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Moderating Effect of Managerial Ability in the Relationship between Corporate Governance Features and Financial Distress Likelihood: (PLS Approach)

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ABSTRACT

The purpose of this research is to examine the effect of ownership structure and audit features on the financial distress likelihood by considering the moderating effect of managerial ability. The research utilized partial least squares structural equations modeling (PLS- SEM) analysis and data from 107 firms listed in the Tehran Stock Exchange. Audit features measured by auditor size and audit opinion and ownership structure measured by the block-holder ownership and institutional ownership. Backward logit analysis was used to calculate the financial distress likelihood. DEA technique and Tobit regression were used to measure the managerial ability. The results of study show that audit features have a positive effect on the likelihood of financial distress. Moreover, the effect of ownership structure on the financial distress likelihood and the moderating effect of managerial ability were not confirmed. This paper offers evidence on the extent to which distress is associated with corporate governance and managerial ability from a developing country. The paper should be of interest to the regulatory bodies and practitioners, because in many developing countries the implementation of corporate governance mechanisms is voluntary and is not yet required.

1 Introduction

The rate of financial crises in recent years around the world is greater than ever. Bankruptcy of big companies and financial scandal of some companies' points to the growing need for deeper researches in the scope of financial distress. Financial distress refers to a situation where a business has failed to meet its financial obligations [64]. Financial distress and the bankruptcy process exert direct and indirect costs on the troubled firm, as well as the economy as a whole [19; 48]. The process of reaching the condition of distress is also a "cost" imposed on the value of the pre-distressed firm [19]. In Iran, the adverse macroeconomic conditions have created problems for many industries and companies, leading them to financial distress and bankruptcy in recent years. Macroeconomic conditions (as external factors

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of failure) greatly intensify the occurrence of failure all the industries [6]. A problem that arises here is that while macroeconomic conditions affect all the industries and companies, how some companies overcome bad macroeconomic conditions and on the contrary, some get into financial distress. In other words, what factors have prevented the financial distress of resistant companies? Identifying the factors that prevent companies from getting into financial distress during difficult economic conditions provides useful guidance for future micro and macro planning [38]. A review of the literature shows that the impact of corporate governance (CG) and management abilities on corporate success are more pronounced in times of crisis. The economic and monetary crisis in 1997–1998 increased the attention on CG in Asia [30]. Years later, financial crisis in 2008 and financial scandals in Enron, World COM, Lehman Brothers, AIG and others have given attention to researchers and policy-makers to evaluate the effect of CG on performance and financial distress. The role of corporate governance in reducing financial distress remains a main issue nowadays [70; 14].

A study of above failed companies indicates that there was a lack of consistence policies, control procedures and mechanisms to ensure accountability and fiduciary duty [43]. CG has an important role in company's accountability and transparency [65]. Companies with weak CG might have lost more competitiveness than otherwise would have been, and hence are more vulnerable to financial distress [45]. Once in distress, firms with weak governance do not enough capacity to make the necessary adjustments to avoid bankruptcy [26]. The agency problems are more serious and intense in financial distress situation compared to normal condition [23]. The adoption of high quality CG mechanisms as a tool for controlling the agency problem leads to a high level of performance and prevents financial distress likelihood [71]. In Iran and many emerging markets, we faced with the issue of no legal requirement for the implementation of some corporate governance mechanisms. When there is no specific legal requirement for CG and the implementation of CG mechanisms is voluntary, identifying the factors that contribute to better implementation and improvement of CG is important. The results of some research suggest that capable and intelligent managers can improve CG [21]. Therefore, managerial ability is likely to affect the relationship between CG and financial distress. A higher managerial ability could lead to a more efficient management of day-to-day operations, mainly in critical periods when managerial decisions could have a significant impact on the firm performance. In addition, in time of crisis, the capable managers make better decisions about providing the required resources [67]. More talented managers are more aware of business activities and are better at estimating and judging their business, so they can increase business performance and reduce the risk of business failure [57]. One of the aims of the study is to examine the impact of corporate governance features on the financial distress likelihood. Although many studies have examined the impact of corporate governance on the financial distress in advanced countries such as USA, China and Australia, limited studies are conducted in the context of emerging markets, mainly in Asia emerging markets [7].

Corporate governance and organizational structure of the firms are very important in emerging markets [57]. The corporate governance mechanism, legal system and disclosure requirements are different in emerging markets as compared to the emerged markets. Furthermore, the relationship between corporate governance mechanisms and financial distress varies from country to country [81]. Therefore, conducting this study in the Iran' capital market as an emerging market seems necessary. The main innovation of the research is that, unlike previous studies, it also investigates the effect of managerial ability on this relationship. To the best of our knowledge, no study has examined the moderating effect of managerial ability, and this research seeks to fill this gap in the literature on managerial ability, corporate governance and financial distress. In this study, we used structural equation modeling (SEM)

to data analysis. Because the corporate governance features are not directly measurable. SEM is also better in identifying the cause-effect relationship between variables. The use of SEM in corporate governance research has steadily increased. SEM is a data analysis technique designed to assess relationship existing across both observed and latent variables [7]. Corporate governance and some related concepts that are addressed in various research (i.e. internal and external mechanisms, characteristics of the board, monitoring mechanisms, ownership structure, audit features) are not directly measurable. In SEM, the immeasurable concepts are considered as constructs that are approximated by several indicators (measurable variables) [7]. In this research, ownership structure and audit features are latent variable. We also estimated a probability model of financial distress using backward logit analysis to calculate the financial distress likelihood as dependent variable. The estimation of this model seemed necessary because in many of the research in Iran, Article 141 of the Commercial Code has been considered as a criterion for the separation of companies into financially distressed. Considering the inclusion scope of the financial distress in the theoretical framework of this research, it is not possible to identify all financial distress companies using the legal definition of failure.

