The effects of ownership structure on likelihood of financial distress: an empirical evidence

Shahab Udin, Muhammad Arshad Khan and Attiya Yasmin Javid

Abstract

Purpose – *The purpose of this paper is to explore the role of corporate governance proxies by ownership structure on the likelihood of firms' financial distress for a sample of 146 Pakistani public-limited companies listed at the Karachi Stock Exchange over the period of 2003-2012.*

Design/methodology/approach – *The dynamic generalized method of moments (GMM) estimator and panel logistic regression (PLR) are used to determine the impact of corporate governance on the financial distress. The ownership structure is used as a determinant of corporate governance, while the Altman Z-score is utilized as an indicator of financial distress, as it measures financial distress inversely. The smaller the values of the Z-score, the higher will be the risk of financial distress.*

Findings – *The authors find insignificant impact of ownership structure on firms' likelihood of financial distress based on the dynamic GMM method. However, the PLR results indicate that foreign shareholdings have a significant negative association with firms' likelihood of financial distress, in the case of Pakistan. An evidence of a negative and insignificant relationship between institutional ownership and financial distress was observed, which indicates the passive role of institutional investors in Pakistan. The results also reveal a positive and significant relationship between insider's ownership and likelihood of financial distress. This finding is consistent with the entrenchment hypothesis which predicts that insiders are more aligned with their self-interest than outside shareholders' interest when their shareholding increases in the business. Furthermore, the results also reveal insignificant association between government shareholdings and the probability of financial distress. The reason could be the social welfare objective of the government entities rather than profit maximization.*

Practical implications – *The findings of this study provide more insight to corporate managers and investors about the association between the quality of corporate governance and the degree of financial distress, with respect to Pakistani firms. Furthermore, this study contributes to the existing literature by adding new evidence from developing countries like Pakistan which are helpful for regulatory bodies and policymakers in the formulation of long-term corporate governance strategies to manage the financial distress. It is well established that strengthening the quality of corporate governance practices enhances the efficiency of capital markets and reduces the probability of financial distress.*

Originality/value – *The study extends the body of existing literature on corporate governance and the likelihood of financial distress with reference to Pakistan. The results suggest that policymakers may pay special attention to the quality of corporate governance, specifically ownership structure, while predicting corporate financial distress.*

Keywords *Corporate governance, Ownership structure, Z-score, Financial distress*

Paper type *Research paper*

Shahab Udin is PhD Scholar at the Department of Management Sciences, COMSATS Institute of Information Technology, Islamabad, Pakistan. Muhammad Arshad Khan is Associate Professor at the Department of Management Sciences, COMSATS Institute of Information Technology, Islamabad, Pakistan. Attiya Yasmin Javid is based at the Department of Economics, Pakistan Institute of Development Economics, Islamabad, Pakistan.

1. Introduction

It is well established in the literature that the success of modern corporations depends on the implementation of good corporate governance practices. There is general consensus among the academician and policymakers that sound corporate governance systems help companies to improve their financial performance and attract investment from domestic and international investors. Modern corporation can accomplish their corporate objectives,

Received 30 March 2016
Revised 7 November 2016
Accepted 16 November 2016

protect shareholders rights and meet legal compliances through a good corporate governance structure. Further, good corporate governance enables countries to develop their capital markets and promote enabling environment for investors. Good corporate governance mobilizes the capital through the promotion of efficient use of resources within the company and the economy. It also helps in attracting low-cost capital investment by improving domestic and foreign investors' confidence. Efficient corporate governance ensures the accountability of the board of directors and management (Rehmans and Mangla, 2010). Particularly, better compliance with the corporate governance practices might improve the redistribution of rents between shareholders and managers and also increase a firm's financial performance. In contrast, weak corporate governance practices ultimately hinder investment opportunities, capital market developments and increase the probability of financial distress. To this end, introduction and implementation of good governance practices have become central for policymakers and practitioners around the globe. Therefore, worldwide efforts are needed to stabilize and strengthen the performance of global capital markets through reduction in agency costs and protection of shareholders' rights.

The term corporate governance gains attention after the publication of the Cadbury Committee report in the UK in the early 1990s (Subramanian and Reddy, 2012). Previous studies have shown that investors globally agreed to pay large premium for companies with good corporate governance practices. Among others, McKinsey (2002) find that institutional investors would prefer to invest in companies with a good corporate governance structure and willing to bear about 30 per cent costs to their investment in emerging markets. It is also observed that companies with good corporate governance had high earning per share, market-to-book ratios and market capitalization.

The empirical literature on corporate governance and firm financial performance is widely available in both developed and developing countries. However, limited literature is available that deals with the association between corporate governance and the likelihood of firms' financial distress. The nature of relationship between the corporate governance structure and the likelihood of financial distress has become the core issue in corporate governance studies nowadays, after the financial crisis of 2008 and financial scandals of reputed companies around the world (i.e. Enron, World COM, Lehman Brothers and American Investment Group).

Policymakers, regulatory institutions and investors have recently expressed some concerns on corporate failure and weaknesses in corporate governance structures (Elloumi and Gueyie, 2001). Previous studies (Daily and Dalton, 1994; Elloumi and Gueyie, 2001; Lee and Yeh, 2004; Wang and Deng, 2006; Swain, 2009; Al-Tamimi, 2012; Shahwan, 2015; Manzaneque *et al.*, 2016) reported that financially healthy firms have good corporate governance systems than financially distressed ones. Similarly, Cutting and Kouzmin (2000), Parker *et al.* (2002) and Muranda (2006) studied the impact of corporate governance practices on the survival of financially distressed firms and provided mixed findings regarding the impact of corporate governance on the likelihood of financial distress[1]. Bhagat *et al.* (2005) found that financially distressed firms behave differently from financially constraint firms.

Whitaker (1999) argued that financial distress could occur because current debt obligations of firms exceed their cash inflows. Though, financial distress is not limited to firms' inability to repay its debt obligations but the sequence of other events may occur before firms default. Economic distress forces firms to go through financial distress, deteriorate their performance and management (Wruck, 1990). Enormous studies have been carried out on the prediction of financial distress models. These studies do not incorporate the effect of corporate governance variables on financial distress models. Good governance effectively prevents corporations from being too exposed to financial distress and bankruptcy. Black *et al.* (2006), Nahar Abdullah (2006) and Hodgson *et al.*

(2011) argued that good corporate governance practices strengthen firm performance and protect them against the risk of financial distress. Reddy *et al.* (2010) noted that good corporate governance would improve financial performance and benefits of shareholders through more access to capital, reduction in cost of capital and free cash flow among shareholders. In contrast, poor-quality corporate governance can increase compliance costs for business, increase unnecessary complexity and uncertainty and reduce the ability of the government to achieve its goals (OECD, 2008).

Corporate governance in Pakistan has received special attention since the last decade. Specifically, after the 1990s, the financial crunch and major corporate failure such as Taj Company, Sarah Textiles, Mehran Bank, Crescent Bank and ENGRO Group of Companies have diverted the attention of policymakers and managers toward the upgradation of corporate governance practices in Pakistan. Pakistan has made a significant progress over the years to upgrade the corporate governance infrastructure and encourage domestic and international investors. It can be argued that investment climate is affected by several factors such as macroeconomic environment of a country, physical infrastructure; legal and regulatory framework that defines the rights and responsibilities of stakeholders, levels of corporate governance, etc. Among others, corporate governance plays a crucial role in attracting local and foreign investments. Corporate governance in emerging markets like Pakistan is a burning issue and mounting its importance due to the emergent requirements of corporations for both internal and external financing. Both individual and institutional investors need positive returns on their investments.

The Government of Pakistan has taken several measures to modernize the corporate governance infrastructure. These include introduction of new legislation to strengthen the capital market liberalization process, development of corporate governance codes and establishment of Securities and Exchange Commission of Pakistan (SECP). The objective for the establishment of SECP is to reform and regulate the stock exchanges and to strengthen the corporate governance process in the country. The main responsibility of SECP is to articulate legal framework, upgrade rules and regulation and strength supervision of the capital market. In March 2002, SECP issued the code of corporate governance for listed companies to establish a system whereby a company is directed and controlled by its director in compliance with the best practices so as to safeguard the interests of diversified shareholders (Ahmed Sheikh and Wang, 2012). The code of corporate governance is based on recognized international principles, including openness, transparency and accountability in the affairs of listed companies. Despite these liberalization measures, in Pakistan, the equity market is still concentrated on ownership structure through cross-shareholding and pyramid ownership structure, family-owned business groups, debt (bank loans) as a preferable mode of financing rather than equity, an underdeveloped equity market and inactive market for corporate control (Tariq and Abbas, 2013; Claessens *et al.*, 2000). Furthermore, major corporations in Pakistan used cross-shareholdings and interlocking directorships to control businesses. In addition, weak disclosure practices and poor auditing standards deteriorated the quality of corporate governance in Pakistani-listed companies. Therefore, the quality of corporate governance seems to be relatively low. Hence, it is pertinent to analyze the impact of corporate governance on the likelihood of financial distress in the context of Pakistan.

Against this backdrop, the main objective of this study is to examine the impact of corporate governance on the likelihood of financial distress with respect to Pakistani firms listed at the Karachi Stock Exchange (KSE) for the period 2003-2012. The ownership structure, such as institutional ownership, insider's ownership, foreign ownership and government ownership, is used as a measure of corporate governance, while financial distress is obtained using the Altman *Z*-score model[2], as it measures financial distress inversely (Shahwan, 2015)[3].

The rest of the paper is organized as follows: Section 2 deals with literature review and development of hypothesis. Section 3 discusses the research design, while Section 4 describes data analysis and discussion of empirical results. Section 5 provides conclusion with some policy implications.

