible assets there are, the more likely they can be used as security to raise funds to restructure the business. Furthermore, greater tangible assets reduce informational obscurity, increasing the likelihood of reformation and, as a result, lowering the risk of financial distress (Keasey et al., 2015). In the case of smaller businesses, these assets lose more value as they negotiate in difficult market conditions. According to Shleifer & Vishny, 1986), during a recession, customers will only buy at a discount. The seller of a distressed firm becomes hesitant and delays until the market becomes more liquid. The firm's bankruptcy risk decreases as its tangible assets increase. Overall, the tangible fixed assets variable (TFA_{it}) is defined as the proportion of tangible fixed assets to total assets. Based on the above discussion, we developed the hypothesis as follows:

H2: There should be an inverse relationship between tangible fixed assets and expected FD costs.

2.1.3. Long-term leverage

Long-term leverage in capital structure is a major component of financial distress costs and predicts a positive impact on FD costs (Andrade & Kaplan, 1998). According to Berger and Udell (1998), the larger the long-term borrowing, the greater the borrower's financial risk potential. Opler

and Titman (1994) argued that during a recession, highly leveraged firms lose their businesses and operating margins. M. Farooq et al. (2020) contended that leverage is also negatively associated with firm market value. Konstantaras and Siriopoulos (2011) examined 4,161 annual observations of Greek-listed firms between 1994 and 2009 using a dynamic nonlinear model (conditional maximum likelihood estimation). Findings revealed that firms that had low profitability, high accumulated losses, and high financial leverage were more likely to fail. In the same vein, Mselmi et al. (2017) used several statistical methods to analyse a sample of 106 distressed SMEs matched with 106 non-distressed SMEs in France from 2012 to 2013. Low profitability, liquidity, and financial leverage were found in financially distressed firms. They were smaller than non-financially distressed firms, had low repayment capacity, and low solvency ratios. In a 1988–2010 sample of 800 publicly traded US restaurants, Chen (2011) found that higher leverage increases the likelihood of financial distresse.

Furthermore, the level of technology used in any sector frequently influences leverage. The greater the level of technology, the greater the investment financing requirement and, consequently, the greater the level of possible leverage in the firm's capital structure. According to Mehmood et al., 2019), business growth is determined by the firm's capital structure. Researchers like Keasey et al. (2015), Mselmi et al. (2017), Quintiliani (2017), and Yazdanfar and Öhman (2020) argued that long-term debt increases the likelihood of a firm incurring financial distress costs. As a result, Waqas et al. (2018) predict a positive relationship between long-term debt and ExpFDC. However, Öhman and Yazdanfar (2017) reported that leverage increases financial stability in financial institutions. We developed the following hypothesis:

H3: Long-term leverage is positively associated with the expected FD cost.

2.1.4. The proportion of short-term debt

Greater information asymmetry of client details allows for more expensive fund procurement and is frequently associated with higher monitoring costs (Berger & Udell, 1998). Short-term credit is critical in addressing the issues of information asymmetry and borrower risk. According to Molina and Preve (2012), the increase in immediate leverage in total funding creates an opportunity for the supplier to expand trade finance to provide a financial solution to distressed firms. As a result, the availability of this credit will reduce the cost of FD. Lee et al. (2018) added that when financial distress occurs, suppliers grant trade credit, lowering the cost of financial distress. Wilner (2000) and Cunat (2007) examined trade credit in terms of customer FD costs and discovered that it reduced the cost of financial distress while also saving businesses from insolvency and bankruptcy. Another notable study was conducted by Lizares and Bautista (2021) on the Philippines' 263 publicly listed non-banking firms for the period from 1995 to 2018. They found that short-term leverage has a significant negative impact on the likelihood of financial distress.

Short-term (immediate) debt is defined in this study as the amount of trade credit extended by suppliers and short-term financing obtained by firms through term loans. Because the incentives for suppliers to extend credit to distressed firms and the availability of trade credit reduce the impact of financial distress, short-term debt is expected to be inversely related to ExaFDC. Based on the previous discussion, we developed the following hypothesis:

H4: There is an inverse relationship between short-term credit and expected FD cost.

2.2. The moderating effect of concentrated ownership

After investigating the determinants of financial distress costs, we further extend our analysis by examining one component of corporate governance, i.e. concentrated ownership in this relationship. Mariano et al. (2021) argued that corporate governance and characteristics could have

a strong influence on firm performance and financial distress. According to Hunjra et al. (2016), the ownership structure is an important corporate governance mechanism. Financial distress results from poor corporate governance (Dibra, 2016). Ownership has two implications: ownership structure and ownership concentration (Yasser & Al Mamun, 2015). Since the 1990s, researchers around the world have observed the prevalence of concentrated ownership (La Porta et al. 1999), and there is an ongoing concern among researchers that minority shareholders may be expropriated by majority shareholders (Solarino & Boyd, 2020). Large shareholders have been identified as potentially costly because they have different goals than small shareholders and can exploit them.

There is still no well-established argument in the literature as to the type of business ownership arrangement that is best suited for making reasonable decisions to limit opportunistic behaviour over the life cycle of a corporation (Toms, 2013). Several studies have been conducted to determine how the composition of ownership affects the debt ratio (e.g., (De Miguel et al., 2005). Tayachi et al. (2021) investigated the impact of ownership structure on dividend and financing policies in manufacturing firms in both developed and developing countries from 2010 to 2019. They discovered that ownership concentration has a significant impact on firm financing decisions using the generalised method of moments (GMM). Lin et al. (2013) propose a missing correlation between debt maturity and the cost of financial distress to investigate the moderating effect of ownership. The financial literature, on the other hand, investigates the effects of ownership may have a moderating effect on the association.

As García-Teruel and Martínez-Solano (2007) demonstrate, both long-term and short-term debt serve as a substitute to some extent. We contend that the form of ownership may prejudice this substitutability, particularly during times of depression. Through a less fragmented ownership base, an independent management team may be able to respond to financial problems in a more pragmatic manner, helping to avoid the opportunism of powerful shareholders (Poletti-Hughes & Ozkan, 2014). As a result, companies with less consolidated ownership have a better chance of surviving the financial crisis. In contrast, AlHares (2019) discovers that ownership concentration is negatively associated with financial distress. Mariano et al., 2021) find that highly concentrated firms are less likely to face financial distress, which is consistent with the preceding arguments.