Many financially distressed firms never file for a bankruptcy [9]. Therefore, the mere use of Article 141 of the Commercial Code is not correct and we must use a procedure that also identifies other financially distressed companies. The study seeks to reform the current literature in this field in Iran. Therefore, other criteria were used to separate financially distressed companies, which are explained in the research variables section. The results of backward logit analysis to estimate the financial distress likelihood and discrimination ability of the model are also presented. The remainder of the paper is organized as follows. Section 2 discusses the literature related to the financial distress, relationship between corporate governance features and financial distress and managerial ability. In section 3 we present the methodology of research including the conceptual model and variables. In section 4 we present the result of Structural equation modelling analysis. Section 5 concludes the research by reporting the main findings, their implications for company owners, investors and practitioners, limitations and avenues for future research.

2 Literature Review and Hypothesis Development

2.1 Financial Distress

There is a lack of a consistent definition of financial distress. By reviewing various studies on financial distress, and especially with regarding the stages of financial failure proposed by Newton [59], the numerous ways in defining of unsuccessful business proposed by Altman and Hotchkiss [6] and the categorization of business failure by Danilov [19], we define financial distress in this way. Financial distress refers to a situation where a firm cannot meet its current obligations. Such a company may have more assets than liabilities, but the company suffers from the liquidity problem. If the company were to be liquidated, in theory there would be at least enough proceeds generated by the sale of assets to repay all of the creditors in full [19]. In a more critical situation, a firm finds itself in a situation that its total liabilities exceed a fair valuation of its total assets. That is, the real net worth of the firm is negative [6]. Therefore, creditors would not be repaid in full if the company was liquidated [19]. This definition illustrates the scope of financial distress. Being in either of these situations does not necessarily lead to legal bankruptcy or company death. A company that fails to meet its obligations in both of the above forms can take two corrective actions: 1. Out-of-court workout (agreement with creditors), and 2. Bankruptcy filing [6, 59]. In many advanced countries, bankruptcy filings are not the same as liquidation, and the company may continue with restructuring process (e.g. Chapter 11 of the US Bankruptcy code).

2.2 Corporate Governance

The Organisation for Economic Co-operation and Development (OECD) defined Corporate Governance as "a set of relationships between a company's management, its board, its shareholders and other stakeholders" [2]. Corporate governance is one of the most important issues discussed around the world and represents a critical part that improves the success of corporations and their performances [56; 3]. Corporate governance is a set of internal and external mechanisms that determines how and by whom firm is managed [40]. In this section, for the purpose of this research, the relationship between ownership structure and audit features with financial distress is explained.

2.2.1 Ownership Structure and Financial Distress

In the study, ownership structure is measured by institutional ownership and block holder ownership**.** When the concentration of ownership is high, large shareholders can easily control the company [37]. According to Claessens et al. [17], large shareholders could suffer great losses due to their participation in a financial distressed company. In this sense, they are expected to exercise an important monitoring function on opportunistic management behaviour. Consequently, concentrated ownership reduces the agency problem [12]. Contrarily, according to Jensen [35] some studies argue that in concentrated context, ownership concentration may lead to information asymmetries between large and minority shareholders. So, according to La Porta et al. [42] , large shareholders may have influence on management and guide it into their personal benefit regardless of the interests of minority shareholders [52].
In this case, minority shareholders could suffer expropriation of their wealth, and consequently, financial distress likelihood of companies will increase [45]. Accordingly, the effect of ownership concentration on financial distress likelihood is unclear. Institutional ownership indicates the firm's shares held by various institutions such as commercial banks, insurance companies, investment banks and other corporations [58]. According to Bennett et al. [13], the role of institutional shareholders depends on their investment strategy and their incentives and ability to involve themselves in the firm's governance and the process of business decision making. David and Kochar [20] categorize institutional shareholders into two subgroups: pressure-resistant and pressure-sensitive. Pressure-resistant institutional shareholders are those less subject to influence from management because they have no commercial relationship with the company (investment funds, pension funds, venture capital and holding companies). While pressure-sensitive institutional shareholders are sensitive to management because they may obtain benefits from the business activities of the firm in which they are owners (mainly financial institutions) [51]. Therefore, if pressure-sensitive institutional shareholders have an interventionist position in the firm, its managers may prevent this intervention by cutting off the business relationship. David and Kochar [20] explained three important barriers that can limit monitoring effectiveness and reduce the usefulness of institutional ownership. They are: a) relationships of institutional investors with firms in which they invest, b) regulatory barriers, arising government regulations that constrain the activities of these investors, and c) information-processing barriers, arising from limitations on their ability to fully process the information required to monitor the firms in their portfolio. According to the above, the following hypothesis is proposed:
H_1. Ownership structure has a significant effect on the financial distress likelihood.

