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Investigating the effect of the characteristics of the board in choosing debt financing mode of the company by evidence from Tehran Stock Exchange

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Abstract

The effect of the characteristics of the board of directors in choosing the debt financing model of the company by evidence from the Tehran Stock Exchange was investigated in this study. The statistical population in this study included all companies active on Tehran Stock Exchange. The method of the present research was applied in terms of purpose and the results can be useful for managers, shareholders, investors, researchers and developers of standards. This research was descriptive exploratory in terms of data analysis and field one in terms of data collection. A statistical sample of 146 companies for an 8-year period (2011-2018) was selected from Tehran Stock Exchange. Findings showed that the significance level of the independent variable (characteristics of the board) at the specified confidence level was significantly related to choosing the debt financing mode of the company; Since the significance level of the independent variable (characteristics of the board) was less than the specified error level.

Keywords: Board Characteristics, Debt Financing, Tehran Stock Exchange
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1 Introduction

Given the growing need for production units, industries, etc. to finance their projects and the inability of banks to meet all these financing needs, there is an urgent need to design new financial instruments. In this regard, Murabaha (cost-plus financing) contract is a sales contract by which the seller informs the customer about the cost price of the goods, including the purchase price, transportation costs, maintenance and other related costs. He then sells it by an extra cost or percentage as profit. Murabaha can be contracted in cash or on credit, and usually, the profit rate on the loan is higher. According to this contract, securities called "Murabaha Securities" have been designed which has its own nature like other legal and economic practices. The board, as one of the most important governance mechanisms, has always been one of the important subjects of study in various fields (law, economics, finance, etc.). In this regard, the performance of this controlling committee has been the centre of discussions and many suggestions have been made to improve its characteristics, including size, the existence of independent members, women's participation, duality, and so on. The board of directors is usually on par with the CEO. The CEO is the highest executive authority of the company and has full power in selecting the executive directors (responsible). Therefore, due to the implicit relationship

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of the executive board members with the CEO, the executive directors may not be able to perform their supervisory duties effectively. By the way, executive managers may abuse their position by controlling salary and benefit schemes and job security. Unlike executive managers, non-executive managers are independent of the company's management and therefore act more effectively in their supervisory role. Hence, from a theoretical point of view, the company's performance is enhanced when the board is independent of a high proportion of non-executive members [9]. Therefore, this study has been designed to provide an analytical framework for the selection of company financing modes, an insight into the multidimensional nature of the company's financing activities and the characteristics of the board. This study investigated the effect of the characteristics of the board in choosing the debt financing model of the company by the evidence of the Tehran Stock Exchange. Therefore, the main question of the study was: Do the characteristics of the board affect the choosing the debt financing model of the company by the evidence from the Tehran Stock Exchange?

2 Literature Review

The last global financial crises emphasize the importance of the time structure of companies' resources for financial stability and remind the developers of law and standards that there is currently no appropriate framework for the temporal matching of resources [10]. Researches show that the end of the company's resources has prepared the pre-crisis background for global financial crises [7].

In a way, most companies use debt in their capital structure. The debt structure is one of the important indices that determine the success of a company and contributes to the sustainable growth of the company [8]. Therefore, decisions focused on the debt structure are important for the company's commercial survival [3]. However, choosing a debt structure is not easy and making the wrong decision can lead to a crisis and bankruptcy. The literature review of the study shows that the relationship between debt structure and corporate value has been studied in many types of research [2]. The structure of the property and debt [4, 5, 11] has also been studied in previous research.

Abdi, Zeinali and Taghizadeh Khaneghah [1], studied the effect of the board characteristics and management entrenchment on the company's diversification strategy. The purpose of this study was to investigate the role of the board characteristics and management bias in the diversification strategy of companies listed on the Tehran Stock Exchange. In this regard, 110 companies were selected from 2008-2014. The panel data method was used to test the research hypotheses. The indices of size and independence of the board have been used to examine the characteristics of the board, and the three indices of the duality of the CEO position, managerial ownership and investment risk have been used to examine the management entrenchment. Also, Herfindahl and entropy indices were used to measure the company diversification. The results show that the size and independence of the board have a positive and negative effect on the diversification of the company, respectively. The results showed that the size and independence of the board had a positive and negative effect on the diversification of the company. This means that the diversification of the company is at a high level in companies with a large board of directors and low independence of the board members. The results also showed that the duality of the CEO and increasing the investment risk had a positive effect on the diversification of the company, while managerial ownership had no effect on the diversification of the company. The results were consistent with the theory of representation; According to this theory, increasing the conflict between shareholders and managers motivates the company's internal managers to perform their opportunistic behaviours in order to diversify the company.