According to Shleifer and Vishny (1986), large shareholders are motivated to effectively monitor management, which reduces agency issues and saves the firm from financial distress. Large shareholders have sufficient incentives to maximise firm value by reducing information asymmetries and assisting in the resolution of agency problems (Claessens et al., 2002), thereby reducing the firm's financial distress costs. Some studies, on the other hand, contend that ownership concentration may result in information asymmetries between large and minority shareholders (Jensen, 1993). According to Hunjra et al. (2020), ownership concentration in emerging markets leads to increased information asymmetry. As a result, large shareholders may wield influence over management and thus steer it in their favour, regardless of the interests of minority shareholders (La Porta et al., 2000). Minority shareholders may face expropriation of their wealth in this case, increasing the likelihood of financial distress for companies (Donker et al., 2009). In short, the ownership arrangement is intended to have a minor impact on the partnership between financial distress costs and business financial arrangements.

H5: Ownership concentration moderates the relationship between long-term credit and expected financial distress costs.

H5: The relationship between expected financial distress and short-term credit is moderated by ownership concentration.

Figure 1. Theoretical framework of the study.



2.3. Theoretical framework

Based on the literature review, the proposed model of financial distress cost is presented in Figure 1. The model shows that Tangible Fixed Assets, Financial Distress likelihood, Long Term Credit and Short term credit affect the Expected Financial Distress Cost whereas ownership concentration moderates the relationship between Long Term Credit, Short Term credit and Expected financial distress cost.

3. Data and estimation methodology

3.1. Data

The current research focuses on non-financial companies. Financial firms were excluded from the sample due to significant differences in financial reporting, accounting rules, and regulations. Such variations may affect the precision of accounting measures (Shahwan, 2015). To participate in the study, firms must meet the following selection criteria. Specifically, the company must remain listed on the Pakistan Stock Exchange (PSX) throughout the study period, i.e., from 2010 to 2018, financial statement data must be available throughout the period, and the company may not be delisted, merged, or acquired during the period. Based on the sample criteria listed above, the study's final sample includes 214 firms. The distribution of the sample firms by sector is shown in Table 1.

This study analysed secondary data from 2010 to 2018 from the sample businesses. The data was acquired through annual reports of reputable enterprises, the study of the State Bank of Pakistan's (SBP) balance sheet, open doors websites, and PSX historical data. The study employed annual data because, according to Xiaoqi (2013), annual data is preferable since factors are explained, and data is more thorough in annual reports. The data was compiled and placed in a panel format for examination. Baltagi et al. (2005) assert that panel data is well-suited for data processing since it has both time-series and cross-section dimensions. Additionally, STATA version 11 was utilised to analyse the data.

3.2. Measurement of variables

In this part, we will analyse the function of FDL and the total loss associated with managing a firm in distress to develop a model for examining the primary drivers of ex-ante financial distress costs (ExaFDC). As a result, the ExaFDC is calculated by multiplying the probability of financial distress by the cost of its occurrence. As a consequence, our approach may be written as an equation on the left with the FDL multiplied by the ExpFDC and the predicted financial distress costs expressed as a drop in a firm's revenue compared to its relevant industry and the length of distress on the right. On the other hand, U. U. Farooq et al. (2018) utilised a sample of 321 active, 54 suspended, and 91 delisted corporations to illustrate the multistage financial process, which comprises profit decrease, moderate liquidity (ML), and severe liquidity (SL). According to their results, when

lable 1. Sample Distribut	Ion				
Sr. #	Industrial Sector	*Total Listed Firms	**Final Sample	% of sector	% of Sample
1	Automobile and Parts	22	17	77	7.907
2	Cable and Electrical Goods	7	4	57	1.860
ε	Cement	20	15	75	6.977
4	Chemicals and Fertilisers	34	27	79	12.558
5	Engineering	17	7	41	3.256
7	Food and Personal Care products	20	18	100	8.372
8	Glass and Ceramics	6	5	56	2.326
6	Leather and Tanneries	5	2	40	0.930
10	Miscellaneous	22	8	36	3.721
11	Oil and Gas	16	14	87	6.512
13	Paper and Board	10	9	60	2.791
14	Pharmaceuticals	12	9	50	2.791
15	Power Generation and Distribution	19	7	37	3.256
16	Sugar and Allied Products	32	23	72	10.698
17	Synthetic and Rayon	11	9	55	2.791
18	Technology and Communication	11	9	55	2.791
19	Textile	146	38	27	18.140
20	Tobacco	S	2	67	0.930
21	Transport	4	2	50	0.930
22	Woolen	2	₹-1	50	0.465
	Grand Total (Non-financial)	422	214	51	100
Note: * Total number of listed fi	ms at PSF on December 31st 2018	** Finally selected sample of the	study after data screening and re	moving outliers	

confronted with ML in its early phases, healthy businesses are more likely to face SL. Businesses in trouble can always recover and become healthy, but recovering from SL is more difficult.

The ExaFDC costs are mainly unobservable and indirect. Following Altman (1984), we compute this decrease in value due to distress costs (ϕ) as the loss of firms' sales revenue compared to the relative industry. This model was chosen because the sample consists of companies from various industries, and it is the version developed by Altman for private and public manufacturing firms (Altman, 1984). Altman et al. (2017) argued that even though the Z-score model was developed more than 45 years ago and that many alternative failure prediction models exist, the Z-score model is still used globally as a main or supporting tool for bankruptcy or financial distress prediction and analysts both in research and in practice. Muñoz-Izquierdo et al. (2020) also use the same model in their study for the prediction of financial distress. Hamilton (2012), Opler and Titman (1994), and Bulot et al. (2017) computed this ϕ as the difference between the sales growth of an industry and the sales growth of a firm.