2.2.2 Audit Opinion and Financial Distress

In this study, audit features are measured by audit opinion and auditor size. An unsatisfactory audit opinion indicates the existence of hidden risk in a firm and has predictive power in determining the financial distress potential. Citron and Taffler [16] and Hudaib and Cooke [33] reported that financially

distressed firms are more likely to receive a qualified audit report. But Sikka [72] shows that distressed financial firms, whether in the UK, USA, Germany, Iceland, Netherlands, France or Switzerland, received unqualified audit opinions on their financial statements published immediately prior to the public declaration of financial difficulties. These opinions provided by one of the Big Four accounting firms.

According to Warren [80], prior studies provide evidence that large audit firms are more likely to issue a qualified audit opinion compared to smaller ones. Dye [24] suggests that because of their "deeper pockets" they are more likely to disclose problems because of their higher risk exposure. Therefore, financially distressed firms are less likely to use one of the Big Four audit firms for fear of disclosing financial problems, [55]. But the results of some research, such as Louis [49], Bauwhede and Willekens [11] show that large audit firms do not always offer better audit quality than small audit firms [29]. According to the above, the following hypothesis is proposed:

H_2. Audit features have a significant effect on the financial distress likelihood.

2.3 Managerial Ability

Managerial ability is an important characteristic which firms consider to the employment and pay the compensation because of managerial ability can affect the optimal resources allocation [4]. Manager's ability to engage in firms can be one of the most critical and determinant factors in the success or failure of the firm's performance [66]. According to Hitt et al. [31] and Kor [41], managerial ability is defined "as the knowledge, skills, and experience, which is often tacit, residing with and utilized by managers". From a strategic perspective, managerial ability derives from two main sources: domain expertise and resource expertise. According to Spreitzer et al [74] and Kor [41], domain expertise refers to managers' understanding of the industry context and the firm's strategies, products, markets, task environments, and routines. According to Collins et al. [18], domain expertise is gained through formal education in a specific field and through "learning by doing". According to Sirmon et al. [73], resource expertise is gained through experience with resource management processes. Specifically, it represents the managerial ability to select and configure a firm's resource portfolio, bundle resources into distinctive combinations, and deploy them to exploit opportunities in special contexts. Although it seems logical to expect that managers only use their best resources, some conditions prevent it [32].

For ability, factors studied have included age, education, experience, training, personality trait, objectives, job satisfaction, communication ability, planning and many other factors [60]. Many research, especially in the financial field, have used criteria such as past abnormal performance, adjusted stock returns, return on assets and efficiency to measure managerial ability. The reasons for measuring managerial abilities based on such criteria can be found in the discussion of managerial control [36] in the modernist view. In the modernist view, two types of behavioural and output control are used to control the desirable level of performance. Behavioural control is based on observation and monitoring of behaviour, but output control is based on measuring work outcomes. Whether behavioural or output control is selected depends on the cost of data collection. If behaviour monitoring requires the use of additional layers of management or the creation of advanced information systems such as cost accounting, budgeting and formal reporting, behavioural control will be costly and the use of output control seems more appropriate. Managers' performance evaluation based on overall performance criteria of the company such as profitability and earnings reduces agency problems between owners and managers. Measuring managerial abilities by the firm efficiency is according to the modernist view about the purpose and the focus of power. Because in the modernist view the goal is improvement of organizational efficiency and effectiveness, and the centre of power is the hierarchy. Therefore, measuring the managerial abilities with efficiency criteria is similar to measuring the managerial abilities to achieve the goal of

the organization. The criterion that is defining by Demerjian et al. [22] is one of the most widely used measures of managerial ability in recent years. They introduced their measure based on managers' efficiency, relative to their industry peers, in transforming corporate resources to revenues. The results of some research suggest that capable and intelligent managers can improve CG [21]. Therefore, these hypotheses are raised:

H_3. Managerial abilities moderate the effect of ownership structure on the financial distress likelihood.

H_4. Managerial abilities moderate the effect of audit features on the financial distress likelihood.

2.4 Background and Review of Related Research

2.4.1 Corporate Governance and Financial Distress

Since the collapse of leading companies, the relationship between corporate governance and financial distress has been a topic of great interest of much research [78,81]. Previous studies such as Abdullah [1], Wang & Deng [79], Elloumi & Gueyie [25], Udin et al. [78] study the relationship between corporate governance and financial distress. The results of Luqman et al.'s research [50] on the Pakistan Stock Exchange as an emerging market show that voluntary adoption of corporate governance leads to lower level of financial distress. They also found negative association between director ownership, blockholder ownership, audit committee and financial distress. Li et al. [47] used corporate governance measures, financial ratios and macroeconomic variables for predicting financial distress. Their results demonstrate that in terms of corporate governance, the monitoring of independent directors has significant relationship with the risk of financial distress. Also, state ownership and institutional ownership reduce the risk of financial distress.