2. Literature review and development of hypothesis

The relationship between corporate governance (i.e. ownership structure) and the likelihood of corporate financial distress is a matter of interest to all stakeholders participating in the capital market. Ownership structure is the most cited determinant of corporate governance (Morck *et al.*, 1988; Himmelberg *et al.*, 1999; La Porta *et al.*, 2000; Thomsen and Pedersen, 2000; Ramaswamy *et al.*, 2002; Dwivedi and Jain, 2005). These studies suggest that a firm's ownership structure plays an animated role in the success or failure of a company. Corporate governance has been considered as a key factor in recent global financial crisis of 2008 and Asian financial crisis of 1997. Prowse (1998) and Rajan and Zingales (1997) concluded that ownership structure, ownership concentration and poor-quality corporate governance practices were the most important factors that led to Asian financial crisis. Many researchers Wang and Deng (2006), Swain (2009), Al-Tamimi (2012), Shahwan (2015), and Manzaneque *et al.* (2016) noted that good corporate governance improves firm financial performance and reduces the likelihood of financial distress. He *et al.* (2016) argued that state ownership and foreign ownership played a vital role to improve firm financial performance, in case of Chinese multinational corporations (MNCs). Narayanaswamy *et al.* (2012) analyzed corporate governance and financial distress for 500 Indian firms registered on the Bombay Stock Exchange (BSE) for the period 2008-2010. Based on the logistic regression model, the study corroborated the results that corporate governance and financial distress are positively associated with each other. Alali *et al.* (2012) investigated the affiliation between a firm's governance and firm's financial status of 8,545 US-based firms registered on the New York Stock Exchange for the period 2003-2005. The results from the logistic regression model revealed positive and significant association between credit score and firms' governance. The study further postulated that perfection in firms' governance and bond ratings goes side-by-side.

The agency and property rights theories predicted that a dispersed ownership structure can improve the quality of corporate governance and can reduce the likelihood of corporate failure. A large body of literature is available on this issue that can be divided into four main groups.

The first group of studies Duggal and Millar (1999), Woidtke (2002), Elyasiani and Jia (2010), Cornett *et al.* (2007), Li and Peng (2008), and Charfeddine and Elmarzougui (2010) analyzed institutional ownership and concluded that institutional ownership correlated with firm financial performance. For instance, institutional investors are considered the monolithic group of today's financial markets. Their increasing importance in corporate governance is observed from the growing volume and active role in capital market. As compared to insider's shareholdings, institutional shareholders are emerging pressure group on the managers to act in the best interest of shareholders. All the institutional investors have increased their ownership in corporations, and their motivation is to monitor corporate managers and regulators to protect the rights of shareholders. To this end, previous studies Heard and Sherman (1987), McConnell and Servaes (1990), Pound (1988), Clay (2001), Yuan *et al.* (2008), Donker *et al.* (2009), Uwuigbe and Olusanmi (2012), and Alfaraih *et al.* (2012) analyzed the effect of institutional ownership on firm financial performance and reported mixed evidence. For example, Pound (1988) argued that institutional investors have better knowledge and can monitor management activities at lower cost than individual small shareholders. Similarly, McConnell and Servaes (1990), Uwuigbe and Olusanmi (2012) and Alfaraih *et al.* (2012) have reported a positive and significant relationship between institutional ownership and a firm's financial performance.

Donker *et al.* (2009) argued that institutional investors focused long-term performance rather than short-term as management. Therefore, institutional investors play an active role in monitoring management activities, which improves firm financial performance and reduces the likelihood of default. On the other hand, Daily and Dalton (1994), Kim and Yi (2006) and Mangena and Chamisa (2008) found a negative relationship between institutional ownership and likelihood of financial distress.

The second group of studies (inter alia, Francis and Smith, 1995; Holthausen *et al.*, 1995;Palia and Lichtenberg, 1999) examined the impact of insiders ownership on the firm financial performance and likelihood of financial distress. These studies concluded that insider ownership has a significant influence on firm financial performance and likelihood of financial distress. Jensen and Meckling (1976) hypothesized that managers have tendency of allocating firm resources for their personal best interest; this self-tendency behavior may create conflicts with outside shareholders. In this regard, various studies, inter alia, Mueller *et al.* (2003), Cheung and Wei (2006) and Shyu (2013) have explored a positive relationship between managerial ownership and a firm's financial performance.

The convergence theory suggests that the participation of board members and executives in company ownership is a powerful incentive to align their interest with the shareholders and company objectives. Jensen (1993) argued that conflicts among shareholders, board of directors and executives arises because board members and managers typically do not have significant ownership in the company. Board members and managers have ownership in a company and take sage decisions to reduce the likelihood of financial distress. A large number of studies, inter alia, Wang and Deng (2006), Li and McNally (2007), Fich and Slezak (2008), Elloumi and Gueyie (2001), Donker *et al.* (2009), Zeitun (2009) and Al-Tamimi (2012) showed a negative relationship between insider's ownership (directors/managers) and likelihood of financial distress.

The third group of studies, Aydin *et al.* (2007), Heard and Sherman (1987), Khanna and Palepu (1999), Shleifer and Vishny (1986), Dahlquist and Robertsson (2001), Oxelheim and Randøy (2003), Kim and Yi (2004) and Ongore (2011)) is related to the foreign ownership and its impact on the firm performance and the likelihood of financial failure. These studies considered foreign investment as a benchmark of stock market development and of investor's confidence on the capital markets. For instance, Aydin *et al.* (2007) reported that firms with foreign ownership have better financial performance than the domestically owned companies. Heard and Sherman (1987), Khanna and Palepu (1999) and Shleifer and Vishny (1986) argued that insider's owners have incentives to pursue their self-interest at the cost of minority shareholders and catered agency problem. Dahlquist and Robertsson (2001) argued that, in emerging markets, the domestic institutional shareholders are inefficient to play an active monitoring role due to underdeveloped capital markets, lack of adequate regulatory system and political constraints. Oxelheim and Randøy (2003) reported that foreign shareholders as board member have a positive effect on firm performance. Kim and Yi (2004) observed that foreign ownership can assist in reducing agency problems and improves firm financial performance. Ongore (2011) studied the effect of different types of ownership on firm financial performance in Kenya and reported a positive and significant impact of foreign shareholdings on the firm financial performance. Some researchers argued that foreign investors helped to improve management process system and access to resources. Foreign shareholders are more profit-oriented and having more incentives to monitor the company's management. For example, Rohani *et al.* (2013) found a negative relationship between foreign ownership and the likelihood of financial distress. Yoo and Koh (2014) find that foreign ownership decreases tax avoidance in Korean context as compared to family-owned businesses. The results of this study highlighted that foreign equity holding has a significant and positive effect on firm performance. They concluded that the monitoring function of foreign investors

enhances firm performance and complements the relatively weak monitoring by domestic institutions.

The fourth group of studies, such as De Alessi (1980), Vickers and Yarrow (1997), Shapiro and Willig (1990), Shleifer and Vishny (1986), Wang and Deng (2006), Li and McNally (2007), Zeitum (2009), Donker *et al.* (2009), Alfaraih *et al.* (2012) and Md-Rus *et al.* (2013), analyzed the government ownership and the likelihood of financial distress and reported mixed evidence. For example, Alfaraih *et al.* (2012) reported a significant positive relationship between government shareholdings and a firm's financial performance. Deng and Wang (2006) examined the relationship between financial distress risk and characteristics of ownership structure and concluded that state ownership has a significant negative impact on the likelihood of a firm's financial distress. Similarly, De Alessi (1980), Vickers and Yarrow (1997), Shapiro and Willig (1990), Shleifer and Vishny (1986) argued that state-owned businesses are much influenced by political government with huge public shareholdings. However, these public shareholders do not have the right to claim residual income directly. These individual public shareholders conceded their ownership rights to the management (i.e. bureaucracy), which has no clear vision to improve firm performance.

Government shareholdings companies are established for public functions and government priorities for social benefits rather than profit maximization. Moreover, the managers of government shareholdings companies are appointed in a bureaucratic way and on political grounds, which will combat against distress to protect their position and political prospects. In case of default, the government will provide support by injecting capital and relaxing taxes even until they default. Thus, government shareholding affects the firm financial performance negatively and is expected to reduce the likelihood of firms' financial distress.

Sarkar and Sarkar (2008) analyzed the role of debt in corporate governance in India where debt has been considered as an important source of external finance. The results indicated that, in the early years of institutional change, debt did not have any disciplinary effect on either standalone or group of affiliated firms. However, the study confirmed that, in the later years, the disciplinary effect of debt appeared as institution and became more market-oriented. Furthermore, they find limited evidence of debt being used as expropriation in group firms that are more vulnerable to such expropriation. The finding of this study highlighted the role of ownership structure and institutions in debt governance. More recently, Shahwan (2015) examined the quality of corporate governance practices and their impact on firm financial performance and financial distress in the case of Egyptian-listed companies. The results suggest that the quality of governance practices is relative low. The results do not support the positive association between corporate governance practices and financial performance. The study also obtained an insignificant negative relationship between corporate governance practices and the likelihood of financial distress. However, the study confirmed that firm-specific characteristics are useful determinants of firm performance and the likelihood of financial distress.

On the basis of above cited literature, we can develop the following testable alternative hypotheses:

H1a. Institutional ownership and the likelihood of financial distress are negatively correlated.

H2a. Negative relationship between insider's ownership and the likelihood of financial distress.

H3a. Foreign ownership and the likelihood of financial distress are inversely associated.

H4a. Negative association between government ownership and the likelihood of financial distress.

3. Research design and methodology

3.1 Data and sample

The present study is based on the sample of 146 manufacturing companies registered at the KSE over the period 2003-2012. The present study considers the manufacturing sector for two reasons. First, the manufacturing sector plays a crucial role in the economic development of Pakistan. Moreover, the manufacturing sector is the third largest sector contributing 13.5 per cent to the gross domestic product (GDP) and 14 per cent of the total employment. Second, there are significant differences between the financial reporting, accounting standards, regulations and corporate governance requirements of manufacturing and non-manufacturing firms (i.e. financial sector firms). Such differences may affect the accuracy of accounting measures (Shahwan, 2015). Therefore, combined analysis of financial and non-financial firms may not provide accurate information. Financial firms are also highly leveraged and have a unique financial structure, which can affect financial decisions differently (Lim *et al.*, 2007). Moreover, financial firms are heavily regulated state-owned enterprises and restructuring of financial sector in Pakistan is initiated since 1990, which resulted inconsistency and wobbly financial sector data.

