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The Impact of Top Executives Overconfidence on Financial Distress

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ABSTRACT

Background: Overconfident managers due to their excessive optimism, invest in some projects with negative net present value. Therefore, failure to obtain the expected cash flows can make them incapable of fulfilling the payment obligations on debt and the firm may encounter financial distress. This paper investigates the effect of top executives' overconfidence on financial distress. For this purpose, a sample of 103 companies listed on Tehran stock exchange for time period of 2008 to 2012 is selected. To evaluate the research hypotheses, logistic regression model and independent samples t-test have been conducted. The results of this study show that the financial distress of companies which their managers have more overconfidence is significantly more than companies which their executives are not overconfident. Results also show that managerial overconfidence has a significant impact on financial distress.

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INTRODUCTION

One of the most important tasks of top executives in any organization is investment decision. A wrong doing in this area imposes a huge cost to the company. If firm invest large sums (overinvestment) consequently its costs will increase and in bad economic situation cause large losses and even bankruptcy of the company. In recent years, studies have been conducted which acknowledge that managers are not always fully rational and those who have high self-confidence are very optimistic about their decisions results especially in investment decisions [1] and due to excessive optimism and overconfidence may make irrational decisions that have significant impact on company financial activities [2]. Some studies show that behavioral factors such as overconfidence of top executives are effective on inefficiency of investments and can lead to wastage of resources [3,4,5]. According to Heaton overconfident managers may invest company's internal cash flows in projects with negative net present value that may cause the company's internal resources wastage and consequently financial distress [3]. Given the importance of financial distress and its effects on bankruptcy of companies many studies have been conducted aiming to predict financial distress and bankruptcy. However, few studies have examined the reasons or causes of financial distress and bankruptcy. In this regard the present study examines the impact of top executives overconfidence on financial distress of companies listed on Tehran stock exchange.

Literature Review:

Financial distress is a term used in general to indicate a condition when promises of a business entity to creditors are broken or honored with difficulty [6]. According to Chan and Chen companies that experience financial distress due to poor operational performance lose their market value and suffer from high debts problems and lack of liquidity [7]. Financial distress may be temporary to a firm, but if the financial status of the firm cannot be improved, then financial distress will eventually lead the questioned firm to bankruptcy [6]. Financial distress of companies does not always lead to bankruptcy, but without exception all firms before bankruptcy experience financial distress [6]. Bankruptcy of economic entities can result in huge loss to the micro and macro levels. In macro level the financial distress causes reducing gross domestic product (GDP), increasing unemployment, wastage of country resources and etc. In micro level, businesses such as shareholders, potential investors, creditors, managers, employees, suppliers and customers lose and considerable

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damages can be applied to these groups [8]. Therefore, identify factors affecting the financial distress can be helpful in its prediction and early diagnosis and also preventing from its damages. Determining of exact reason or reasons of bankruptcy and financial problems is not an easy task. In most cases, several reasons lead to the bankruptcy phenomenon. According to Saeidi and Aghaei firms with low profitability, high debt and less liquidity are more likely to be in financial distress [9]. Newton believes that the main reason of bankruptcy is economic and financial problems [10], while Gitman and Whitaker believe that first and foremost reason of organizations bankruptcy is their mismanagement [11, 12]. Top executives of each organization who their decisions impact on life and success of the organization, are also influenced by internal and personality factors and their behavior in this respect is in the area of behavioral finance issues. In this regard one of the most serious issues that impact on investment decisions of organizations managers is overconfidence of top executives [12]. All managers, do not act the same way and like other people have their own individual differences, talents, motivations and desires and also have different attitudes, knowledge and value systems. Although these differences may appear to be minor but when pass through the cognitive mediating processes of individuals lead to very large differences and quite different behavioral results. Such differences mainly originate from differences arising from the character of each individual [13]. A review of psychological studies show that top executives in their decisions are even more prone to irrational decisions than others [14] and managers with overconfidence are often very optimistic about their decisions and their results especially in the context of investment decisions [1]. Managers who have overconfidence may act in a manner that decreases the company's value and encounter with risk [15,16]. Because managers who are overconfident are prone to exaggerate and overestimate their abilities and performance but on the other hand, underestimate probability and amount of financial distress costs [17]. Studies carried out in the field of investment management decisions show that personality characteristics of managers especially their overconfidence lead to abnormal investment decisions and increase the sensitivity of investment-free cash flows [16]. According to studies, internal financing resources of company are of the cases that can impact on the company investment amount [4,5]. The dependence of a company on internal resources determines through the "investment sensitivity-free cash flow" of that company. As the investment sensitivity-free cash flows are higher the probability of investment inefficiency increases [18,4,5].

Investment inefficiency also means ignoring investment opportunities with positive net present value (low investment) and choosing projects with negative net present value (overinvestment) [19]. Overconfident managers due to excessive optimism may incorrectly predict free cash flows obtained from the projects very favorable and as a result value many projects above their intrinsic value. On the other hand, these managers believe that the market value their company less than the intrinsic value and makes external finance costly. Thus, if the company has internal resources, overconfident managers may show more willing to overinvestment [16]. Overinvestment maximizes personal interests of managers but reduces the company value [20]. Because if managers overinvest with the company internal resources it's possible that required free cash flows to fulfill obligations and pay debts not provided at right time and the company may encounter financial distress. In other words, overconfidence causes managers consider the occurrence probability of desirable condition exaggerative and with irrational actions increase the probability of the company’s bankruptcy [21].