$$\emptyset = (\mathsf{GRS}_{\mathsf{industry}} - \mathsf{GRS}_{\mathsf{it}})$$

Where

 Φ = ex-ante cost of financial distress

GRS_{industry} = Growth rate of sale of an industry

 $GRS_{it} = Growth rate of a firm$

M. Farooq et al. (2020) use this approach in a local context to calculate the cost of financial distress (termed opportunity loss). However, ExaFDC's estimate in equation (1) catches the notion that agents are formulating assumptions not just regarding financial distress but also about the time the business would be experiencing its consequences. Consequently, in continuous time, we can consider the reduction of valuation through financial crisis (ExaFDC) as a discount element; this can be represented as follows:

$$\mathsf{ExaFDC} = \left(\mathbf{e}^{\emptyset}\right)^{\tau} = \left(\mathbf{e}^{\emptyset,\tau}\right) \tag{2}$$

The financial distress (FD) costs are directly proportional to the financial distress likelihood (FDL) because it is the primary source of financial distress costs (Keasey et al., 2015). The majority of studies in the literature used Altman (1968) Z-score approach to investigate this issue. Udin et al. (2017) used the Altman Z-score to assess the likelihood of financial distress to investigate the impact of ownership structure on FD. Ashraf et al. (2019) recently conducted a comparative study on a sample of PSX-listed firms from 2001 to 2015, using five different financial distress prediction models: Altman Z-score (1968), Ohlson (1980) O-score model, Zmijewski (1984) Probit model, Shumway (2001)'s Hazard Model, and Blums and Macalester (2004) D-Score Model. It was discovered that the Z-Score model predicts firm insolvency more accurately. According to the robustness check provided in the literature, there is a concern about the accuracy of identifying the identifying capacity of financially distressed companies (Grice & Ingram, 2001). Pindado et al. (2008) also use panel data techniques to examine FDL's more robust model in terms of the size, sign, and effect of the coefficient on various countries in the background. We use the same methodology as these authors to calculate the risk of financial distress.

$$log\left(\frac{Prob(insolvency)}{Prob(noinsolvency)}\right) = \beta_0 + \beta_1\left(\frac{EBIT_{it}}{TA_{i-1}}\right) + \beta_2\left(\frac{FE_{it}}{TA_{i-1}}\right) + \beta_3\left(\frac{RE_{it}}{TA_{i-1}}\right) + \varepsilon_{it}$$
(3)

(1)

Where

EBIT_{it} = Earnings before interest and taxes for firm i for time t

 $TA_{i-1} = Total$ assets at the beginning

 FE_{it} = Financial expenses for firm i for time t

RE = Retained earnings for firm i for time t.

 $\varepsilon_{it} = Residual$

 B_0 = Intercept for firm i for time t

Following Makeeva and Khugaeva (2018), we categorised the firm into financial distress and healthy firms based on the interest coverage ratio. It is calculated according to the following formula:

Interest Coverage Patie -	Earnings before interest,	taxes,	depreciation,	and amortization
Interest coverage katio =	ir	nterest	expenses	

As a result, the model employed a binary dependent variable that takes the value 1 if the interest coverage ratio is negative (financial distress firm) and 0 otherwise (Makeeva & Khugaeva, 2018).

Equation three was used to calculate the FDL with the help of three key variables. The first calculation, profits before interest and taxes divided by total assets in the prior period, assesses the company's ability to generate a profit from its assets, regardless of any tax or leverage factor. This ratio becomes more important during the debt rescheduling cycle because it demonstrates the organisation's ability to handle the financial costs associated with the cash flows generated by business activities. The second ratio depicts financial expenses and their impact on FDL. As this percentage rises, so does the likelihood of a company going bankrupt. Finally, the preceding fraction of retained earnings on total assets represents cumulative earnings over time and depicts the effectiveness of past profitability in predicting future financial results and self-financing capability.

By implementing the logistic regression formula, as the dependent variable ranges between 0 and 1, we obtained the variable likelihood of FD that would assess a company's FDL. As previously discussed, FD costs are calculated by multiplying the FDL by the costs of conducting a bankruptcy business. As previously stated, FDL is measured using equation three. In equation 3, the dependent variable is binary, taking the value one if the firm is in FD and zero otherwise. The sample observations were categorised based on the interest coverage ratio (Makeeva & Khugaeva, 2018). The criteria mentioned above were to divide the sample into distressed and healthy firms.

Long-term leverage is the book value of long-term debt availed by the company. It is measured long-term debt as a percentage of total assets. Short-term debt is the amount of short-term financing that the firm obtains from short-term loans and suppliers as a percentage of total assets.

Ownership concentration is a dummy variable that takes a value of 1 for businesses with a more diverse ownership structure and 0 otherwise, is used to assess the moderating influence of ownership.

3.3. Econometric model

Following the measurement of the FDL, we follow (Keasey et al., 2015) in calculating the ex-ante (expected) financial distress cost (ExaFDC), which is a product of the FDL and the cost is borne by a bankrupt firm, i.e., the ex-post financial distress cost (ExpFDC).

$$\varphi_{it} = \alpha_1 \ln FDL_{it} + \alpha_2 TFA_{it} + \alpha_3 LTLev_{it} + \alpha_4 STCred_{it} + \varepsilon_{it}$$
(4)

To deal with the possible heteroscedasticity issue, all variables are scaled by total assets.

The following equation is used to measure the moderating effect of concentrated ownership.

$$\begin{aligned} \varphi_{it} &= \alpha_1 lnFDL_{it} + \alpha_2 TFA_{it} + \alpha_3 LTLev_{it} + \alpha_4 STCred_{it} + \alpha_5 Con_Own_{it} + \alpha_6 LTLev_{it} * Con_Own_{it} \\ &+ \alpha_7 STCred * Con_Own_{it} + \varepsilon_{it} \end{aligned}$$

Where

 φ_{it} = proportion of the forgone sale of a firm relative to the industry

FDL_{it} = Financial distress likelihood for firm i for time t

- TFA_{it} = Total fixed assets for firm i for time t
- LTLev_{it} = Long-term leverage for firm i for time t
- STCred_{it} = Short-term credit for firm i for time t
- Con_Own_{it} = Concentrated ownership for firm i for time t

To test the robustness of our results, we add additional variables to equation 1 to control for potential omitted variable bias. The description of these variables is presented in Table 2.