Mariano et al. [53] investigated the impact of corporate governance structures on the likelihood of financial distress in U.K. listed companies. The results illuminate that low ownership concentration and low degree of independence increase the likelihood of financial distress. Conversely, larger boards and better director remuneration can reduce financial distress likelihood. Younas et al. [81] examined the impact of corporate governance index (PAKCGI) on firm financial distress for a sample of non-financial firms listed at Pakistan Stock Exchange. The results demonstrate that PAKCGI and institutional ownership have a positive impact on the financial distress. Furthermore, there is a negative relationship between block holders, board size and CEO duality with financial distress. Manzaneque et al. [51] examined the role of institutional shareholders (as owners and board members) in business financial distress likelihood. They considered the diverse set of institutional shareholders' interests, categorized into pressure-resistant and pressure-sensitive. The result indicates that institutional owners insist on directorships when the firm is important for them or when they judge they can keep a firm from going into distress, particularly in the context of concentrated ownership. In contrast, directors appointed by pressure-sensitive shareholders have no impact on the business failure likelihood. Miglani et al. [55] examined the role of voluntary adoption of CG mechanisms in mitigating the financial distress status of Australian firms. They found support for the argument that the adoption of certain CG mechanisms is beneficial for firms, as reflected in a reduced likelihood of financial distress. In particular, greater levels of block holder and director ownership are associated with lower financial distress likelihood.

2.4.2 Managerial Ability and Financial Distress

Leverety and Grace [46] documented that the ability of managers inversely influences the amount of time a firm spends in distress, the likelihood of a firm's failure, and the cost of failure. They conservatively defined managerial ability as the manager's capacity to deploy the firm's resources. Barr & Siems

[10] inserted managerial quality in failure prediction models and showed that the management is very important for success of bank operations. Quality is assessed using DEA, which views a bank as transforming multiple inputs into multiple outputs. Khajavi & GhadirianArani [38] investigated the role of managerial ability in predicting financial distress. The results show that managerial ability improves the performance of financial ratio-based models to predict financial distress.

Mehrani et al. [54] examined the effect of capital market cycle on behavior of financial distress predicting patterns of firms listed in Tehran Stock Exchange. Their findings indicate a positive relationship between the qualified audit opinion and financial distress likelihood in one and two years prior to financial distress and the negative relationship between managerial abilities and financial distress likelihood in the year of financial distress during the recession period. But, the audit opinion and managerial ability have no impact on the financial distress likelihood during the prosperity period.

3 Methodology

This study is an applied research in terms of purpose and a correlation research in terms of method. The statistical population consisted of all companies accepted in the Tehran stock exchange with the following conditions:

- Companies whose fiscal year end date is March 29;
- The companies should not be part of investment companies or financial intermediaries;
- Because managerial ability is calculated for each industry, industries are selected in which the number of remaining companies is at least ten after taking into consideration the above conditions.

Considering the above limitations, 107 companies from six industries including motor vehicles and auto parts, pharmaceutical, cement and plaster, chemical, food industry except sugar and basic metal industry were selected as research sample. We used 2014-2018 data to estimate financial distress and managerial ability models. The data were extracted from Codal and Rahavard Novin software. DEA software utilized to calculate firm efficiency and Eviews and SPSS softwares used for regression analysis. Finally, Smart PLS3 software used to test research hypotheses based on Structural Equation Modeling (SEM) Using 2018 data.

The reason for using SEM is that ownership structure and audit features are latent variables. Statistical techniques are used for variables that are measured directly. In SEM, the presence of latent and observable variables is possible. “Observed variables are represented by data and are usually continuous. A latent variable is a hypothesised and unobserved concept that can only be approximated by observable or measurable variables. Latent variables are expressed in terms of observed variables’ [7]. The appropriate approach of this study is PLS-SEM because when data is not normal and there is a moderating variable in the model, as well as, there is a single-item construct in the model, the use of PLS-SEM seems more appropriate [28]. These conditions are in this research. Janggu et al. [34] used this methodology to investigate the impact of corporate governance on the better sustainability reporting. Another example of the use of SEM-PLS is a study by Bachiller & Garcia-Lacalle [8], which investigated corporate governance in Spanish saving banks and its relationship with financial and social performance. Also, Azim [7] used SEM to examine the impact of corporate governance mechanisms on company performance.

3.1 Conceptual Model of Research

The conceptual model framework of the research is shown in Fig. 1.