Initially, we have selected a sample of 200 manufacturing firms out of a total of 387 manufacturing firms listed on the KSE, which altogether accounts for 51.67 per cent of the entire population (see Table AI). The sample includes large as well as small firms on the basis of market capitalization. The final sample selection is based on the data availability criteria for at least 10 consecutive years period. We deleted all those firms for which the data on corporate governance variables or financial variables were not available or missing values during the sample period. The final sample consists of 146 manufacturing firms with 1,460 firm-year observations which are 37.72 per cent of the total listed manufacturing firms at the end of 2012. This sample size is comparable to the earlier studies such as Akbar *et al.* (2016), Manzaneque *et al.* (2016), Shahwan (2015), Wahba (2015), Kamel and Shahwan (2014), Tariq and Abbas (2013), Saifullah (2012), Javid and Iqbal (2010), and Javed and Iqbal (2007) and Shaheen and Nishat (2005). Data on all the variables are collected from the State Bank of Pakistan's various publications and annual reports of the selected companies. Data pertaining on the firm-specific financial variables are gathered from balance sheet analysis of the joint -stock companies published by the State Bank of Pakistan (SBP, 2007/2012). Data related to ownership structure are obtained from the annual reports of the sampled companies. Table I reports the sector-wise distribution of the sampled companies.

It is evident from Table I that the share of textile sector in the total sample is 27.40 per cent, followed by engineering sector (19.18 per cent), chemical sector (16.44 per cent), fuel and energy sector (10.96 per cent), sugar sector (10.27 per cent), food sector (7.53 per cent), cement sector (6.86 per cent) and tobacco sector (1.37 per cent).

Table I Sector-wise distribution of sampled companies

Sector	*No. of firms*	*% of sample*
Textile sector	40	27.40
Engineering sector	28	19.18
Chemical sector	24	16.44
Fuel and energy sector	16	10.96
Sugar sector	15	10.27
Food sector	11	7.53
Cement sector	10	6.85
Tobacco Sector	2	1.37
Total	146	100

To examine the variation among the industrial sectors, we use the Kruskal-Wallis test following Shahwan (2015)[4]. The results are reported in Table II.

As can be seen from Table II that, out of 13 variables, nine variables, including insider ownership, institutional ownership, government ownership, Altman *Z*-score, return on asset, Tobin's Q, market-to-book ratio and leverage are found to be statistically significant as indicated by the χ^2 statistics. However, industrial sectors have insignificant variations with respect to foreign ownership, firm's size, sales growth, return on equity and profit margin.

3.2 Measuring financial distress

Financial distress is measured through the Altman *Z*-score. The Altman *Z*-score provides a threshold level to predict firm financial health and distance to financial distress. Typically, companies that score above 2.99 are less likely to be bankrupt and are considered to be in a "safe zone" and predict that the firm has no chance of distress in near future. The value of *Z*-score lies between 1.81 and 2.99 (i.e. $1.8 < Z < 2.99$) is categorized as a "grey zone" which indicates that the firm has no financial problem at the present, but may face difficulty in near future. Conversely, a score below 1.8 ($1.8 < Z$) indicates that companies are likely heading for bankruptcy and are treated as "distress zone" (Altman, 1968, p. 594). On the basis of *Z*-scores, we classified the selected companies into two groups: financially healthy and financially distressed. Firms that score above 1.81 are in a "grey zone" and treated as financially healthy firms. Conversely, companies that score below 1.81 are in a "distress zone" and treated as financially distressed firms.

3.3 Measuring ownership structure

Henry (2010) pointed out that ownership structure is considered as an external mitigating attribute in the overall corporate governance of a firm. The relationship between ownership structure and firm performance can be influenced by the separation of ownership from control and by agency costs (Berle and Gardiner, 1932; Jensen and Meckling, 1976). Due to inappropriate incentives and insufficient monitoring, managers exercise their discretions to pursue strategies that benefit themselves at the expense of shareholders. Consequently, agency conflicts arise. Therefore, there exists a negative relationship between conflicts and firm performance which, in turn, increases the probability of financial distress. The present study uses four proxies to measure the ownership structure: institutional ownership (*INSO*), insider ownership (*IO*), foreign ownership (*FO*) and government ownership (*GO*).

Table II Results of the Kruskal-Wallis rank test

Serial no.	*Variables*	*χ^2statistic*
Ownership structure variables		
1	Institutional ownership	86.4***
2	Insider ownership	170.3**
3	Foreign ownership	45.8
4	Government ownership	41.6***
Financial distress proxy		
5	Altman *Z*-score	66.11***
Firm specific variables		
6	Return on asset	108.10**
7	Return on equity	59.40
8	Tobin's Q	201.14***
9	Market-to-book ratio	130.06
10	Firm's size	159.42
11	Sales growth	15.83**
12	Leverage	127.75
13	Profit margin	136.09

Notes: ***; ** and; *indicates significance at the 1, 5 and 10% level

3.4 Control variables

As indicated by Strandskov (2006), firm-specific advantages comprise the explanatory variables having a strong effect on business performance. This study uses five control variables to account for the joint impact of corporate governance on the likelihood of financial distress and to avoid spurious correlation among the variables and specification errors in the estimated model (McConnell and Servaes, 1990). Following Ting and Lean (2015), we incorporated firm size, net profit margin, payout ratio, leverage and sales growth as control variables. Table III reports the definition of variables along with data sources.

3.5 Model specification

To examine the impact of corporate governance on the financial distress and likelihood of firm's financial distress, we specify the following econometric models:

$$FD_{it} = \alpha_0 + \theta FD_{it-1} + \alpha_1 OWNS_{it} + \alpha_2 Siz_{it} + \alpha_3 PM_{it} + \alpha_4 \Pr atio_{it} \\ \alpha_5 Lev_{it} + \alpha_6 SG_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

$$Y_{it} = \alpha_0 + \gamma_1 OWNS_{it} + \gamma_2 Siz_{it} + \gamma_3 PM_{it} + \gamma_4 \Pr atio_{it} + \gamma_5 Lev_{it} + \gamma_6 SG_{it} + \varepsilon_{it}$$

$$\varepsilon_{it} = \mu_i + e_{it} \; i = 1, \ldots\ldots\ldots, N; \qquad t = 1, \ldots\ldots\ldots\ldots, T \quad (2)$$

Where i and t denote the cross-sectional units and time period, respectively. The variable *Z-score* is used as a proxy of financial distress (FD_{it}). In equation (1), one lag of FD_{it} is included in the specification to control the endogeneity problem. Similarly, Y_{it} is a dummy variable that indicates the likelihood of financial distress. To calculate Y_{it}, we classified selected companies into two groups: financially healthy and financially distressed on the basis of the Altman *Z*-score. If the value of *Z*-scores lies above 1.81, firms are treated as financially sound. However, if the value of *Z*-score lies below 1.81, firms are treated as financially distressed. On the basis of this information, we calculated a dummy variable (Y_{it}) that takes the value one if firms are financially distressed and zero otherwise. Following Shahwan (2015), we use ownership structure ($OWNS_{it}$) as a proxy of corporate governance. The variable $OWNS_{it}$ includes institutional ownership ($INSO_{it}$), insider's ownership (IO_{it}), foreign ownership (FO_{it}) and government ownership (GO_{it}). The control variables are firm size (Siz_{it}), profit margin (PM_{it}), payout ratio ($\Pr atio_{it}$) and sales growth (SG_{it}). The ε_{it} is composite error term, μ_i measures the firm-specific effect, while e_{it} is the error term. The term η_i is unobserved time-variant firm effect. In addition, year dummies are also included in the specification as control variables.

Table III Definition of variables and data sources

Variables	*Symbol*	*Source*
Independent variables: corporate governance (i.e. ownership structure)		
Insider ownership	IO_{it}	Annual reports of the companies
Institutional ownership	$INSO_{it}$	Annual reports of the companies
Foreign ownership	FO_{it}	Annual reports of the companies
Government ownership	GO_{it}	Annual reports of the companies
Dependent variables: financial distress (FD_{it})		
Z-score	Y_{it}	Self constructed
Control variables		
Net profit margin	PM_{it}	Balance sheet analysis
Firm size	Siz_{it}	Balance sheet analysis
Payout ratio	$\Pr atio_{it}$	Calculated by authors
Leverage	Lev_{it}	Balance sheet analysis
Sales growth	SG_{it}	Calculated by authors

Note: 5. Also see Table IIIA in Appendix

3.6 Methodology

We applied the dynamic generalized method of moments (GMM) estimator and panel logistic regression (PLR) model to examine the impact of ownership structure on the likelihood of firm financial distress. Dynamic GMM is used to control for endogeneity that may arises from firm-specific unobservable heterogeneity and simultaneity[6]. To overcome this problem, Arellano and Bond (1991) and Blundell and Bond (1998) proposed the dynamic GMM estimator as the most suitable estimator to cope with the endogeneity and simultaneity (Antoniou *et al.*, 2008; Nakano and Nguyen, 2012, Wintoki *et al.*, 2010; Nguyen *et al.*, 2014). In dynamic GMM, the one-year lag of dependent variable is included in the model as independent variable to capture the dynamics of adjustment and to control for endogeneity problem. It is worth mentioning here that, in dynamic GMM, we used the *Z*-score index as a proxy of financial distress. To check the robustness of results, we use the PLR model to determine the impact of corporate governance on the likelihood of financial distress following Shahwan (2015). In the PLR model, we used the probability of financial distress as dependent variable (Y_{it})[7]. The main advantage of the PLR model is that it overcomes the limitations of the ordinary least squares (OLS) parameters when the dependent variable appears as a dummy variable. Many earlier studies, inter alia, Wang and Deng (2006), Elloumi and Gueyie (2001), Donker *et al.* (2009), Zeitun (2009), Al-Tamimi (2012), Md-Rus *et al.* (2013), Shahwan (2015) and Manzaneque *et al.* (2016) used the PLR model to examine the impact of corporate governance practices on the likelihood of firm financial distress.