3.4. Estimation methodology

Several tests are performed to determine the best model for the study. The Lagrange multiplier (LM) test can be used to select between the random effect model (REM) and the pooled OLS model. The LM test result indicated that REM is more appropriate, with a *p*-value 0.0001 less than 0.05. Furthermore, the Hausman test was used to select an appropriate model from the fixed-effect model (FEM) and the random-effect model (REM). The Hausman test result indicated that FEM is more appropriate, with a *p*-value less than 0.05, i.e., 0.047. As a result, FEM was used to conclude the findings of this study.

Table 2. Description of variable	les	
Variables Name	Symbol	Description
Firm size	Size	Log of Sale
Tobin's Q	TQ	(Market value of Equity + Book value of Debt)/Total Assets
Asset Intangibility	INTANG	(Total market value/book value of assets)* 100
Changes in Investment	CINV	[Net retained cash/(fixed assets +intangible assets+current assets)] * 100

(5)

4. Results

Table 3 shows that during the study period, approximately 40% of firm-year observations are classified as being in financial distress. Furthermore, because Altman's (1968) produces findings that are more susceptible to survivorship bias, using matching samples is more natural in financial distress forecasting. Using an unbalanced panel of companies, on the other hand, enables the development of a binary variable that is less susceptible to bias.

Table 4 displays the descriptive statistics for the variables used to calculate the costs of financial distress. The sample firms' average financial distress cost is 0.938, with a range of 0.013 to 3.21 times total assets. The tangible fixed assets of sample firms account for 44 percent of total assets on average, with a range of 6 percent to 87 percent of total assets. Short-term credit accounts for a larger proportion of total assets than long-term leverage (16.1% vs. 6.57%), indicating that longterm leverage has a higher transaction cost and information asymmetry. Antoniou et al. (2006) agree, claiming that because of higher information asymmetry and transaction costs, firms prefer short-term credit over long-term debt. Ownership concentration was measured using the Herfindahl-Hirschman Index, which is the squared sum of shares held by the top five shareholders. Five large investors own 65 percent of the sample firms' shares on average, with a minimum and maximum holding of 32.6 percent and 95 percent, respectively.

Table 5 shows the correlation analysis of the determinants of FD costs. It depicts the relationship between variables, whether they are positively or negatively associated with one another. Furthermore, the correlational analysis reveals whether or not multicollinearity exists in the data. According to Guirati (2003), if the correlation value between variables is greater than 0.80, there is a collinearity problem between variables. Regression results generated by such data may be biased and not generalizable. Table 5 's correlation coefficients show that no value exceeds the 0.80 threshold level, indicating that there is no collinearity in the data.

Table 6 also displays the VIF values of independent variables, indicating that there is no evidence of multicollinearity in the data.

As previously discussed, we used FEM based on the Hausman test results to conclude the study's findings. Regardless of the moderating effect of the ownership variable, the results from the base model support our initial conclusions. As shown in Table 7, FDL and ExaFDC have a significant positive relationship, supporting the hypothesis that FDL is the main explanatory variable of FD

coverage ratio)	aitny ana aistressed firms (basea on interest
Observations	Percentage of observation
Healthy	1156
Financial distressed	770
Total	1926

Table 4. Descri	iptive Statistics				
Variable	Obs	Mean	Std. Dev.	Min	Max
ExaFDC	1921	.938	.69	.013	3.21
LFDL	1921	.812	1.369	-1.89	3.339
TFA	1921	.445	.231	.062	.87
LTLev	1921	.076	.095	0	.324
STCred	1921	.161	.146	0	.464
Con_Own	1921	.657	.19	.326	.949

Table 5. Mat	rix of correlat	tions				
Variables	(1)	(2)	(3)	(4)	(5)	(6)
ExaFDC	1.000					
LFDL	0.044**	1.000				
TFA	0.078*	-0.211*	1.000			
LTLev	-0.174**	-0.197*	0.433	1.000		
STCred	0.016*	-0.268	0.183*	0.172*	1.000	
Con_Own	-0.011	0.173*	-0.095	-0.090**	-0.093*	1.000

*** p <.01, ** p <.05, * p <.1

Table 6. Variance inflation fac	tor	
	VIF	1/VIF
LFDL	1.143	.875
TFA	1.268	.789
LTLev	1.258	.795
STCred	1.105	.905
Con_Own	1.038	.964
Mean VIF	1.162	

costs. The greater the likelihood of FDL, the greater the financial distress costs. This backs up the findings of Keasey et al. (2015) and Quintiliani (2017), who claim that FDL has a significant direct relationship with the cost of FD. Furthermore, tangible fixed assets are expected to have a significant negative relationship with FD costs. This is consistent with the literature, which states that in times of financial distress, firms can gain easy access to the credit market by offering tangible fixed assets as collateral, easing their financial constraints. This supports the findings of Keasey et al. (2015) and (Quintiliani, 2017). Furthermore, the findings support the viewpoint of Bulot et al. (2017) that firms with a higher proportion of tangible assets have less incentive to push the firm into bankruptcy. Due to the small and underdeveloped bond market, Pakistani firms have no choice but to seek assistance from financial institutions in times of financial distress.

Similarly, long-term leverage has a significant inverse relationship with the costs of FD. A significant negative sign indicates that firms received relief from financial difficulties due to longterm debt, and in this case, the costs of FD were minimised. Furthermore, it demonstrates that during difficult times, firms are more likely to approach financial institutions. As a result, it becomes a preferred source of financing for businesses during times of distress. The findings support the findings of Pranowo et al. (2010), who discovered an inverse relationship between leverage and bankruptcy in Indonesia. Similarly, Kristanti et al. (2016) find a negative relationship between leverage and the cost of financial distress in Indonesian family businesses. The findings, on the other hand, do not support the findings of Waqas et al. (2018), Abdullah (2006) in Malaysia, and Chancharat et al. (2008) in Australia, which show a positive relationship between leverage and the possibility of a company going bankrupt. Similarly, the results do not support the findings of Younas et al. (2021), who discovered that leverage has a significant positive impact on the likelihood of financial distress in Pakistani firms. Short-term credit has no discernible relationship with the costs of FD.

Table 8 shows the effects of the ownership-modified model. As shown, the results for the variable discussed above are the same in terms of sign and significance; hence, these results are a strong robustness check for the previous model. Ownership concentration does not affect financial distress costs. This insignificant impact supports the findings of Manzaneque et al.