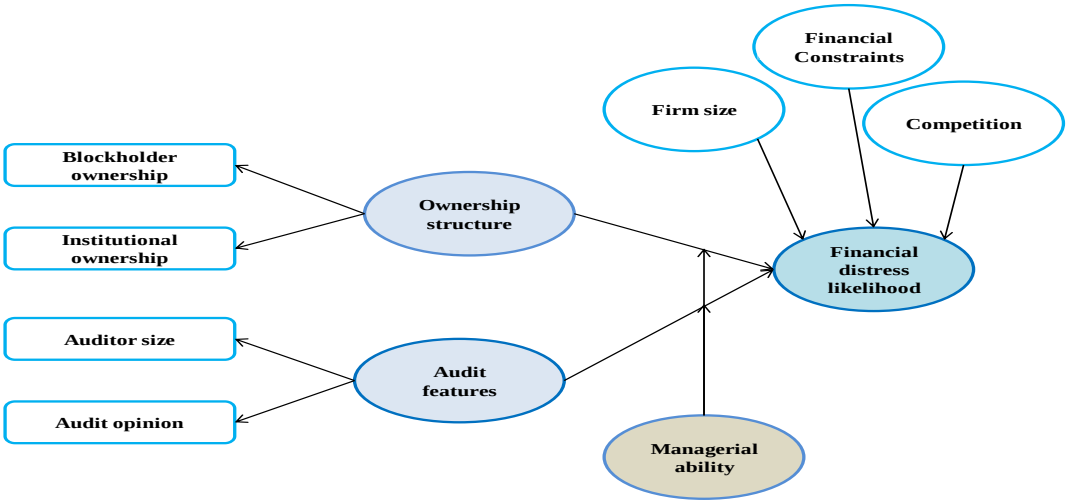

Fig 1: Conceptual Model

3.2 Research Variables

Independent variables**:** The independent variables are the latent variables of the audit features and ownership structure. Their indicators are measured as follows:

- *Block-holder ownership:* It is the ratio of the total shares owned by the block-holders to the total issued shares. Block-holders include shareholders who hold at least 5% of the total issued shares of the company.
- *Institutional ownership:* It is the percentage of ownership of institutional shareholders that is calculated from the ratio of the number of shares owned by the institutional shareholders to the total issued shares.
- *Audit opinion*: It is a dummy and binary coded variable. This is coded as 1 for the unqualified opinion and otherwise (for the qualified opinion) as zero.
- *Auditor size*: It is a dummy and binary coded variable. Auditor size is an indicator of audit quality. If the audit is done by the private sector (Iranian certified public audit firms), this variable will be coded with zero, and if the audit is done by the audit organization, it will be coded with 1.

Dependent variable**:** The dependent variable is the financial distress likelihood of companies. To calculate the probability of financial distress, backward logit analysis has been used. In logit analysis, a non-linear maximum likelihood estimation procedure is used to obtain the estimates of the parameters of the following logit model [9]:

$$P_1(X_i) = 1 / [1 + exp–(B_o+B_1X_{i1}+ B_2X_{i2} +…+B_nX_{in})] = 1 / [1 +exp–(Di)] \quad (1)$$

Where:

$P_1(X_i)$= probability of failure given the vector of attributes *Xi;*

B_j= coefficient of attribute *j* with $j= 1…, n$ and B_0= intercept

X_{ij}= value of the attribute *j* (with $j=1, …, n$) for firm *i*,

D_i = the logit for firm$_i$

The attributes used to estimate the probability of financial distress include a set of variables that financial theory and past research indicate their relationship with financial distress. These variables include:

- EBITTA= $\frac{\text{Earnings before interest \& } taxes}{\text{Total assets}}$ (Altman [5]; Pindado et al. [64]; Mehrani et al. [54] , etc.);
- FETA= $\frac{\text{Financial expenses}}{\text{Total assets}}$ (Pindado et al. [64], etc.);
- RETA= $\frac{\text{Retained earnings}}{Total\ assets}$ (Altman [5]; Pindado et al. [64]; Mehrani et al. [54]; Khodakarimi & Piri [39], etc.);
- TLTA= $\frac{\text{Total liabilities}}{\text{Total assets}}$ (Ohlson [61]; Zemijewski [82]; Tinoco & Wilson [77]; Khodakarimi & Piri [39], etc.),
- CLCA= $\frac{\text{Current liabilities}}{\text{current assets}}$ (Ohlson [61]; Zemijewski [82]; Tinoco & Wilson [77]; Taghavi & Poorali [75], etc.);
- TFOTL= $\frac{Total\ funds\ provided\ by\ oprations}{\text{Total liabilities}}$ (Ohlson [61]; Tinoco & Wilson [77]; Mehrani et al. [54] , etc.)

In many of the research in Iran, Article 141 of the Commercial Code has been used to identify financially distressed companies. Considering the inclusion scope of the financial distress in the theoretical framework of this research, it is not possible to identify all financial distress companies using the legal definition of failure. Many financially distressed firms never file for a bankruptcy [9]. Analysis of UK companies shows a considerable time gap (up to three years or 1.17 years in average) between the period a firm enters a state of financial distress and the date of legal bankruptcy. It is therefore essential that a reliable financial distress prediction model be developed that not only uses the event of bankruptcy, but also includes the time when a company fails to meet its financial obligations [77]. Therefore, companies are classified as financially distressed that:

- According to Sánchez et al. [68], companies who have filed for bankruptcy protection, but have not been liquidation (In this research, companies that are subject to Article 141 of the Commercial Code but are not liquidated)
- According to Pindado et al. [64], Tinoco and Wilson [77] and Manzaneque et al. [52], companies that meets both of the following conditions:
  - Its earnings before interest and taxes depreciation and amortization (EBITDA) is lower than its financial expenses for two consecutive years, leading the firm into a situation in which it cannot generate enough funds from its operational activities to comply with its financial obligations;
  - A fall in its market value occurs between two consecutive periods.