4. Empirical analysis

Our empirical analysis consists of two sections. Sub-section 4.1 presents the analysis of descriptive statistics, while the regression results are discussed in sub-section 4.2.

4.1 Descriptive statistics

The descriptive statistics analysis presented in Tables IV and V provides information about the sample characteristics such as mean value, median, maximum value and minimum

Table IV Descriptive statistics of financial variables

Variables	*Mean*	*Median*	*Maximum*	*Minimum*	*SD*	*Skewness*	*Kurtosis*	*Obs*
Debt	5,028	1,530.98	96,144.9	10.26	9,502.1	4.24	26.8	1,460
Dividend	232	10.4	8,279.11	0.00	720.44	5.6	41.53	1,460
Equity	3,942	1,057.15	98,225.7	−3672.9	8,996.8	5.81	47.71	1,460
Sales	13,955	2,926.85	820,530.4	13.37	46,571.8	10.41	146.2	1,460
Total assets	8,971	2,994.61	127,004.5	23.18	16,049.6	3.59	18.46	1,460
Market capitalization	10,788	912.1	828,401.8	0.00	49,010.21	10.61	138.16	1,460
Net profit	1,040	107.48	65,425.66	−16004.7	4,963.19	8.44	92.36	1,460

Note: SD and Obs denote standard deviation and observations, respectively

Table V Descriptive statistics of ownership structure, financial distress and control variables

Variables	*Mean*	*Median*	*Maximum*	*Minimum*	*SD*	*Skewness*	*Kurtosis*	*Obs*
FO_{it}	0.039	0.00	0.847	0.00	0.111	4.566	25.927	1,460
GO_{it}	0.031	0.00	0.95	0.00	0.144	5.159	29.247	1,460
$INSO_{it}$	0.128	0.107	0.632	0.00	0.105	1.085	4.215	1,460
IO_{it}	0.262	0.182	0.983	0.006	0.215	1.309	4.05	1,460
FD_{it}	2.75	2.02	74.64	−8.88	4.28	9.15	125.21	1,460
Lev_{it}	0.603	0.615	2.31	0.002	0.249	1.118	9.005	1,460
$Size_{it}$	6.985	6.826	13.62	1.737	2.117	0.289	2.63	1,460
SG_{it}	0.178	0.164	2.739	−0.84	0.326	1.422	11.478	1,460
Pr $atio_{it}$	0.191	0.102	1.718	0.00	0.237	1.322	4.767	1,460
PM_{it}	0.078	0.04	0.913	0.00	0.117	3.226	16.484	1,460

value and standard deviation. Descriptive statistics also explain in terms of kurtosis and skewness statistics. Table IV presents the summary statistics of the total borrowing, total assets, equity, dividend payments, sales, market capitalization and total profit of the sampled companies. We include both large and small firms on the basis of their market capitalization. It can be seen that the mean value of sales growth is PKR13,954.99m with median of PKR2,926.85m. The mean value varies between PKR13.37m and PKR820,530.4m. The average market capitalization is PKR10,788m. The large companies have maximum market capitalization which is PKR828,401.80; while the minimum value of market capitalization is PKR0.000m. The maximum and minimum value of market capitalization provides an evidence of small and financially distressed companies. The standard deviation is PKR49,010.21. This high value of standard deviation could be perhaps due to the inclusion of large size companies in the sample which indicates that data are not consistent.

Similarly, the average value of the total assets is PKR8,971.00m, while standard deviation is PKR16,049.60m. The high value of standard deviation than its mean value shows large variation in total assets. This could be due to the presence of large companies in the sample. The average dividend paid by the sampled firms is PKR232m and varies from PKR0.00m to PKR8,279.11m. The minimum value of PKR0.00m shows that the selected sample contains companies that are not paying dividend to shareholders. The average value of debt, shareholders equity and net profit is respectively PKR5,028m, PKR232m and PKR1,040m.

Table V presents the general picture of the ownership structure, financial distress and other control variables of the sample.

As shown in Table V that the average value of foreign ownership (FO_{it}) is 3.9 per cent, with the median value is 0.00 per cent, showing that foreign shareholding is relatively low in manufacturing companies over the period 2003-2012[8]. The low trend of foreign shareholdings could be due to weak investor's protection, low-quality corporate governance, and social and political problems in the country. The mean value of foreign ownership is less than Indian foreign equity ownership. For example, Kumar (2004) reported 16.64 per cent foreign ownership in Indian-listed companies. The maximum value of foreign share is 84 per cent, which indicates that foreign entities have concentrated ownership like domestic companies. The foreign-listed companies at the KSE have same ownership structure like domestic-listed companies, and their share are not dispersed among the investors and other stakeholders. High variation in the ownership structure is a common factor due inconsistent and snip distribution of shares.

The average value of equity ownership of government (GO_{it}) is significantly low and equal to 3.1 per cent, which is less than foreign ownership (i.e. 3.9 per cent). The maximum and minimum value of government shareholding in public corporation is 95 per cent and 0.0 per cent, respectively. The maximum value of 95 per cent indicates that like foreign and family-owned enterprises, government-owned companies have also concentered ownership structures, and major shares are held by the government and government officials. One reason behind this closed shareholdings may be that most company's decisions require 50 per cent majority in shareholders meetings, but the strategic decisions require a supermajority vote of 75 per cent shareholdings. Thus, the rights of minority investors are controlled when ownership exceeds 75 per cent. However, our sample description indicates that both foreign and government companies have maximum ownership of more than 75 per cent, and thus reduce the possibility of contribution of minority shareholders in a firm's extraordinary decisions. The standard deviation is 14 per cent which is greater than average value, indicating high variation in the data of government ownership.

The mean and median values of institutional ownership ($INSO_{it}$) are 12.8 per cent and 10.7 per cent, respectively. Institutional ownership includes percentage of shares held by the financial institutions, banks, National Investment Trust (NIT)[9] and Investment Corporation of Pakistan. In our sample, the average and median values of institutional ownership (i.e. financial institutions) represent legal minority shareholders[10]. As indicated by Javid and Iqbal (2008), in Pakistan, the role of institutional ownership in corporate performance is passive and different form developing countries. However, the average value of institutional ownership is 12.8 per cent which is smaller than Japanese public-listed companies. For instance, Chen *et al.* (2003) reported 43.3 per cent, while 30 per cent by Lichtenberg and Pushner (1994) in case of Japanese-listed firms. We obtained the maximum and minimum value of institutional ownership is 63.2 per cent and 0.00 per cent, respectively. The maximum value of institutional ownership is 63.2 per cent, indicating that all institutions can effectively monitor the mismanagement and subjugation of the legal rights of minority shareholders. Standard deviation of institutional shareholdings is 10.5 per cent, which is less than the average value of institutional shareholdings, showing low variation in the data.

Similarly, the average and median values of insider's ownership (directors and executives shareholdings) are 26.2 per cent and 18.2 per cent, respectively. The mean and median values (26.2 and 18.2) of insider's equity holdings are much higher than foreign shareholdings, government shareholdings and institutional shareholdings. This evidence strengthens the view that majority of listed companies are family-owned business in Pakistan and the major shares are held by the family members of large business groups. This finding is in line with those of Cheema (2003). The mean and median of insider ownership is 26.2 per cent and 18.2 per cent, respectively, which is larger than that of Indian insider's shareholdings. For example, Kumar (2004) reported 17.29 per cent insider's ownership, while Sarkar and Sarkar (2000) reported 15.4 per cent with reference to India. The maximum and minimum value of insider ownership is 98.0 per cent and 0.06 per cent, respectively. The maximum value of insider's shareholdings strengthens the view that major listed companies in Pakistan are family-owned business and major proportions of shares are held by the family members. The standard deviation of insider ownership is 21.5 per cent and lies within the mean value supporting low variation in data series of insider's ownership.

The mean value of leverage is 60 per cent with the standard deviation of 24 per cent. The mean and median values of firm size are 6.986 and 6.82, respectively. The average sales growth of the selected companies is 17.8 per cent during the period 2003-2012. The mean values of payout ratio and profit margin are 19 per cent and 7.8 per cent, respectively. The average value of profit margin is very small, showing low profitability of selected companies, while some firms have high profit margin and earn up to 91 per cent profit. Similarly, the mean and value of financial distress (FD_{it}) is 2.75 and varies between – 8.88 to 74.64. The average value of FD_{it} is greater than 2.75, indicating that most companies lie in the safe zone and are considered as financially healthy firms. The maximum value of FD_{it} is 74.64, implying that selected companies are in the safe zone and away from financial distress, while the minimum value of FD_{it} is – 8.88, suggesting that the selected sample consists of some financially distressed firms.

To check the possibility of multicollinearity among the variables under consideration, we use the Pearson correlation test, and the results are reported in Table AIII (see Appendix). It can be seen from the correlation matrix that there exist weak correlation among the variables. Thus, we can deduce that there is no problem of multicollinearity.