Table 7. Regression	ו results						
ExaFDC	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LFDL	6.841	2.24	3.04	0.002	11.252	2.431	***
TFA	387	.223	-1.78	.065	833	.04	*
LTLev	-2.749	.358	-7.40	0.001	-3.35	-1.947	***
STCred	464	.227	-1.61	.108	809	.08	
Constant	1.584	.111	9.81	0.002	.867	1.3	***
Number of Obs	19	21	F (4,1	1703)		2.53	
R-sq	0.1	78	Prob) > F		0.0389	
a * 10 > a ** n < 01 ** n < 05 * n	<1						

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Table 8. Regression	results (Moderating	j effect)					
ExaFDC	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LFDL	6.852	2.25	3.04	0.002	11.267	2.437	***
TFA	375	.223	-1.73	.086	822	.052	*
LTLev	-2.243	.459	-4.80	0.003	-3.103	-1.304	***
STCred	177	.312	-0.25	.814	688	.533	
Con_Own	.302	.297	0.68	867.	381	.785	
LTLev* Con_Own	58	.313	-1.76	680.	-1.164	.063	*
STCred* Con_Own	496	.27	-1.47	.162	926	.133	
Constant	.96	.223	4.23	0.001	.504	1.377	***
Number of Obs	197	21	F (7,1	[700]		1.47	
R-sq	0.1	95	Prob	0 > F		0.1735	
Note: *** p <.01, ** p <.02	5, * p <.1	-					

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Table 9. Regression	n results (Robustness	s test)					
ExaFDC	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
LFDL	8.5	2.436	3.49	0.00	13.278	3.723	***
TFA	-148.75	41.648	-3.12	.003	-211.378	-48.122	***
LTLev	-24.485	57.17	-0.43	.679	-136.485	87.616	
STCred	-88.961	64.49	-1.38	.268	-215.299	37.498	
CINV	.278	.757	0.36	.726	-1.208	1.758	
TQ	108.767	64.803	1.67	.095	-18.495	235.529	*
Intang	-1.268	.644	-1.80	.075	-2.421	.105	*
Size	-16.627	10.379	-1.60	.129	-36.959	3.725	
Constant	372.635	237.701	1.57	.127	-93.25	838.521	
Number of Obs	175	94		F (9,1585)		1.9	0
R-sq	0.2.	53		Prob > F		0.04	76
Note: *** p <.01, ** p <.0	15, * p <.1						

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(2016), who discovered that ownership concentration has an insignificant impact on financial distress in Spanish firms. With financial distress costs, the interactive variable of long-term debt and concentrated ownership is negative and significant. This demonstrates that in non-financial PSX-listed firms with less concentrated ownership, the positive relationship between long-term debt and expected financial distress costs is reduced. As a result, the coefficient of this effect is smaller for this type of firm, indicating that bank credit is more important in the permanent financing of the sample firms with more dispersed ownership: dispersed ownership is likely to enable more professionalised monitoring, reducing informational opacity and, as a result, financial distress costs. Secondly, the interaction variable of ownership concentration and short-term debt is proving insignificant with the cost of FD. This indicates that suppliers and short-term loan providers become reluctant to provide financing to less concentrated-owned firms at the time of need. Less full-owned firms are not better positioned to get rid of this adverse financial condition by taking short-term funds from suppliers and trade creditors.

4.1. Results of the robustness test

For Robustness, we include a change in investment (CINV), Tobin's Q (TQ), intangible assets (Intang), and firm size (Size) variables that have been shown in the literature to affect the indirect FD cost, which in turn increases the cost of FD (Bulot et al., 2017; M. Farooq et al., 2020; Tshitangano, 2010). Our results, presented in Table 9, remain qualitatively the same and are consistent with those of our main regression. Overall, the results of the additional control variables are consistent with previous research (Korteweg, 2007).

5. Conclusions

In this study, we examine the fundamentals of FD costs using non-financial firms listed on the PSX. Using the model of Keasey et al. (2015), we compute the ExaFDC, which is generally not directly observable. Expected FD costs are the product of FDL multiplied by the magnitude of FD costs borne by a firm in the event of bankruptcy. The study's final sample consists of 214 non-financial firms, and it spans the years 2010 to 2018. After employing the FEM, it was discovered that the FDL was significantly positively associated with the cost of FD. The greater the FDL, the greater the cost of FD. Long-term leverage and tangible fixed assets have a significant negative relationship with FD costs. The interactive variables of long-term leverage and concentrated ownership remain significant @ p < 0.10. The interaction variable of concentrated ownership shows that highly concentrated firms fail to secure short-term borrowing; hence the association between short-term borrowing and financial distress costs becomes insignificant in highly concentrated firms. Further, we argue that suppliers and trade creditors become reluctant to grant short-term loans to highly concentrated firms.

We conclude that to handle financial issues, Pakistani enterprises primarily rely on long-term financing; there is a need to build a bond market so that Pakistani firms can gain access to funding and be better prepared to deal with the current financial situation. The study's findings guide corporate executives, stakeholders, regulators, and financial institutions. The study's findings benefited managers in a variety of ways. Managers can lower financial distress costs by securing long-term money from financial institutions using tangible fixed assets, whereas the availability of short-term loans has little bearing on financial distress costs. Furthermore, the findings advise corporate executives to maintain an adequate level of leverage and liquidity to save the firms from the costs of financial distress. To reduce the costs of financial distress, firms should maintain a low level of ownership concentration. Furthermore, the findings may provide managers with early warning signals to save the company from financial distress. Similarly, existing and potential investors may benefit from the current research as well. Before making an investment decision in a particular firm, an investor can calculate the costs of financial distress. This will assist him in making more rational decisions. In terms of theoretical contribution, the current study adds to the existing literature by incorporating new evidence from developing countries such as Pakistan, which will aid regulatory authorities and policymakers in developing strategies to protect firms from financial distress. Finally, government agencies are required to provide tax breaks,

infrastructure improvements, and a favorable environment to reduce the cost of financial distress. Furthermore, the greater the ability to predict financial distress, the better financial institutions can allocate funds, especially during a crisis. These findings could be applied to other emerging markets where financial distress costs are substantial. Furthermore, these findings may aid policymakers in developing relevant policies to support businesses, particularly during times of crisis.