Moderating variables**:** Managerial ability is considered as moderating variable. We use the MA-score criterion developed by Demerjian *et al*. [22] for measuring the managerial ability according to a lot of research (e.g. Lee *et al*. [44]; Chen and Lin [15]). Managerial ability is measured in two stages. In the first stage, using DEA technique, relative efficiency is obtained for each company in the relevant industry. DEA efficiency is defined as the ratio of outputs over inputs. Revenue is the sole output measure and an able management team is what generates the highest level of revenue from a given set of inputs. They consider the following inputs into the revenue production process: Net Property, Plant, and Equipment, Net Operating Leases, Net Research & Development, Purchased Goodwill, Cost of goods sold, Other Intangible Assets, Selling, General, and Administrative. The program is as follows:

$$max_{v,u}\theta = \frac{\sum_{i=1}^{s} u_i y_{ik}}{\sum_{j=1}^{m} v_j x_{jk}} \quad (2)$$

Subject to:

$$\frac{\sum_{i=1}^{s} u_i y_{ik}}{\sum_{j=1}^{m} v_j x_{jk}} \leq 1 \ (k = 1, \dots, n);$$
$$v_1, v_2, \dots, v_{m\geq 0};$$
$$u_1, u_2, \dots, u_{n\geq 0}.$$

Where:

u_i= The weights of output i with i= 1,..., s

v_j= The weights of input j with j= 1,..., m

y_{ik}= The quantities of output i for firm k

xjk= The quantities of input j for firm k

In step 2, Demerjan *et al*. [22] parsed out total firm efficiency into firm efficiency and managerial ability by regressing total firm efficiency on six firm characteristics that affect firm efficiency: firm size, firm market share, cash availability, life cycle, diversification of a firm's operations (operational complexity, and foreign operations). Thus, we estimate the following Tobit regression by industry. The residual from the estimation is managerial ability:

$$Firm\ Efficiency = \alpha + \beta_1 Ln(Total\ Assets)_{it} + \beta_2 Market\ share_{it} + \beta_3 Free\ Cash\ Flow\ Indicator_{it} + \beta_4 Ln(Age)_{it} + \beta_5 Foreign\ Currency\ Indicator_{it} + \epsilon_{it} \quad (3)$$

Control variables**:** control variable are as follows:

- *Financial Constraints (KZ):* The KZ index is a regression model in which the financial constraints are a function of cash flow (CH), dividend payout (DIV), leverage ratio (LEV) and Tobin Q index. Higher KZ means that the company is more dependent on equity and has higher constraints. In order to calculate KZ, the localized Kaplan and Zigales (1997) model by Tehrani and Hesarzadeh (2009) was used:

$$KZ_{index} = 17.33 - 37.487\frac{CH_{i,t}}{TA_{t-1}} - 15.216\frac{DIV_{i,t}}{TA_{i,t}} + 3.394LEV_{i,t} - 1.402Q_{tobin} \quad (4)$$

- *Firm size:* It is obtained from the natural logarithm of a company's stock market value.
- *Competition:* The ratio of company sales to total industry sales is used as an indicator of its competitiveness according to Sepasi et al. [69]. Opler and Titman [62] argue that in firms with financial distress, the decline in firm profitability results from a decline in the company's share of the product market, and such companies gradually lose their competitiveness.

Table 1: Descriptive Statistics

Variable	Max	Min	Mean	Std. Deviation
Managerial ability	0.64	-0.79	-0.0002	0.1920
Financial distress likelihood	1	0	0.1368	0.2529
Firm size	19.61	11.58	14.4257	1.4557
Financial Constraint	1	0	0.4131	0.4928
Competition	0.55	0	0.0288	0.0631
Audit opinion	1	0	0.5028	0.5004
Auditor size	1	0	0.2430	0.4292
Block-holder ownership	1	0	0.7331	0.1821
Institutional ownership	1	0	0.3669	0.3305

4 Research Results

4.1 Descriptive Statistics

Descriptive statistics for the variables are shown in Table 1.

4.2 Fitness of the Research Model

4.2.1 Fitness of the Measurement Model

Table 2 shows the convergent validity and reliability results and Table 3 shows the discriminant validity results of the research measurement models.

Table 2. The Fitness Results of Measurement Models

Constructs	Composite reliability	AVE	Factor loading	
Ownership Structure	0.626	0.522	Block holder ownership	0.43
			Institutional ownership	0.98
Audit features	0.634	0.525	Audit opinion	0.98
			Auditor size	0.72

Table 3. Discriminant Validity Results

Constructs	Financial distress likelihood	Managerial ability	Firm size	Financial Constraint	Competition	Ownership Structure	Audit Characteristics	Managerial ability* Ownership Structure	Managerial ability* Audit Characteristics
Financial distress likelihood	1								
Managerial ability	-0.068	1							
Firm size	-0.21	0.056	1						
Financial Constraint	-0.323	-0.046	0.233	1					
Competition	-0.008	0.006	0.515	-0.058	1				
Ownership Structure	-0.153	0.074	0.392	0.094	0.130	0.722			
Audit Characteristics	0.307	-0.012	0.12	-0.148	0.121	-0.039	0.725		
Managerial ability* Ownership Structure	0.008	-0.041	-0.029	0.055	-0.037	0.037	-0.002	1	
Managerial ability* Audit Characteristics	-0.041	-0.024	0.026	0.019	0.024	-0.001	0.018	-0.247	1