J. Farinha [6] studied the relationship between the characteristics of the board and the type of report of independent auditors of companies listed on the Portuguese Stock Exchange (excluding investment companies and football clubs) using the data of 46 companies over 2012-2014. He showed that among the various characteristics of the board of directors, only the non-executive ratio of the board members, the rate of return on assets, the ownership ratio, the natural logarithm of assets at the end of the year and the operating profit in the current year had a positive and significant relationship accepted by the auditor. Also, the increase in the ratio of market value to book value of equity and the fact that the company was audited by four large international auditing firms, had a negative and significant relationship with the type of report accepted by independent auditors.

3 Methodology

This study aimed to investigate the effect of the characteristics of the board in choosing the debt financing model of the company by evidence from the Tehran Stock Exchange. It was a descriptive study with a practical nature that is done quantitatively; The researcher used the available results in relation to the characteristics of the board and the financing of the company to solve the problem in a specific society (Iran). It was a cross-sectional study in terms of

data collection time because the researcher collected data in a limited period; It was a descriptive-correlational study in terms of the method of data collection because the effect of one variable on other variables was examined.

4 Study Community and Statistical Sample

The statistical population of this research was the companies listed on the Tehran Stock Exchange. The statistical sample included companies that met the following criteria and were selected as a systematic screening.

1. The fiscal year of the selected company should have ended in March to increase comparability.
2. It had not changed activity or a fiscal year from 2011 to 2018.
3. It was not part of financial institutions, investments and banks.
4. The information required by the companies should have been available in the period under review and there should have been no trading interval of more than six months in the mentioned period.

In this study, the sample was selected considering the set constraints. The sample selection steps were as follows.

Table 1: Final sample selection steps

Number of companies	**Final sample selection steps**
338	All companies listed on the stock exchange over 2011-2018
71	Companies including banks, insurance companies, financial intermediaries, investment companies, credit companies and holding companies
76	Companies ended the fiscal year other than March 20th
46	Companies with incomplete data
146	Final sample

5 Data Collection Tools

Regarding data collection tools, taking notes was used for library studies. A data summarization table was used to study the documents. Financial information has been collected from the website of Tehran Stock Exchange Technology Management Company and Rahavard software; It was refined by an Excel program and modelled and analyzed using EViews software.

6 Data Analysis Method

Data analysis of this study was performed using SPSS/23 and EViews software. The mean, standard deviation, kurtosis and skewness were used in the descriptive statistics section. Also, in inferential statistics, t-tests were used for independent groups and multivariate regression to analyze the data. According to the conceptual model and the relationships between variables, the statistical models of the present study are as follows.

Hypothesis Model 1

$$DFR_{i,t} = \alpha_0 + \beta_1 BIND_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 BKNO_{i,t} + \beta_4 BMET_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LEV_{i,t} + \varepsilon_{i,t} \qquad (6.1)$$

7 Model Estimation

7.1 Descriptive Statistics of Research Variables

In this section, data analysis is performed using central indices such as mean and median and dispersion indices of standard deviation, skewness and kurtosis as follows.

Table 2: Descriptive statistics of research variables

variable	mean	median	maximum	minimum	standard deviation	skewness	kurtosis
Debt-based financing	0.163	0.607	30.259	−49.935	6.777	−15.497	30.707
Independence of the board	0.581	0.600	1.000	0.200	0.175	−0.103	3.147
Size of the board	0.034	5.000	7.000	3.000	0.274	6.201	49.819
Knowledge of the board	0.573	1.000	1.000	0.000	0.494	−0.295	1.087
Number of the board meetings	11.028	12.000	50.000	0.000	7.427	−0.011	3.228
Financial leverage	0.549	0.564	0.948	0.012	0.188	−0.383	2.632
Size of the company	14.220	14.062	19.773	10.166	1.551	0.796	4.253

7.2 F (Limer) Test to Choose Panel Data Method

The present study has been estimated using the panel data method in 146 companies listed on the Tehran Stock Exchange. Before estimating the model using panel data, it is necessary to decide on the appropriate method of using such data in estimation. It must first be determined whether there is a need to consider the structure of the data panel (differences or company-specific effects) or whether data from different companies can be pooled and used it in estimating the model. In single equation estimates, the F (Limer) test statistic is used to make the final decision.