Despite these findings, this research has the following drawbacks. First, the total number of shares held by the top five shareholders is used to calculate ownership concentration. It can be subdivided further, as Yasser and Al Mamun (2015) did, from the single largest stakeholder to the percentage of the ten largest stockholders. Second, the study's sample consists of 214 firms from 2010 to 2018. As a result, more efforts should be made to cover longer periods to minimise the time effect on results. To see if the outcomes differ, future studies may categorise based on individual, family, and institutional characteristics. The non-financial sector was used in this study; in the future, it is advised that the results be compared to the financial distress and healthy firms and performing the same analysis will be an addition to the literature. Lastly, additional research in the future could test the reliability of the findings presented here by utilising a different set of econometric methods and financial distress measures than those that were utilised in this study.

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References

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- Abdullah, S. N. (2006). Board structure and ownership in Malaysia: The case of distressed listed companies. *Corporate Governance: The International Journal of Business in Society*, 6(5), 582–594. https://doi.org/10. 1108/14720700610706072
- AlHares, A. (2019). Corporate governance and cost of capital in OECD countries. International Journal of Ethics and Systems, 35(4), 665–690. https://doi.org/ 10.1108/IJOES-02-2019-0043

- 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. 2307/2978933
- Altman, E. I. (1984). A further empirical investigation of the bankruptcy cost question. *The Journal of Finance*, 39(4), 1067–1089. https://doi.org/10.1111/j.1540-6261.1984.tb03893.x
- Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., & Suvas, A. (2017). Financial distress prediction in an international context: A review and empirical analysis of Altman's Z-score model. *Journal of International Financial Management Accounting*, 28 (2), 131–171. https://doi.org/10.1111/jifm.12053
- Andrade, G., & Kaplan, S. N. (1998). How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. The Journal of Finance, 53(5), 1443–1493. https://doi.org/ 10.1111/0022-1082.00062
- Antoniou, A., Guney, Y., & Paudyal, K. (2006). The determinants of debt maturity structure: Evidence from France, Germany and the UK. *European Financial Management*, *12*(2), 161–194. https://doi.org/10. 1111/j.1354-7798.2006.00315.x
- Ashraf, S., Félix, E, G. S., & Serrasqueiro, Z. (2019). Do traditional financial distress prediction models predict the early warning signs of financial distress? *Journal of Risk Financial Management*, 12(2), 55. https://doi.org/10.3390/jrfm12020055
- Baltagi, B. H., Bratberg, E., & Holmås, T. H. (2005). A panel data study of physicians' labor supply: The case of Norway. *Health Economics*, 14(10), 1035–1045. https://doi.org/10.1002/hec.991
- Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking Finance*, 22(6–8), 613–673. https://doi.org/ 10.1016/S0378-4266(98)
- Blums, M. (2003). D-Score: Bankruptcy Prediction Model for Middle Market Public Firms. Available online at: http://www.minneapolisfed.org/mea/contest/ 2004papers/blums.pdf
- Bulot, N., Salamudin, N., & Abd Aziz, R. (2017). The size of indirect financial distress costs: Which variable is

reliably important? *Jurnal Intelek*, 12(1), 13–20. https://ir.uitm.edu.my/id/eprint/40729/

- Chancharat, N., Krishnamurti, C., & Tian, G. G. (2008). When the going gets tough: Board capital and survival of new economy IPO firms. Paper presented at the 21st Australasian Finance and Banking Conference 2008 Paper. http://dx.doi.org/10.2139/ssrn.1253171
- Chen, M. Y. (2011). Predicting corporate financial distress based on integration of decision tree classification and logistic regression. *Expert Systems with Applications*, 38(9), 11261–11272. https://doi.org/10. 1016/j.eswa.2011.02.173
- Claessens, S., Djankov, S., Fan, J. P., & Lang, L. H. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance*, 57(6), 2741–2771. https://doi.org/10.1111/1540-6261.00511
- Cunat, V. (2007). Trade credit: Suppliers as debt collectors and insurance providers. *The Review of Financial Studies*, 20(2), 491–527. https://doi.org/10.1093/rfs/ hhl015
- de Miguel, A., Pindado, J., & de la Torre, C. (2005). How do entrenchment and expropriation phenomena affect control mechanisms? *Corporate Governance: An International Review*, 13(4), 505–516. https://doi.org/ 10.1111/j.1467-8683.2005.00445.x
- Dibra, R. (2016). Corporate governance failure: The case of Enron and Parmalat. *European Scientific Journal*, 12(16). https://doi.org/10.19044/esj.2016. v12n16p283
- Donker, H., Santen, B., & Zahir, S. (2009). Ownership structure and the likelihood of financial distress in the Netherlands. *Applied Financial Economics*, 19(21), 1687–1696. https://doi.org/10.1080/ 09603100802599647
- Dou, W. W., Taylor, L. A., Wang, W., & Wang, W. (2021). Dissecting bankruptcy frictions. Journal of Financial Economics, 142(3), 975–1000. https://doi.org/10. 1016/j.jfineco.2021.06.014
- Farooq, U., & Jibran, A. Q. (2018). Scope, measurement, impact size and determinants of indirect cost of financial distress: A systematic literature review. *Qualitative Research in Financial Markets*, 10(1), 111–129. https://doi.org/10.1108/QRFM-08-2017-0080
- Farooq, M., Noor, A., & Fatima, K. (2020). The impact of corporate governance on financial distress likelihood: An empirical evidence. *City University Research Journal*, 10(4), 614–634. http://cusitjournals.com/ index.php/CURJ/article/view/417
- Farooq, U., Qamar, M. A. J., & Haque, A. (2018). A three-stage dynamic model of financial distress. *Managerial Finance*, 44(9), 1101–1116. https://doi. org/10.1108/MF-07-2017-0244
- García-Teruel, P. J., & Martínez-Solano, P. (2007). Shortterm debt in Spanish SMEs. International Small Business Journal, 25(6), 579–602. https://doi.org/10. 1177/0266242607082523
- Gordon, M. J. (1971). Towards a theory of financial distress. The Journal of Finance, 26(2), 347–356. https:// doi.org/10.2307/2326050
- Grice, J. S., & Ingram, R. W. (2001). Tests of the generalizability of Altman's bankruptcy prediction model. *Journal of Business Research*, 54(1), 53–61. https:// doi.org/10.1016/S0148-2963(00)
- Hamilton, R. T. (2012). How firms grow and the influence of size and age. International Small Business Journal, 30(6), 611–621. https://doi.org/10.1177/ 0266242610383446
- Hunjra, A. I., Naeem, H., Noor, A., & Saleem, A. (2016). Does Corporate Governance Play Role In Firms'