4.2 Dynamic GMM results

Table VI presents the estimation results based on the dynamic GMM estimator. In regression analysis, the Altman *Z*-score is used as a proxy of financial distress (FD_{it}) and appeared as a dependent variable in the estimations, while ownership structure

Table VI Impact of ownership structure on firm financial distress

Dependent variable: financial distress (FD_{it}) Variables	Model 1	Model 2	Model 3	Model 4
FD_{it-1}	0.119*** (7.92)	0.082*** (4.17)	0.099*** (5.88)	0.094*** (5.77)
$INSO_{it}$	−0.563 (−1.07)	–	–	–
IO_{it}	–	8.187 (0.86)	–	–
FO_{it}	–	–	−0.268 (−0.02)	–
GO_{it}	–	–	–	70.968 (0.83)
Siz_{it}	−0.151*** (−5.36)	−0.786** (−2.06)	−0.950*** (−2.68)	−0.926*** (−2.78)
PM_{it}	−0.176 (−1.09)	0.037 (0.22)	0.007 (0.04)	0.022 (0.16)
Pr $atio_{it}$	−0.146* (−1.64)	−2.24*** (−3.89)	−2.67*** (−4.52)	−2.63*** (−4.83)
Lev_{it}	−20.69*** (−3.24)	−21.65*** (−16.77)	−21.04*** (−17.51)	−21.55*** (−19.15)
SG_{it}	−0.034 (−0.27)	2.06*** (3.17)	2.21*** (3.63)	2.24*** (4.08)
$J-statistic$	0.40	19.94	21.75	19.83
Pr $ob(J-statistic)$	80.01	0.89	0.83	0.89
Instrument rank	44	44	44	44

Notes: The; ***denotes 1%; **denotes 5% and; *denotes 10% level of significance; *t*-values are presented below the coefficients, in parenthesis

(institutional ownership, insider ownership, foreign ownership and government ownership) measures the corporate governance practices and is used as independent variables in the model. The results reveal that ownership structure exerts insignificant impact on the financial distress in all the cases. We observed that institutional ownership, insider ownership and government ownership have a positive sign, but produce insignificant impact on the financial distress, while foreign ownership produces an insignificant negative impact on the financial distress. Hence, we may deduce that corporate governance practices in the form of firm's ownership structure have no significant impact on the financial distress in Pakistan. These findings are consistent with those of Shahwan (2015). The main reason behind this result could be the low-quality corporate governance practices in Pakistan. Hence, there is a need for Pakistani firms to upgrade the level of their corporate governance practices. Our result did not confirm *H1*.

Among the control variables, firm size (Siz_{it}) and leverage (Lev_{it}) exert a significant negative impact on the financial distress. The negative coefficient of Siz_{it} suggests that as a firm's operational activities increase, the financial distress also increases. We also find a significant and negative relationship between financial distress (FD_{it}) and leverage (Lev_{it}). The negative coefficient of leverage suggests that a larger debt might increase the risk of financial failure due to increase in financial costs and repayment schedules of debts[11]. The other reason could be that in Pakistan debt-providing agencies do not play an active monitoring role in the utilization of debts and implementation of corporate governance at the firm level. Another reason could be the weak institutional control and political influence in retiring debts. This finding is consistent with Jiang *et al.* (2010). Finally, the lag-dependent variable is positive and significant in all the cases, implying that previous period's financial distress stimulates current financial distress.

4.3 Panel logistic regression results

The PLR results are reported in Table VII. It can be seen from the results (Model 1) that the coefficient of institutional ownership possesses a negative sign but is insignificantly related to the likelihood of financial distress. This implies that institutional shareholders exert an insignificant effect on the likelihood financial distress in selected companies in Pakistan. The reason of this finding could be the passive monitoring role of institutional investor on the management activities. This result is consistent with the earlier findings of Zeitun (2009) and Manzaneque *et al.* (2016). However, the coefficient of ownership structure turns to be positive when institutional ownership is taken as an independent variable. This finding implies that institutional investors play an active monitoring role in the managerial activities

Table VII Corporate governance and the likelihood of financial distress: logistic regression model

Dependent variable: likelihood of financial distress (Y_{it}) Variables	Model 1	Model 2	Model 3	Model 4
Constant	0.5074 (1.88)**	0.232 (0.83)	0.341 (1.09)	0.456 (1.45)
$INSO_{it}$	−0.563 (−1.07)	–	–	–
IO_{it}	–	0.568** (2.16)	–	–
FO_{it}	–	–	−2.260*** (−4.57)	–
GO_{it}	–	–	–	0.208 (0.46)
Siz_{it}	−0.151*** (−5.36)	−0.140*** (−4.88)	−0.128*** (−4.31)	−0.155*** (−4.92)
PM_{it}	−0.176 (−1.09)	−0.180 (−1.09)	−0.203 (−1.11)	−0.180 (−1.13)
Pr $atio_{it}$	−0.146* (−1.64)	−0.138 (−1.58)	−0.146 (−0.63)	−0.149 (−0.65)
Lev_{it}	0.69*** (3.24)	0.656*** (3.00)	0.732** (2.12)	0.702** (2.09)
SG_{it}	−0.034 (−0.27)	−0.033 (−0.26)	−0.039 (−0.24)	−0.032 (−0.20)
McFa R^2	0.40	0.42	0.47	0.40
LR statistic	80.01	83.56	92.75	79.08
Prob (LR statistic)	0.0000	0.0000	0.000	0.000

Notes: Financial distress is binary variable in logit is estimation technique, "1" for financially distressed and "0" for non-financially distressed firm. The ; ***denotes 1%; **denotes 5% and; *denotes 10% level of significance; *t*-values are presented below the coefficients, in parenthesis.

and keeps the company away from the financial distress. Javid and Iqbal (2008) noted that institutional investors are acknowledged for their passive attitude in Pakistan.

It is worth mentioning here that we cannot directly interpret the parameter estimates based on the PLR model. To obtain interpretable parameter estimates, we need to calculate the marginal effect of each coefficient. Table VIII presents the marginal effects.

The impact of foreign ownership on the likelihood of financial distress is negative and significant (Model 3). This implies that foreign shareholdings are an important determinant of corporate governance that reduces the likelihood of financial distress. The coefficient value of foreign ownership is −0.901 which implies that a 1 per cent increase in the foreign shareholdings would decrease the probability of financial distress by 0.901 per cent. One reason of this finding could be that the foreign owners are more professional and placed high-skilled monitoring and controlling system and provide more incentives to the managers, which motivates the mangers to enhance firm financial performance. The other reason could be that the transfer of technology and high-quality governance practices by foreign firms than the local firms may accelerate the pace of a firm's financial performance and reduce the likelihood of financial distress. However, due to lack of enabling investment environment, the flow of foreign portfolio investment is still limited in Pakistan. This finding

Table VIII Marginal effects for corporate governance and probability of financial distress

Variables	Model 1	Model 2	Model 3	Model 4
$INSO_{it}$	−0.144 (−1.44)	–	–	–
IO_{it}	–	0.254*** (3.85)	–	–
FO_{it}	–	–	−0.901** (−4.42)	–
GO_{it}	–	–	–	0.045 (0.33)
$Size_{it}$	−0.039*** (−5.57)	−0.0339*** (−4.76)	−0.030*** (−4.23)	−0.039*** (−5.37)
PM_{it}	−0.022 (−0.85)	−0.021 (−0.81)	−0.025 (−0.92)	−0.022 (−0.87)
Pr $atio_{it}$	−0.0093* (−0.7)	−0.0071 (−0.54)	−0.010 (−0.76)	−0.0099 (−0.74)
Lev_{it}	0.941*** (12.24)	0.924*** (11.98)	0.962*** (12.4)	0.938*** (12.22)
SG_{it}	−0.037 (−0.27)	−0.040 (−1.09)	−0.037 (−1.03)	−0.038 (−1.06)
No. of observations	1,457	1,457	1,457	1,457

Notes: ***; **and; *indicates significance at the rate of 1, 5 and 10% level. Model 1 = Marginal effects after logistic estimation; Y_{it} = Pr $o(FD_{it})$ = 0.43470914; Model 2 = Marginal effects after logistic estimation; Y_{it} = Pr $o(FD_{it})$ = 0.43360789; Model 3 = Marginal effects after logistic estimation; Y_{it} = Pr $o(FD_{it})$ = 0.43360789; Model 4 = Marginal effects after logistic estimation; Y_{it} = Pr $o(FD_{it})$ = 0.43360789

is in line with the findings of Rohani *et al.* (2013). However, Chaudhry *et al.* (2014) reported an insignificant impact of net foreign portfolio investment on the growth rate of mutual funds and trade openness. We find a positive and significant relationship between insider ownership and probability of financial distress (Model 2). The result reveals that a 1 per cent increase in insider shareholdings would increase the probability of financial distress by 0.254 per cent.

The government ownership exerts a positive but insignificant impact on the likelihood of financial distress (Model 4). This finding is inconsistent with Deng and Wang (2006), Li and McNally (2007), Zeitum (2009), Donker *et al.* (2009) and Rohani *et al.* (2013). The main reason could be that the motives of government-owned companies are to maximize social benefit rather than profit. Therefore, to enhance the firm's financial performance and to reduce the likelihood of firm financial distress, government shareholdings should be limited to some extent.

The coefficient of firm size is negative and significant in all four models. The negative coefficient of firm size implies that large companies have low risk of default due to their experiences and operational efficiency. Leverage is found to be positive and significant in all the cases, suggesting that debt financing can enhance the probability of financial distress. This result is not surprising in the case of Pakistan, because in Pakistan, financial institutions and other loan-providing agencies are not capable to monitor the usage of loans at the firm level. Furthermore, payout ratio, profit margin and sales growth are negatively related with the probability of financial distress. However, the effect of these variables are seems to be insignificant.

Overall, the results reported in Table VII.1 are statistically significant. McFadden R^2 values of all the models in Table VII are 0.40, 0.42, 0.47 and 0.40, indicating good fit of each model.

5. Conclusion

This study examines the impact of corporate governance on the likelihood of financial distress using sample of 146 non-financial firms listed on the KSE over the period 2003-2012. Based on the PLR, we find that corporate governance practices have a significant impact on the likelihood of firm financial distress, though; all measures of governance are not seemed to be statistically significant. Particularly, we find negative and insignificant impact of institutional ownership on the likelihood of financial distress. This indicates the passive role of institutional investors in Pakistan. We also find a positive and significant effect of insider's ownership on the likelihood of financial distress, which is consistent with the prediction of entrenchment hypothesis. It is also observed that foreign ownership is negative and significantly related with the likelihood of financial distress. The reason could be that foreign shareholders are more profit-oriented and have many incentives to monitor the company managers, which lowers the risk of financial distress. Furthermore, we find an insignificant effect of government ownership on the likelihood of financial distress. The reason of this insignificant relationship could that the primary objective of government-owned enterprises is social welfare rather than profit maximization. Moreover, the mean value of government shareholdings is found to be 3.1 per cent, which is less than foreign ownership[12]. Firm size has a negative and significant association with the likelihood of financial distress in all the cases, which implies that as the firm size increases, the probability of financial distress decreases. Leverage has a positive and significant impact on the likelihood of firm financial distress. The positive coefficient of leverage suggests that an increase in the volume of debt would lead to an increase in the probability of financial distress in all the cases. The other variables such as profit margin, payout ratio and sales growth of firm have negative insignificant association with the likelihood of firm financial distress.