H_0: Homogeneity of cross-sections (pool data)

H_1: Heterogeneity of cross-sections (panel data)

According to the results of this test, a decision was made to reject or accept the hypothesis of equality of individual fixed effects of companies and finally to choose the classic method or panel data method. If the probability of the F Limer test WAS less than 5%, panel data WOULD be used, otherwise, the pool data would be used. Table 3 shows the results of the F Limer test.

Table 3: The results of F Limer test

Model	Type of test	Type of model	P-Value	Freedom degree	Statistics value
First model	F Limer test	panel	0.000	144.577	F= 18.571

Given the table above, since the Prob was less than 0.05, the H_0 hypothesis stating the data was pooled, was rejected; Therefore, according to the Limer test, the data was a panel. Now the Hausman test needed to be performed.

7.3 Hausman Test to Select Fixed Effects Model or Random Effects

Once it was found that there was heterogeneity in the cross-sections and individual differences could be considered, the Hausman test was used to determine which method (fixed effects or random effects) was more suitable for estimation (diagnosis of being fixed or random the difference of cross-sectional units). In Hausman's test, the null hypothesis meant that there was no relationship between the error term related to the y-intercept and the explanatory variables, and they were independent of each other; While the opposite hypothesis meant that there was the problem of bias and incompatibility between the error term and the explanatory variables.

$$\begin{cases} H_0: & \alpha = \alpha_s \quad \text{Random effects} \\ H_1: & \alpha \neq \alpha_s \quad \text{Fixed effects} \end{cases}$$

The results of Hausman test for the research model are described in Table 4.

Table 4: Hausman test results

Model	Type of test	Type of model	P-Value	Freedom degree	Statistics value
First model	Hausman test	fixed effects	0.0009	3	χ_2= 16.418

According to the results of the Hausman test for the research model, given that at the 5% confidence level the probability value was less than 0.05, the null hypothesis was rejected. Rejection of the null hypothesis (H_0) indicated that the random effects method was incompatible and the fixed effects method should be used.

Table 5: Results of variance heterogeneity test of research model

Pagan-Cook and Weisberg Method			
Model	**Statistics**	**Probability of statistics**	**result**
First model	183.95	0.000	heteroscedasticity

Given that the P-value listed in Table 5 of the models was less than the significance level of 5%, the models had heteroscedasticity; The generalized least squares (GLS) method was used to solve this problem.

8 Results of Research Hypothesis Test

Research hypothesis

H_0: The characteristics of the board do not have a significant effect on choosing the debt financing mode of the company.

H_1: The characteristics of the board have a significant effect on choosing the debt financing mode of the company.

Model related to research hypothesis:

$$DFR_{i,t} = \alpha_0 + \beta_1 BIND_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 BKNO_{i,t} + \beta_4 BMET_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LEV_{i,t} + \varepsilon_{i,t} \qquad (8.1)$$

The results of model estimation to test the hypothesis were as follows.

Table 6: Summary of statistical results of the first model research test

dependent (debt financing of the company)	**Coifficients**	**Standard deviation**	**Statistics t**	**Significance level**
C (y-intercept)	−1.424	1.108	−1.285	0.198
Size of the board	6.898	2.079	3.318	0.001
Independence of the board	0.052	0.006	8.039	0.000
Knowledge of the board	0.175	0.047	3.688	0.000
Number of the board meetings	0.651	0.016	40.620	0.000
Size of the company	−0.194	0.044	−4.382	0.001
Financial leverage	3.216	0.283	11.330	0.000
AR (1)	−0.129	0.029	−4.335	0.000
Fisher statistic (significance level)	2.351 (0.000)	statistic Durbin-Watson		2.212
coefficient of determination (R^2)	0.891	Adjusted Coefficient Of Determination		0.767

The accuracy of the results should be ensured before testing the research hypothesis based on the obtained results. To do this, the F test was used to evaluate the significance of the whole model. Given the probability of the calculated F statistic (0.000), it can be claimed that the fitted regression model is significant. According to the coefficient of determination of the fitting model, it can be claimed that about 89% of the changes in the dependent variable of the model (debt financing of the company) are explained by independent variables.

The estimation coefficient of variable independence of the board in the table above shows a significant relationship between the independence of the board and debt financing of the company at the error level of 0.05. The calculated p-value for the coefficient of this research variable is less than 0.05. Therefore, there is a significant relationship between the independence of the board and the financing of the company through the debt of the companies listed on the Tehran Stock Exchange.

The estimation coefficient of the variable of the size of the board in the table above shows a significant relationship between the size of the board and the debt financing of the company at the error level of 0.05. The calculated p-value for the coefficient of this research variable is less than 0.05. Therefore, there is a significant relationship between the size of the board and the debt financing of the companies listed on the Tehran Stock Exchange.