Performance? A Comparative Study of Pakistan, India and Bangladesh. International Journal of Economics and Empirical Research, 4(9), 450–464. https://papers. ssrn.com/sol3/papers.cfm?abstract_id=3229746

- Hunjra, A. I., Perveen, U., Li, L., Chani, M. I., & Mehmood, R. (2020). Impact of ownership concentration, institutional ownership and earnings management on stock market liquidity. *Corporate Ownership & Control*, 17 (2), 77–87. https://doi.org/10.22495/cocv17i2art7
- Ikpesu, F. (2019). Firm specific determinants of financial distress: Empirical evidence from Nigeria. Journal of Accounting and Taxation, 11(3), 49–56. https://doi. org/10.5897/JAT2019.0333
- 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
- Kazemian, S., Shauri, N. A. A., Sanusi, Z. M., Kamaluddin, A., & Shuhidan, S. M. (2017). Monitoring mechanisms and financial distress of public listed companies in Malaysia. *Journal of International Studies*, 10(1), 92– 109. https://doi.org/10.14254/2071-8330.2017/10-1/ 6
- Keasey, K., Pindado, J., & Rodrigues, L. (2015). The determinants of the costs of financial distress in SMEs. International Small Business Journal: Researching Entrepreneurship, 33(8), 862–881. https://doi.org/10. 1177/0266242614529317
- Khurshid, M. K., Sabir, H. M., Tahir, S. H., & Abrar, M. (2018). Impact of corporate governance on the likelihood of financial distress: Evidence from Non-Financial firms of Pakistan. Pacific Business Review International, 11 (4), 134–149. http://www.pbr.co.in/2018/oct13.aspx
- Konstantaras, K., & Siriopoulos, C. (2011). Estimating financial distress with a dynamic model: Evidence from family owned enterprises in a small open economy. Journal of Multinational Financial Management, 21(4), 239–255. https://doi.org/10. 1016/j.mulfin.2011.04.001
- Korteweg, A. G. (2007). The costs of financial distress across industries. The University of Chicago.
- Kristanti, F. T., Rahayu, S., & Huda, A. N. (2016). The determinant of financial distress on Indonesian family firm. *Procedia-Social and Behavioral Sciences*, 219, 440–447. https://doi.org/10.1016/j.sbspro.2016. 05.018
- La Porta, R., Lopez-de-silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal* of *Finance*, 54(2), 471–517. https://doi.org/10.1111/ 0022-1082.00115
- La Porta, R., Lopez de Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, 58(1–2), 3–27. https://doi.org/10.1016/S0304-405X(00)00065-9
- Lee, -H.-H., Zhou, J., & Wang, J. (2018). Trade credit financing under competition and its impact on firm performance in supply chains. *Manufacturing Service Operations Management*, 20(1), 36–52. https://doi. org/10.1287/msom.2017.0640
- Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2013). Corporate ownership structure and the choice between bank debt and public debt. *Journal of Financial Economics*, 109(2), 517–534. https://doi.org/10.1016/j.jfineco. 2013.03.006
- Lizares, R. M., & Bautista, C. C. (2021). Corporate financial distress: The case of publicly listed firms in an emerging market economy. *Journal of International Financial Management & Accounting*, 32(1), 5–20. https://doi.org/10.1111/jifm.12122
- Makeeva, E. Y., & Khugaeva, M. O. (2018). Evaluation of financial distress costs of innovative companies.

Russian. Management Journal, 16(1), 37–62. https:// cyberleninka.ru/article/n/evaluation-of-financial-dis tress-costs-of-innovative-companies

- Manzaneque, M., Priego, A. M., & Merino, E. (2016). Corporate governance effect on financial distress likelihood: Evidence from Spain. *Revista de Contabilidad*, 19(1), 111–121. https://doi.org/10.1016/ j.rcsar.2015.04.001
- Mariano, S. S. G., Izadi, J., & Pratt, M. (2021). Can we predict the likelihood of financial distress in companies from their corporate governance and borrowing? International Journal of Accounting & Information Management, 29(2), 305–323. https://doi.org/10. 1108/IJAIM-08-2020-0130
- Mehmood, R., Hunjra, A. I., & Chani, M. I. (2019). The impact of corporate diversification and financial structure on firm performance: Evidence from South Asian countries. Journal of Risk and Financial Management, 12(1), 49. https://doi.org/10.3390/ jrfm12010049
- Memon, Z. A., Chen, Y., Tauni, M. Z., & Ali, H. (2018). The impact of cash flow volatility on firm leverage and debt maturity structure: Evidence from China. *China Finance Review International*, 8(1), 69–91. https://doi. org/10.1108/CFRI-06-2017-0106
- Molina, C. A., & Preve, L. A. (2012). An empirical analysis of the effect of financial distress on trade credit. *Financial Management*, 41(1), 187–205. https://doi. org/10.1111/j.1755-053X.2012.01182.x

Mselmi, N., Lahiani, A., & Hamza, T. (2017). Financial distress prediction: The case of French small and medium-sized firms. *International Review of Financial Analysis*, 50, 67–80. https://doi.org/10.1016/j.irfa. 2017.02.004