The potential policy implications are: first, we find a negative and significant impact of foreign ownership on a firm's likelihood of financial failure. This relationship can be attributed due to the introduction of advanced technology by the foreign shareholders to the local firm and the management system that bail-out companies from financial failure. Therefore, there is a need to formulate investment policies in such a way that they may protect and encourage foreign investors to invest in Pakistan. Second, we obtained a significant positive relationship between insider ownership and the likelihood of firm financial distress. This indicates that insider shareholders in Pakistani capital markets are pursuing their self-interests rather than to maximize the wealth of outside shareholders. In fact, the major companies in Pakistan are categorized by concentrated ownership structure through cross-shareholdings (Thillainathan, 1999) and pyramid ownership structure (Claessens *et al.*, 2000), family business and large business groups. These controlled business preferred debt financing (loan from banks) rather than equity financing. The main reason of this could be the underdeveloped equity market, inactive capital market and weak corporate governance infrastructure. Therefore, there is need of regulations that discourage ownership concentration and self-interests of insider shareholders.

Although, the present study extends the understanding of corporate governance mechanism and its impact on the likelihood of financial distress in Pakistan. However, our findings are subject to some limitations. The present study focused only on one aspect of corporate governance (i.e. ownership structure) and used only one measure of financial distress (Altman *Z*-score). In future, researchers may use different proxies of financial distress such as *O*-score, *M*-distance to default and Shumway models to capture the impact of corporate governance on the probability of financial distress. Furthermore, internal governance measures can also be used to analyze the effect of corporate governance on the likelihood of financial distress.

Notes

1. A company is in financial distress if it is not able to pay its financial obligation. Financial distress is an embarrassing situation for a corporation not able to pay promising obligation at maturity and operating expenses. Due to this, corporations face liquidity problem, debt default and insufficiency of current assets.

2. We used the Altman *Z*-score as a proxy of financial distress and the score can be calculated as: $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$ Where X_1 = net working capital/total assets, X_2 = retained earnings/total assets, X_3 = earnings before interests and taxes (EBIT)/total assets, X_4 = market value of equity/book value of debt and X_5 = sales revenue/total assets (Altman, 1968).

3. The bigger the value of *Z*-score, the lower will be the risk of financial distress.

4. This test is suggested by the anonymous reviewer I. We are thankful to him.

5. Also see Table AII in appendix.

6. In our case, simultaneity means better corporate governance leads to better firm's financial performance which leads to lower probability of financial distress. On the other hand, better performance leads to better corporate governance compliance.

7. Details can be found in Section 3.5 of this paper.

8. "Foreign ownership is defined as percentage share held by companies which are incorporated outside Pakistan but have a place of business in Pakistan under the foreign companies Ordinance (1984). The Ordinance also defines a foreign subsidiary as a company in which more than 50 per cent of the equity is held by a single foreign company. In Pakistan, there is no legal limit for minimum and maximum level of equity holding by foreign investors as compare to India where no foreign investor holds more than 51 percent equity stakes of a firm" (Javid and Iqbal, 2008, p. 7].

9. "The National Investment Trust Ltd. (NITL) is the first and the largest Asset Management Company of Pakistan, formed in 1962. In recent years three new Funds namely, NIT Islamic Equity Fund, NIT

Pension Fund & NIT Islamic Pension Fund are launched. The size of total Funds under management by NITL is approximately Rs. 95 billion as of June 30, 2015. The NIT's distribution network comprises of 23 branches, various Authorized bank branches all over Pakistan. The Trust constituted under the Trust Deed dated 12th November 1962, executed between National Investment Trust Ltd (NITL) as Management Company and National Bank of Pakistan as Trustee"(ICMAP, (2011, pp. 1-2).

10. The Company Ordinance (1984) and the Code of Corporate Governance do not recognize minority shareholders with a shareholding below 10 Per cent. The minimum threshold for seeking remedy from the court against mismanagement and oppression requires initiation of the company by no less than 20 per cent of the shareholders. Shareholders representing 10 per cent can apply to SECP for appointment for inspector for investigation into the affairs of the company. For further detail, see Sections 263 and 290 of the Company Ordinance (1984).

11. A high *Z*-score indicates a sound financial conditions, while low *Z*-score implies financially distressed conditions.

12. According to Akhtar (2012), in Pakistan, 140 state-owned enterprises are operating in the commercial sector and 50 corporations are involved in the strategic sector, like in transport, energy and financial sector. State-owned enterprises (SOEs) of Pakistan contribute approximately 10 percent to the total output. In the KSE, 23 SOEs are listed and cover one-third of the market capitalization.

References

Ahmed Sheikh, N. and Wang, Z. (2012), "Effects of corporate governance on capital structure: empirical evidence from Pakistan", *Corporate Governance: The International Journal of Business in Society*, Vol. 12 No. 5, pp. 629-641.

Akbar, S., Poletti-Hughes, J., El-Faitouri, R. and Shah, S.Z.A. (2016), "More on the relationship between corporate governance and firm performance in the UK: evidence from the application of generalized method of moments estimation", *Research in International Business and Finance*, Vol. 38, pp. 417-429.

Akhtar, S. (2012), "Code of corporate governance for public sector enterprises", available at: epaper.brecorder.com/story2pdf.php?id=271100&ed=2012-04-13 (accessed 16 March 2016).

Alali, F., Anandarajan, A. and Jiang, W. (2012), "The effect of corporate governance on firm's credit ratings: further evidence using governance score in the United States", *Accounting and Finance*, Vol. 52 No. 2, pp. 291-312.

Alfaraih, M., Alanezi, F. and Almujamed, H. (2012), "The influence of institutional and government ownership on firm performance: evidence from Kuwait", *International Business Research*, Vol. 5 No. 10, pp. 192.

Al-Tamimi, H.A.H. (2012), "The effects of corporate governance on performance and financial distress: the experience of UAE national banks", *Journal of Financial Regulation and Compliance*, Vol. 20 No. 2, pp. 169-181.

Altman, E.I. (1968), "Financial ratios, discriminant analysis and the prediction of corporate bankruptcy", *The Journal of Finance*, Vol. 23, pp. 589-609.

Antoniou, A., Guney, Y. and Paudyal, K. (2008), "The determinants of capital structure: capital market-oriented versus bank-oriented institutions", *Journal of Financial and Quantitative Analysis*, Vol. 43 No. 1, pp. 59-92.

Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The Review of Economic Studies*, Vol. 58 No. 2, pp. 277-297.

Aydin, N., Sayim, M. and Yalama, A. (2007), "Foreign ownership and firm performance: evidence from Turkey", *International Research Journal of Finance and Economics*, Vol. 11, pp. 103-111.

Berle, A.A. and Gardiner, C.M. (1932), *The Modern Corporation and Private Property*, Macmillan, New York, NY.

Bhagat, S., Moyen, N. and Suh, I. (2005), "Investment and internal funds of distressed firms", *Journal of Corporate Finance*, Vol. 11 No. 3, pp. 449-472.

Black, B.S., Jang, H. and Kim, W. (2006), "Does corporate governance predict firms' market values? Evidence from Korea", *Journal of Law, Economics, and Organization*, Vol. 22 No. 2, pp. 366-413.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of econometrics*, Vol. 87 No. 1, pp. 115-143.

Charfeddine, L. and Elmarzougui, A. (2010), "Institutional ownership and firm performance: evidence from France", *The IUP Journal of Behavior Finance*, Vol. 7 No. 4, pp. 35-46.

Chaudhry, I.S., Farooq, F. and Mushtaq, A. (2014), "Factors affecting portfolio investment in Pakistan: evidence erom time series analysis", *Pakistan Economic and Social Review*, Vol. 52 No. 2, pp. 141-158.

Cheema, A. (2003), "Corporate governance in Pakistan: issues and concerns", *The NIPA Journal*, Vol. 8, pp. 7-19.

Chen, K.C., Wei, K.-C. and Chen, Z. (2003), "Disclosure, corporate governance, and the cost of equity capital: evidence from Asia's emerging markets", Working Paper Hong Kong University of Science and Technology, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=422000 (accessed 12 December 2015).

Cheung, W.A. and Wei, K.J. (2006), "Insider ownership and corporate performance: evidence from the adjustment cost approach", *Journal of Corporate Finance*, Vol. 12 No. 5, pp. 906-925.

Claessens, S., Djankov, S. and Xu, L.C. (2000), "Corporate performance in the East Asian financial crisis", *World Bank Research Observer*, Vol. 15, pp. 23-46.

Clay, D.G. (2001), "Institutional ownership, CEO incentives, and firm value", Unpublished doctoral dissertation, University of Chicago, Chicago, IL.

Cornett, M.M., Marcus, A.J., Saunders, A. and Tehranian, H. (2007), "The impact of institutional ownership on corporate operating performance", *Journal of Banking and Finance*, Vol. 31 No. 6, pp. 1771-1794.

Cutting, B. and Kouzmin, A. (2000), "The emerging patterns of power in corporate governance-back to the future in improving corporate decision making", *Journal of Managerial Psychology*, Vol. 15 No. 5, pp. 477-507.

Cutting, B. and Kouzmin, A. (2000), "The emerging patterns of power in corporate governance-back to the future in improving corporate decision making", *Journal of Managerial Psychology*, Vol. 15, pp. 477-507.

Dahlquist, M. and Robertsson, G. (2001), "Direct foreign ownership, institutional investors, and firm characteristics", *Journal of Financial Economics*, Vol. 59 No. 3, pp. 413-440.

Daily, C.M. and Dalton, D.R. (1994), "Bankruptcy and corporate governance: the impact of board composition and structure", *Academy of Management Journal*, Vol. 37, pp. 1603-1617.