Composite reliability is the measure of internal consistency. Composite reliability values of 0.6 to 0.7 are acceptable [28]. Therefore, both constructs have internal consistency. Factor loads are used to evaluate the representative reliability of the measurement model. The suitable amount of coefficients is 0.4. Considering the values of the factor loadings in the above table, measuring indicators for each construct have the necessary reliability. The average variance extract is a measure of convergent validity. The AVE value of 0.5 or higher indicates that, on average, the construct explains more than half of the variance of the corresponding indicators, and conversely, AVE less than 0.5 indicates that, on average, there is more error in the items than the variance explained by the constructs.

Therefore, both constructs have good convergent validity. It is important to note that the dependent, moderating, and controlling variables are considered as single-item constructs and all of the above table

values are considered one for them. Discriminant validity has been investigated using the Fornell and Larcker criterion. According to the Fornell and Larcker criterion, the square root of the AVE value of each structure must be greater than the highest correlation of the construct with the other constructs in the model. According to table 3, the AVE square root is shown on the diagonal elements and the correlation between the constructs is shown below. Results show discriminant validity for all constructs.

Table 4: Panel A Results without Moderating Variable

Path	Path coefficient	t	Significance levels	p
Firm size → financial distress likelihood	-0.194	3.835	***	0.000
Financial Constraint →financial distress likelihood	-0.216	4.834	***	0.000
Competition →financial distress likelihood	0.051	1.553	NS	0.166
Ownership Structure →financial distress likelihood	-0.053	1.380	NS	0.222
Audit features →financial distress likelihood	0.280	7.951	***	0.000
Panel B. results with moderating variable				
Path	Path coefficient	t	Significance levels	p
Firm size →financial distress likelihood	-0.189	3.556	***	0.000
Financial Constraint →financial distress likelihood	-0.220	5.219	***	0.000
Competition →financial distress likelihood	0.049	1.389	NS	0.166
Ownership Structure →financial distress likelihood	-0.049	1.22	NS	0.222
Audit features →financial distress likelihood	0.279	7.817	***	0.000
Managerial ability →financial distress likelihood	-0.065	1.441	NS	0.150
Managerial ability* Ownership Structure →financial distress likelihood	0.001	0.013	NS	0.989
Managerial ability* Audit features →financial distress likelihood	-0.036	0.755	NS	0.451

*p< .10. **p< .05. ***p< .01 NS: Not significant

4.2.2 Fitness of the Structural Model

In evaluating the results of the structural model, we examine the predictive capabilities of the model and the relationships between the constructs. According to the significance levels and path coefficients, we can discuss the confirmation or rejection of the hypotheses and the type of relationship. The summary of these results is given in Table 4.

Accordingly, the second hypothesis is significant at significance level of 0.05, and the path coefficient (0.279) indicates the positive effect of audit characteristics on the probability of financial distress and therefore the second hypothesis confirmed. However, other hypotheses rejected.

4.3 R^2 and Q^2

R^2 is equal to the second power of the correlation between the actual and predicted values of a given dependent construct and shows the combined effects of independent constructs on dependent construct [28]. Q^2 represents the predictive relevance of the model. The value of Q^2 greater than zero indicates that the model has a predictive relevance for a given dependent construct. In contrast, values equal to zero and lower indicate a lack of predictive relevance.

Values of 0.02, 0.15, and 0.35 indicate that an independent construct has a proportion of small, medium, or large predictive relevance for a given dependent construct. According to the value of Q^2 in Table 5, the model has a higher than medium predictive relevance for the dependent construct.

Table 5. R^2 and Q^2 standard Results

Dependent construct	R^2	R^2_{adj}	Q^2
Financial distress likelihood	0.221	0.206	0.187

5 Discussion and Conclusions

This study examines the impact of corporate governance features including audit features and ownership structure on the financial distress likelihood by considering moderating effect of managerial ability. The study utilize partial least squares structural equations modeling (PLS- SEM) analysis. In SEM, the presence of latent and observable variables is possible. SEM is better in identifying the cause-effect relationship between variables [7]. The findings of the study contribute to the academic literature and policy implications in several ways, as follows:

(1) We found that audit features measured by the audit opinion and auditor size have a positive impact on the financial distress likelihood. The result is consistent with the outcomes of Sikka [72], which shows distressed financial enterprises, whether in the UK, USA, Germany, Iceland, The Netherlands, France or Switzerland, received unqualified audit opinions on their financial statements published immediately prior to the public declaration of financial difficulties. These opinions were provided by one of the Big Four accounting firms. This means that, contrary to popular belief, auditing by the audit organization and obtaining unqualified audit opinion should not be considered as the financial health of the company. This may be related to the audit quality. Therefore, future research could examine the impact of audit features on the financial distress by considering the mediating effect of audit quality using SEM. The results of Hassas Yeganeh & Azinfar [29] in Iran show that there is a negative relationship between the auditor size and the audit quality.