- Muñoz-Izquierdo, N., Laitinen, E. K., Camacho-Miñano, M. D. M., & Pascual-Ezama, D. (2020). Does audit report information improve financial distress prediction over Altman's traditional Z-Score model? Journal of International Financial Management & Accounting, 31(1), 65–97. https://doi.org/10.1111/ jifm.12110
- Newman, A., Gunessee, S., & Hilton, B. (2012). Applicability of financial theories of capital structure to the Chinese cultural context: A study of privately owned SMEs. International Small Business Journal, 30 (1), 65–83. https://doi.org/10.1177/ 0266242610370977
- Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 109–131. https://doi.org/10.2307/2490395
- Ohman, P., & Yazdanfar, D. (2017). Short-and long-term debt determinants in Swedish SMEs. Review of Accounting Finance, 16(1), 106–124. https://doi.org/ 10.1108/RAF-08-2015-0118
- Opler, T. C., & Titman, S. (1994). Financial distress and corporate performance. *The Journal of Finance*, 49(3), 1015–1040. https://doi.org/10.1111/j.1540-6261. 1994.tb00086.x
- Pindado, J., Rodrigues, L., & De La Torre, C. (2006). How does financial distress affect small firms' financial structure? *Small Business Economics*, *26*(4), 377–391. https://doi.org/10.1007/s11187-005-4845-8
- Pindado, J., Rodrigues, L., & de la Torre, C. (2008). Estimating financial distress likelihood. Journal of Business Research, 61(9), 995–1003. https://doi.org/ 10.1016/j.jbusres.2007.10.006
- Pistor, K. (2019). The code of capital. Princeton: Princeton University Press. https://doi.org/10.1515/ 9780691189437
- Poletti-Hughes, J., & Ozkan, A. (2014). Ultimate controllers, ownership and the probability of insolvency in

financially distressed firms. *Managerial Decision Economics*, 35(1), 36–50. https://doi.org/10.1002/ mde.2605

- Pranowo, K., Achsani, N. A., Manurung, A. H., & Nuryartono, N. (2010). The dynamics of corporate financial distress in emerging market economy: Empirical evidence from the Indonesian Stock Exchange 2004-2008. European Journal of Social Sciences, 16(1), 138–149.
- Psillaki, M., & Daskalakis, N. (2009). Are the determinants of capital structure country or firm specific? *Small Business Economics*, 33(3), 319–333. https://doi.org/ 10.1007/s11187-008-9103-4
- Quintiliani, A. (2017). Financial distress cost of Italian small and medium enterprises. The Journal of Risk Finance, 18(5), 564–580. https://doi.org/10.1108/JRF-04-2017-0071
- Rashid, A., & Abbas, Q. (2011). Predicting bankruptcy in Pakistan. *Theoretical Applied Economics*, 18 (9), 103– 128.
- Ray, S. (2011). Assessing corporate financial distress in automobile industry of India: An application of Altman's model. *Research Journal of Finance and Accounting*, 2(3), 155–168.
- Samanta, N. (2019). Transplantation of Anglo-American corporate governance and its impact on financial market growth: A comparative analysis of nineteen developing countries 1995–2014. Corporate Governance: The International Journal of Business in Society, 19(5), 884–922. https://doi.org/10.1108/CG-07-2018-0250
- Shahwan, T. M. (2015). The effects of corporate governance on financial performance and financial distress: Evidence from Egypt. *Corporate Governance*, *15*(5), 641–662. https://doi.org/10.1108/CG-11-2014-0140
- Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94(3, Part 1), 461–488. https://doi.org/10.1086/261385
- Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model. The Journal of Business, 74(1), 101–124. https://doi.org/10.1086/ 209665
- Solarino, A. M., & Boyd, B. K. (2020). Are all forms of ownership prone to tunneling? A meta-analysis. *Corporate Governance: An International Review, 28* (6), 488–501. https://doi.org/10.1111/corg.12344
- Sun, Q., Tong, W. H., & Tong, J. (2002). How does government ownership affect firm performance? Evidence from China's privatization experience. *Journal of Business Finance Accounting*, 29(1-2), 1–27.
- Tayachi, T., Hunjra, A. I., Jones, K., Mehmood, R., & Al-Faryan, M. A. S. (2021). How does ownership structure affect the financing and dividend decisions of firm? Journal of Financial Reporting and Accounting. https://doi.org/10.1108/JFRA-09-2021-0291
- Toms, S. (2013). The life cycle of corporate governance. In M. Wright, D. Siegel, K. Keasey, & I. Filatotchev (Eds.), *The Oxford handbook of corporate governance*. Oxford: Oxford University Press. https://doi.org/10. 1093/oxfordhb/9780199642007.013.0016
- Tshitangano, F. (2010). Cost of financial distress model for JSE listed companies: A Case of South Africa (Doctoral dissertation, University of Pretoria).
- Udin, S., Khan, M. A., & Javid, A. Y. (2017). The effects of ownership structure on likelihood of financial distress: An empirical evidence. Corporate Governance: The International Journal of Business in Society, 17(4), 589–612. https://doi.org/10.1108/CG-03-2016-0067
- Volkov, A., Benoit, D. F., & Van den Poel, D. (2017). Incorporating sequential information in bankruptcy prediction with predictors based on Markov for

discrimination. Decision Support Systems, 98, 59-68. https://doi.org/10.1016/j.dss.2017.04.008

Waqas, H., Md-Rus, R. J. C. E. F., & Elgammal, M. M. (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

- Warner, J. B. (1977). Bankruptcy costs: Some evidence. The Journal of Finance, 32(2), 337–347. https://doi. org/10.2307/2326766
- Wilner, B. S. (2000). The exploitation of relationships in financial distress: The case of trade credit. *The Journal of Finance*, 55(1), 153–178. https://doi.org/10. 1111/0022-1082.00203
- Xiaoqi, S. (2013). Earnings management, Tunnelling behaviour and corporate governance: The case in China. In Durham University. UK. Available at Durham E-Theses Online. https://etheses.dur.ac.uk/9414

- Yasser, Q. R., & Al Mamun, A. (2015). Effects of ownership concentration on firm performance: Pakistani evidence. Journal of Asia Business Studies, 9(2), 162–176. https://doi.org/10.1108/JABS-07-2014-0047
- Yazdanfar, D., & Öhman, P. (2020). Financial distress determinants among SMEs: Empirical evidence from Sweden. Journal of Economic Studies, 47(3), 547–560. https://doi.org/10.1108/JES-01-2019-0030
- Younas, N., UdDin, S., Awan, T., & Khan, M. Y. (2021). Corporate governance and financial distress: Asian emerging market perspective. *Corporate Governance: The International Journal of Business in Society*, 21(4), 702–715. https://doi.org/10.1108/CG-04-2020-0119
- Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. Journal of Accounting Research, 59–82. https://doi.org/10.2307/2490859

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