De Alessi, L. (1980), "The economics of property rights: a review of the evidence", *Research in Law and Economics*, Vol. 2, pp. 1-47.

Donker, H., Santen, B. and Zahir, S. (2009), "Ownership structure and the likelihood of financial distress in the Netherlands", *Applied Financial Economics*, Vol. 19 No. 21, pp. 1687-1696.

Duggal, R. and Millar, J.A. (1999), "Institutional ownership and firm performance: the case of bidder returns", *Journal of Corporate Finance*, Vol. 5 No. 2, pp. 103-117.

Dwivedi, N. and Jain, A.K. (2005), "Corporate governance and performance of Indian firms: the effect of board size and ownership", *Employee Responsibilities and Rights Journal*, Vol. 17, pp. 161-172.

Elloumi, F. and Gueyie, J.-P. (2001), "Financial distress and corporate governance: an empirical analysis", *Corporate Governance: The International Journal of Business in Society*, Vol. 1 No. 1, pp. 15-23.

Elyasiani, E. and Jia, J. (2010), "Distribution of institutional ownership and corporate firm performance", *Journal of Banking and Finance*, Vol. 34 No. 3, pp. 606-620.

Fich, E.M. and Slezak, S.L. (2008), "Can corporate governance save distressed firms from bankruptcy? An empirical analysis", *Review of Quantitative Finance and Accounting*, Vol. 30 No. 2, pp. 225-251.

Francis, J. and Smith, A. (1995), "Agency costs and innovation some empirical evidence", *Journal of Accounting and Economics*, Vol. 19, pp. 383-409.

He, X., Chakrabarty, S. and Eden, L. (2016), "The global emergence of Chinese multinationals: a resource-based view of ownership and performance", *Asian Business and Management*, Vol. 15, pp. 1-31.

Heard, J.E. and Sherman, H.D. (1987), *Conflicts of Interest in the Proxy Voting System*, Investor Responsibility Research Center, Washington, DC.

Henry, D. (2010), "Agency costs, ownership structure and corporate governance compliance: a private contracting perspective", *Pacific-Basin Finance Journal*, Vol. 18 No. 1, pp. 24-46.

Himmelberg, C.P., Hubbard, R.G. and Palia, D. (1999), "Understanding the determinants of managerial ownership and the link between ownership and performance", *Journal of Financial Economics*, Vol. 53, pp. 353-384.

Hodgson, A., Lhaopadchan, S. and Buakes, S. (2011), "How informative is the Thai corporate governance index? A financial approach", *International Journal of Accounting and Information Management*, Vol. 19 No. 1, pp. 53-79.

Holthausen, R.W., Larcker, D.F. and Sloan, R.G. (1995), "Annual bonus schemes and the manipulation of earnings", *Journal of Accounting and Economics*, Vol. 19, pp. 29-74.

Javed, A.Y. and Iqbal, R. (2007), "Relationship between corporate governance indicators and firm value: a case study of Karachi Stock Exchange", PIDE Working Papers 2007:14, Pakistan Institute of Development Economics, Islamabad.

Javid, A.Y. and Iqbal, R. (2008), "Ownership concentration, corporate governance and firm performance: evidence from Pakistan", *The Pakistan Development Review*, Vol. 47 No. 4, pp. 643-659.

Javid, A.Y. and Iqbal, R. (2010), "Corporate governance in Pakistan: corporate valuation, ownership and financing", PIDE Working Paper. Working Papers 2010:57, Pakistan Institute of Development Economics Islamabad.

Jensen, M.C. (1993), "The modern industrial revolution, exit, and the failure of internal control systems", *The Journal of Finance*, Vol. 48 No. 3, pp. 831-880.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Jiang, G., Lee, C.M. and Yue, H. (2010), "Tunneling through intercorporate loans: the China experience", *Journal of Financial Economics*, Vol. 98 No. 1, pp. 1-20.

Kamel, H. and Shahwan, T. (2014), "The association between disclosure level and cost of capital in an emerging market: evidence from Egypt", *Afro-Asian Journal of Finance and Accounting*, Vol. 4 No. 3, pp. 203-225.

Karachi Stock Exchange (2007/2012), *Annual reports of Karachi Stock Exchange (2007-2008 and 2011-2012)*, Karachi Stock Exchange, Pakistan.

Khanna, T. and Palepu, K. (1999), "Emerging market business groups, foreign investors, and corporate governance", NEBR working paper No. 6955, National Bureau of Economic Research.

Kim, J. and Yi, C. (2004), "Foreign equity ownership and corporate transparency in emerging markets: evidence from Korea", *Conference Paper: CAAA Annual Conference*, Vancouver, 27-30 May.

Kim, J.B. and Yi, C.H. (2006), "Ownership structure, business group affiliation, listing status, and earnings management: evidence from Korea", *Contemporary Accounting Research*, Vol. 23 No. 2, pp. 427-464.

Kumar, J. (2004), "Does ownership structure influence firm value? evidence from India", *The Journal of Entrepreneurial Finance and Business Ventures*, Vol. 9, pp. 61-93.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A. and Vishny, R. (2000), "Investor protection and corporate governance", *Journal of Financial Economics*, Vol. 58, pp. 3-27.

Lee, T.S. and Yeh, Y.H. (2004), "Corporate governance and financial distress: evidence from Taiwan", *Corporate Governance: An International Review*, Vol. 12, pp. 378-388.

Li, K. and McNally, W. (2007), "The information content of Canadian open market repurchase announcements", *Managerial Finance*, Vol. 33 No. 1, pp. 65-80.

Li, Y. and Peng, M.W. (2008), "Developing theory from strategic management research in China", *Asia Pacific Journal of Management*, Vol. 25 No. 3, pp. 563-572.

Lichtenberg, F.R. and Pushner, G.M. (1994), "Ownership structure and corporate performance in Japan", *Japan and the World Economy*, Vol. 6, pp. 239-261.

Lim, S., Matolcsy, Z. and Chow, D. (2007), "The association between board composition and different types of voluntary disclosure", *European Accounting Review*, Vol. 16 No. 3, pp. 555-583.

McConnell, J.J. and Servaes, H. (1990), "Additional evidence on equity ownership and corporate value", *Journal of financial economics*, Vol. 27 No. 2, pp. 595-612.

McKinsey (2002), *Global Investor Opinion Survey on Corporate Governance*, McKinsey and Company, OECD.

Mangena, M. and Chamisa, E. (2008), "Corporate governance and incidences of listing suspension by the JSE securities exchange of South Africa: an empirical analysis", *The International Journal of Accounting*, Vol. 43 No. 1, pp. 28-44.

Manzaneque, M., Priego, A.M. and Merino, E. (2016), "Corporate governance effect on financial distress likelihood: evidence from Spain", *Revista De Contabilidad*, Vol. 19 No. 1, pp. 111-121.

Md-Rus, R., Mohd, K.N.T., Latif, R.A. and Alassan, Z.N. (2013), "Ownership structure and financial distress", *Journal of Advanced Management Science*, Vol. 1 No. 4, pp. 363-367.

Morck, R., Shleifer, A. and Vishny, R.W. (1988), "Management ownership and market valuation: an empirical analysis", *Journal of Financial Economics*, Vol. 20, pp. 293-315.

Mueller, D.C., Dietl, H. and Peev, E. (2003), "Ownership, control and performance in large Bulgarian firms", *Journal for Institutional Innovation, Development and Transition*, Vol. 7 No. 1, pp. 71-88.

Muranda, Z. (2006), "Financial distress and corporate governance in Zimbabwean banks", *Corporate Governance: The International Journal of Business in Society*, Vol. 6 No. 5, pp. 643-654.

Nahar Abdullah, S. (2006), "Board structure and ownership in Malaysia: the case of distressed listed companies", *Corporate Governance: The International Journal of Business in Society*, Vol. 6 No. 2, pp. 582-594.

Nakano, M. and Nguyen, P. (2012), "Board size and corporate risk taking: further evidence from Japan", *Corporate Governance: An International Review*, Vol. 20 No. 4, pp. 369-387.

Narayanaswamy, R., Raghunandan, K. and Rama, D.V. (2012), "Corporate governance in the Indian context", *Accounting Horizons*, Vol. 26 No. 3, pp. 583-599.

Nguyen, T., Locke, S. and Reddy, K. (2014), "A dynamic estimation of governance structures and financial performance for Singaporean companies", *Economic Modelling*, Vol. 40, pp. 1-11.

OECD (2008), *Introductory Handbook for Undertaking Regulatory Impact Analysis (RIA)*, Organisation for Economic Co-operation and Development, available at: www.oecd.org/gov/regulatory-policy/44789472.pdf

Ongore, V.O. (2011), "The relationship between ownership structure and firm performance: an empirical analysis of listed companies in Kenya", *African Journal of Business Management*, Vol. 5 No. 6, pp. 2120-2128.

Oxelheim, L. and Randøy, T. (2003), "The impact of foreign board membership on firm value", *Journal of Banking and Finance*, Vol. 27 No. 12, pp. 2369-2392.

Palia, D. and Lichtenberg, F. (1999), "Managerial ownership and firm performance: a re-examination using productivity measurement", *Journal of Corporate Finance*, Vol. 5, pp. 323-339.

Parker, S., Peters, G.F. and Turetsky, H.F. (2002), "Corporate governance and corporate failure: a survival analysis", *Corporate Governance: The International Journal of Business in Society*, Vol. 2 No. 2, pp. 4-12.

Pound, J. (1988), "Proxy contests and the efficiency of shareholder oversight", *Journal of Financial Economics*, Vol. 20, pp. 237-265.

Prowse, S. (1998), Corporate Governance in East Asia: a framework for analysis, World Bank, mimeo.

Rajan, R.G. and Zingales, L. (1997), "Power in a theory of the firm", NBER Working Paper No. 6874: National Bureau of Economic Research.

Ramaswamy, K., Li, M. and Veliyath, R. (2002), "Variations in ownership behavior and propensity to diversify: a study of the Indian corporate context", *Strategic Management Journal*, Vol. 23, pp. 345-358.