(2) We found that the ownership structure measured by block-holder ownership and institutional ownership does not affect financial distress likelihood. This is consistent with the results of Manzaneque et al. [43] on pressure-sensitive shareholders in Spain, Talebnia et al. [76] and Osmani et al. [63] in Iran. According to David and Kochar [20], there are important barriers such as the relationships of institutional investors with firms, government regulations and information-processing barriers that can limit monitoring effectiveness and reduce the usefulness of institutional ownership. Therefore, creditors and investors are advised to consider that owning a large percentage of the company shares by block-holders and institutional shareholders is not considered as more control of the company for its financial health. Future research could examine the barriers arising from business relationship and the regulatory environment [20] in Iran and their impact on the financial distress.

(3) The effect of managerial ability on the financial distress likelihood and the moderating role of managerial abilities were not confirmed. This is consistent with the results of Mehrani et al. [54] in Iran, which shows that managerial ability has no effect on the financial distress in the period of capital market expansion. To the best of our knowledge, no study has examined the moderating effect of managerial ability, and this research seeks to fill this gap in the literature on managerial ability, corporate governance and financial distress.

(4) Firm size has a negative impact on the financial distress likelihood. Similarly, the effect of financial constraints on the financial distress likelihood was negative. This means that companies with high financial constrains (companies that are more dependent on equity) are less likely to be financially distressed. But competition did not affect financial distress likelihood.

For future research, the model in this study could be expanded to include more corporate governance features such as board characteristics as internal CG mechanism. Future research can also add more indicators to each of the CG features. Given that our statistical sample includes non-financial companies, the proposed model could be examined for financial companies listed on the Tehran Stock Exchange and the results could be compared with non-financial companies. Furthermore, future research can use other criteria to separate audit firms into large and small. One of the limitations of the study is the lack of access to some data on computation of managerial abilities according to Demerjian et al.'s [22] criterion such as goodwill. Separating audit firms into two groups of Iranian certified public audit firms (as small audit firms) and audit organization (as large audit firm) is another limitation. The audit organization may not have all the characteristics of a large auditor. In addition, since the managerial ability is calculated for each industry, some industries were eliminated because the number of companies remaining in them was less than ten after taking into consideration other sample conditions.

Results of backward logit analysis to estimate the financial distress likelihood is depicted in Table 6.

Table 6: Optimal Model

Variable	B	S.E	Wald	Sig.	Exp(B)
C	-0.202	0.788	0.066	0.797	0.817
EBITTA	-27.075	3.702	53.489	0.000	0.000
FETA	30.531	4.363	48.975	0.000	1.8 E +013
RETA	-5.808	1.324	19.231	0.000	0.003
TLTA	-2.028	1.197	2.873	0.090	0.132

The results indicate that EBITTA, FETA, RETA are significant at significance level of 0.05 and TLTA at significance level of 0.01. Thus, the general form of the logit function is as follows:

$$LN\left(\frac{P}{1-P}\right) = -0.202 - 27.075EBITTA + 30.531FETA - 5.808RETA - 2.028TLTA \quad (5)$$

The results of the optimal model obtained from logit regression presented in Table 7. The value of Nagelkerke R^2 is acceptable according to similar research.

Table 7: Model Fitness Indices

Nagelkerke R Square	Cox & Snell R Square	-2 Log likelihood
0.65	0.356	191.049[a]

Discrimination ability of the model, we consider Fig. 2. The area under the curve ranges from one, corresponding to perfect discrimination, to 0.5, corresponding to a model with no discrimination ability. As shown in Fig. 2, the area under the ROC curve in the fitted model is 0.958. Therefore, the model has high discrimination ability between the two groups of healthy and financially distressed firms.

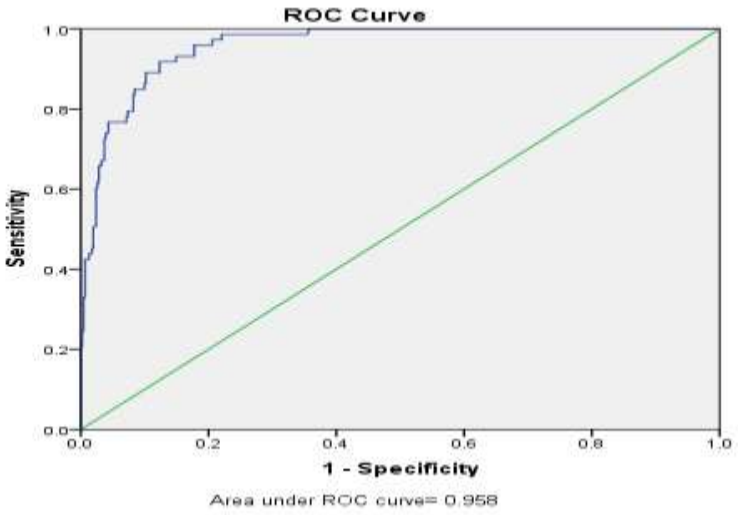

Fig. 2: ROC Curve

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