The estimation coefficient of the variable of the knowledge of the board in the table above shows a significant relationship between the knowledge of the board and the debt financing of the company at the error level of 0.05. The calculated p-value for the coefficient of this research variable is less than 0.05. Therefore, there is a significant

relationship between the knowledge of the board and the debt financing of the companies listed on the Tehran Stock Exchange.

The estimation coefficient of the variable of the number of the board meetings in the table above shows a significant relationship between the number of the board meetings and the debt financing of the company at the error level of 0.05. The calculated p-value for the coefficient of this research variable is less than 0.05. Therefore, there is a significant relationship between the number of board meetings and the debt financing of the companies listed on the Tehran Stock Exchange.

The estimation coefficient of the variable of the financial leverage in the table above shows a significant relationship between the financial leverage and the debt financing of the company at the error level of 0.05. The calculated p-value for the coefficient of this research variable is less than 0.05. Therefore, there is a significant relationship between the financial leverage and the debt financing of the companies listed on the Tehran Stock Exchange.

9 Conclusions and Recommendations

Capital structure is a combination of debt and equity with which companies finance their assets. Usually, all companies use the source of debt in the composition of their capital structure. The purpose of determining the capital structure is to determine the composition of financial resources to maximize the wealth of the company's shareholders. Changes in shareholder wealth are influenced by various factors, one of which is the composition of the capital structure. If the bond company issues more bonds, its financial capability and degree of financial leverage will increase. If the company achieves a higher rate of return than interest rates on loans, earnings per share will increase. Therefore, financial managers pay attention to the effects and results of applying different methods of financing on the company's risk and return; In this way, they measure the effect of using different compositions of financial structure on the wealth of shareholders. The choice between debt and equity as a new source of financing is influenced by internal and external factors that affect the capital structure of the company.

As mentioned, the capital structure (financing) required to carry out the company's future plans or to reform the company's financial structure can be provided by the debt or equity. Excessive use of equity increases the expected return of shareholders and increases the company's financing costs. On the other hand, excessive use of debt in its short-term or long-term types can increase the company's financial risk and reduce its financial flexibility. In this study, the financial resources provided through debt were examined, which is referred to as financial leverage in the financial field. In other words, financial leverage indicates the amount of debt used in the company's capital structure. As mentioned in previous chapters, the choice of financial resources, especially debt, is influenced by various factors. The purpose of this study was to investigate the effect of the characteristics of the board on the selection of financing modes in companies listed on the Tehran Stock Exchange. To test the research hypothesis, a sample of 146 companies was selected from among the companies listed on the Tehran Stock Exchange from 2011-2018. The data required to calculate the research variables have been extracted from the database called "Rahavard Novin 3" and in cases of incomplete data in these databases, it has been extracted by referring to the financial statements of the mentioned companies. According to the defined hypothesis and the purpose of the research, the general conclusion is as follows.

In the research hypothesis, the influence of the characteristics of the board in choosing the debt financing mode of the companies listed on the Tehran Stock Exchange was examined. Findings showed that the significance level obtained for the independent variable (characteristics of the board) at the level of confidence was significantly related to choosing the debt financing mode of the company; Because the significance level obtained for the independent variable (characteristics of the board) was less than the specified error level. Also, the positive coefficient of estimation of the independent variable (characteristics of the board) showed that there is a positive effect of the characteristics of the board in choosing the debt financing mode of the companies listed on the Tehran Stock Exchange. Findings indicated that the characteristics of the board including board independence, the board size, board knowledge and a number of board meetings considered in this study, have played a positive role in choosing the debt financing model of the company. Today, the board plays a significant role in guiding and advancing the goals of companies. Rising turmoil, instability and uncertainty in the business world in recent years have necessitated the need to form and pay attention to boards more than any other component of corporate governance so that the presence of an inefficient manager is no longer acceptable at the head of the government; Rather, the board, as observers of organizations and companies, is expected to play a role as a reassuring factor in the company's differentiation and survival. Considering the results of the research hypothesis (positive effect of the characteristics of the board in choosing the debt financing mode of the company), since increasing the debt may increase bank interest rates and the inability to meet financial obligations will result in penalties for the company, managers are advised to choose the level of debt according to financial needs and investment opportunities. The results also showed that the size of companies has a negative

effect on the choosing the debt financing model of the company. Therefore, it is recommended that creditors do not consider the size of the company as a criterion for granting facilities; They can consider components such as financial performance, company value, etc. as criteria for granting financial facilities to companies. Because the ability to fulfil financial obligations in these companies is greater.

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