Reddy, K., Locke, S. and Scrimgeour, F. (2010), "The efficacy of principle-based corporate governance practices and firm financial performance: an empirical investigation", *International Journal of Managerial Finance*, Vol. 6 No. 3, pp. 190-219.

Rehmans, R. and Mangla, I.U. (2010), "Corporate governance and performance of financial institutions in Pakistan: a comparison between conventional and Islamic banks in Pakistan", *The Pakistan Development Review*, Vol. 49 No. 4, pp. 461-475.

Saifullah, M. (2012), "Relationship between corporate governance score and stock prices: evidence from KSE-30 index companies", *International Journal of Business and Social Sciences*, Vol. 3 No. 4, pp. 239-249.

Sarkar, J. and Sarkar, S. (2000), "Large shareholder activism in corporate governance in developing countries: evidence from India", *International Review of Finance*, Vol. 1, pp. 161-194.

Sarkar, J. and Sarkar, S. (2008), "Debt and corporate governance in emerging economies: evidence from India", *Economics of Transition*, Vol. 16 No. 2, pp. 293-334.

Shaheen, R. and Nishat, M. (2005), "Corporate governance and firm performance- an exploratory analysis", *5th Corporate Governance Conference organized by Lahore University of Management Sciences (LUMS)*, available at: http://cmer.lums.edu.pk/Conference2005/images/Rozina%20and%20Dr.Nishat%20corporate%20Governance.pdf

Shahwan, T.M. (2015), "The effects of corporate governance on financial performance and financial distress: evidence from Egypt", *Corporate Governance: The International Journal of Business in Society*, Vol. 15 No. 5, pp. 641-662.

Shapiro, C. and Willig, R. (1990), "Economic rationales for the scope of privatization", in Suliman, E. and Waterbury, J. (Eds), *The Political Economy of Public Sector reforms and Privatizations*, Westview Press, Boulder, CO.

Shleifer, A. and Vishny, R.W. (1986), "Large shareholders and corporate control", *Journal of Political Economy*, Vol. 94 No. 3, pp. 461-488.

Shyu, J. (2013), "Ownership structure, capital structure, and performance of group affiliation: evidence from Taiwanese group-affiliated firms", *Managerial Finance*, Vol. 39 No. 4, pp. 404-420.

State Bank of Pakistan (2007/2010), *Financial Statements Analysis of Companies (Non-Financial): Listed at Karachi Stock Exchange*, State Bank of Pakistan, Karachi.

Strandskov, J. (2006), "Sources of competitive advantages and business performance", *Journal of Business Economics and Management*, Vol. 7 No. 3, pp. 119-129.

Subramanian, S. and Reddy, V.N. (2012), "Corporate governance disclosures and international competitiveness: a study of Indian firms", *Asian Business and Management*, Vol. 11, pp. 195-218.

Swain, K.R. (2009), "Corporate governance in India: the case of HDFC Bank", *IUP Journal of Corporate Governance*, Vol. 8 Nos 3/4, pp. 119-131.

Tariq, Y.B. and Abbas, Z. (2013), "Compliance and multidimensional firm performance: evaluating the efficacy of rule-based code of corporate governance", *Economic Modelling*, Vol. 35, pp. 565-575.

Thillainathan, R. (1999), "Role of shareholder, directors and managers in corporate governance", paper presented at *The World Bank Conference*, Washington, DC.

Thomsen, S. and Pedersen, T. (2000), "Ownership structure and economic performance in the largest European companies", *Strategic Management Journal*, Vol. 21, pp. 689-705.

Ting, I.W.K. and Lean, H.H. (2015), "Does government ownership matter? comparative study between GLCS and NGLCS in Malaysia", *The Singapore Economic Review*, Vol. 60 No. 2, pp. 1-22.

Uwuigbe, U. and Olusanmi, O. (2012), "An empirical examination of the relationship between ownership structure and the performance of firms in Nigeria", *International Business Research*, Vol. 5 No. 1, p. 208.

Vickers, J. and Yarrow, G. (1997), "Privatization-an economic analysis", *Comparative Economic Studies*, Vol. 39 Nos 3/4, pp. 90-95.

Wahba, H. (2015), "The joint effect of board characteristics on financial performance: empirical evidence from Egypt", *Review of Accounting and Finance*, Vol. 14 No. 1, pp. 20-40.

Wang, Z.-J. and Deng, X.-L. (2006), "Corporate governance and financial distress: evidence from Chinese listed companies", *Chinese Economy*, Vol. 39, pp. 5-27.

Whitaker, R.B. (1999), "The early stages of financial distress", *Journal of Economics and Finance*, Vol. 23, pp. 123-132.

Wintoki, M.B., Linck, J.S. and Netter, J.M. (2010), "Endogeneity and the dynamics of internal corporate governance", available at SSRN: http://com/abstract=970986

Woidtke, T. (2002), "Agents watching agents: evidence from pension fund ownership and firm value", *Journal of Financial Economics*, Vol. 63 No. 1, pp. 99-131.

Wruck, K.H. (1990), "Financial distress, reorganization, and organizational efficiency", *Journal of Financial Economics*, Vol. 27, pp. 419-444.

Yoo, T. and Koh, Y. (2014), "Agent or structure for principal–principal conflicts? Audit firms versus foreign ownership in the Asian context", *Asian Business & Management*, Vol. 13 No. 4, pp. 309-332.

Zeitun, R. (2009), "Ownership structure, corporate performance and failure: evidence from panel data of emerging market the case of Jordan", *Corporate Ownership and Control*, Vol. 6 No. 4, p. 96.

Further reading

Borisova, G., Brockman, P., Salas, J.M. and Zagorchev, A. (2012), "Government ownership and corporate governance: evidence from the EU", *Journal of Banking and Finance*, Vol. 36 No. 11, pp. 2917-2934.

Appendix

Table AI Distribution of listed manufacturing companies at the KSE by economic groups

Economic groups		*2011*	*2012*
1.	Textile	155	155
	Spinning, weaving, finishing of textiles	137	138
	Made-up textile articles	6	6
	Other textiles	12	11
2.	Food	54	50
	Sugar	36	32
	Other food products	18	18
3.	Chemicals, chemical products and pharmaceuticals	43	43
4.	Other manufacturing	30	31
5.	Other non-metallic mineral products	28	28
	Cement	20	20
	Mineral products	8	8
6.	Motor vehicles, trailers and auto parts	22	22
7.	Fuel and Energy	18	19
8.	Information, communication and transport services	18	18
9.	Coke and refined petroleum products	9	9
10.	Paper, paperboard and products	9	9
11.	Electrical machinery and apparatus	8	8
12.	Other services activities	10	10
	Total	399	397

Source: Financial statement analysis of companies (non-financial sector) listed joint-stock companies at the KSE (2007/2012), published by State Bank of Pakistan, Statistics and DWH Department

Table AII Classification of variables, explanation of variables and data sources

Variables	*Symbol*	*Definition*	*Source*
Independent variables: ownership identity			
Insider ownership	IO_{it}	Number of shares held by the company's executives divided by the number of common shares outstanding	Annual reports of the companies
Institutional ownership	$INSO_{it}$	Financial institutions' shareholding is equity shares held by the government companies as percentage of total equity shares. These includes insurance companies, mutual funds, financial institutions, banks, central and state government's firms, state financial corporations and other government bodies	Annual reports of the companies
Foreign ownership	FO_{it}	The share held by foreigners as percentage of total equity shares. These include foreign collaborators, foreign financial institutions and foreign nationals	Annual reports of the companies
Government ownership	GO_{it}	Government shareholding is equity held in corporate bodies as a percentage of total equity shares	Annual reports of the companies
Dependent variables: financial distress			
Z-score	FD_{it}	The Altman *Z*-score is used to construct financial distress index as: Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.0999X5. Where X1 = net working capital/total assets, X2 = retained earnings/total assets, X3 = Earnings before interests and taxes (EBIT)/total assets, X4 = market value of equity and preferred stock/book value of debt and X5 =sales revenue/total assets	Self-constructed
Control variables			
Net profit margin	PM_{it}	Net income over net sales	Balance sheet analysis
Firm size	Siz_{it}	Natural log of market capitalization	Balance sheet analysis
Payout ratio	Pr $atio_{it}$	Cash dividend to common shareholders/Number of common shares	Calculated by authors
Leverage	Lev_{it}	The debt to total assets ratio is an indicator of financial leverage. Debt to Asset = Total Debt/Total Asset	Balance sheet analysis
Sales growth	SG_{it}	(Current year sales minus previous year sales)/previous year sales	Calculated by authors

Table AIII Correlation matrix

Variables	$Z-score_{it}$	$Z-score_{it-1}$	Lev_{it}	SG_{it}	Siz_{it}	Pr $atio_{it}$	PM_{it}
$Z-score_{it}$	1.000	–	–	–	–	–	–
$Z-score_{it-1}$	0.818***	1.000	–	–	–	–	–
Lev_{it}	−0.315***	−0.277***	1.000	–	–	–	–
SG_{it}	0.028	−0.015	−0.016	1.000	–	–	–
Siz_{it}	0.120***	0.124***	−0.268***	0.059**	1.000	–	–
Pr $atio_{it}$	0.023	0.034	−0.055**	0.006	0.105***	1.000	
PM_{it}	0.026	0.028	−0.108***	0.059**	0.059**	0.012	1.000
$INSO_{it}$	−0.025	−0.025	−0.002	0.002	−0.048	0.035	0.000
IO_{it}	−0.055**	−0.061**	0.065**	−0.024	−0.325***	−0.085***	0.023
FO_{it}	0.034	0.030	−0.037	0.011	0.233***	0.052**	0.003
GO_{it}	0.056**	0.058**	−0.122***	−0.009	0.350***	0.004	0.020

Notes: ***Significance at the 1% level (two-tailed); **significance at the 5% level (two-tailed)

Corresponding author

Shahab Udin can be contacted at: shahab_53129@hotmail.com