Koch investigated the relationship between financial distress and earnings forecasts accuracy by managers [22]. The results of his study showed that managers of companies with financial distress tend to predict the future earnings of company higher than the actual amount and in other words, predict optimistic. Hribar and Yang showed that predicted earnings by overconfident managers are more optimistic than predicted earnings by other managers [23]. Therefore, it is expected that companies with financial distress which predict their future earnings optimistically have overconfident managers. Lin and *et al* also used predicted earnings by managers as a benchmark for measuring overconfidence of top executives [24]. If the number of times that managers predict earnings more than reality is more than the number that predict earnings less than reality, they identify as overconfident managers. If managers are overconfident the company's future earnings will be predicted above the real earnings level [24]. In the study of Lin and *et al* in addition to the predicted earnings criteria the manager investment portfolio criteria is also used to measure overconfidence. Using both criteria the same results were obtained. Kramer and Liao in a study using overconfidence measurement criteria of Malmendier and Tate investigated the impact of managers' overconfidence on analysts view [25, 15,16]. The results of this study showed that analysts predict earnings of companies that have overconfident managers optimistically. Thus, the number of times that the company net earning is predicted higher than the actual amount is more than the number of times that earning is predicted less than the actual amount.

Hu and Chang in a study directly investigated the relationship between overconfidence of managers and financial distress [26]. In this study the criteria of Malmendier and Tate is used in order to measure overconfidence of managers. The results of this study indicate that overconfidence of top executives has direct and significant impact on financial distress of companies. But, based on the results of this study, overconfidence of managers who are mentioned in the Wall Street Journal has had opposite effect on financial distress of companies.

Research Hypotheses:

To investigate the relationship between financial distress and confidence of top executives, two hypotheses are stated as follows.

1: The financial distress of companies which have managers with overconfidence is significantly more than companies which their managers are not overconfident.

2: Overconfidence of top executives has direct and significant impact on financial distress of companies.

Research Method:

The population of this research consists of companies listed on Tehran stock exchange for the time period of 2008-2012. a sample of 103 companies are selected using systematic elimination methods by considering the following criteria:

1. Year end of all sample companies should be 20th March (Iranian fiscal year of most companies).
2. In order to have homogeneous data the sample companies should only include manufacturing companies.
3. Their stock trading is not halted more than six months during the study period.
4. Sample companies' financial data for statistical analysis should be accessible.

To test the first hypothesis, independent samples t-test is used. Thus, mean of financial distress score, of companies that have overconfident managers is compared with financial distress mean score of companies that their managers are not overconfident. To test the second hypothesis according to Hu and Chang, the logistic regression method is used [26]. The model that is used to test the second hypothesis is Equation 1 as follows:

$$\text{Distress}=\alpha+\beta_1\text{Confidence}+\beta_2\text{Size}+\beta_3\text{Top1}+\beta_4\text{ROA}+\beta_5\text{Futl}$$

Where:

Distress = Dummy variable to determine financial distress of companies (The calculation method is explained)

Confidence = Criteria to measure overconfidence of managers that calculate by difference of manager predicted annual earning and actual earning. If during research period the number of times that manager predicts earnings higher than reality is more than the number of times that predicts less than reality, the manager is overconfident and the Confidence variable takes the value of one and otherwise zero value for this variable be considered [27,24,28,29,4].

Size = Is company size that is calculated through the total stock market value.

Top1 = Percent of a share that belongs to the largest shareholder.

ROA = The return rate of assets that is calculated by dividing net earnings by total assets.

Futl = Performance of company that is calculated through cash flows obtained from operations divided by the total debt.

According to Monti and Garcia in this study for calculating companies financial distress a model is presented using Principal Component Analysis method and logistic regression [30]. According to the planar nature of the dependent variable in the logistic regression model, a sample consists of two groups of bankrupt companies and companies with financial health condition is considered. The bankrupt companies are selected by considering the following restrictions, according to Pourheydari and Koopaei [8].

1. Being subject to Article 141 of the Commercial Code (accumulated losses exceeding 50% of capital).
2. Debt to total assets ratio should be greater than one.
3. Company should have net loss.

To select independent variables in the logistic regression model, with review of studies in the field of financial distress and bankruptcy, 20 influential variables were selected; these variables are described in Table 1.

Table 1: Influential variable on financial distress of companies.

X1: EBIT to Assets	X2: Net Income to Assets
X3: Net Income to Sales	X4: Retained earnings to Assets
X5: EBIT to Sales	X6: Current Assets to Short-term Debts
X7: Net Sales to Assets	X8: Net Sales to fixed Assets
X9: Total Debts to Assets	X10: EBIT to Interest expenses
X11: Working Capital to Assets	X12: Working Capital to Long-term Debts
X13: Working Capital to Sales	X14: Operating Cash flow minus Net income to sales
X15: Operating Cash flow to sales	X16: Operating Cash flow to Debts
X17: Operating Cash flow to Equity	X18: Equity to Debts
X19: Equity to Capital	X20: logarithm of total assets

After collecting the required data and calculate 20 variables shown in the table 1, significant differences of the variables between the two groups of bankrupt and healthy observations were evaluated using independent samples t-test.

After determining influential variables on bankruptcy of companies the principal component analysis method was used for reducing the dimension of independent variables. Finally, using components derived from principal components analysis in the logistic regression, the model shown in equation (2) is presented to measure financial distress of companies. Using this relationship, the company's bankruptcy probability (a

number between zero and one) calculated. As the bankruptcy probability of a company is higher its financial distress is also more.

$$p(y=1)=\frac{e^{9.068-1.789(PC1)}}{1+e^{9.068-1.789(PC1)}} \quad (2)$$

Where:

p(y=1) = The bankruptcy probability of company, e: Constant 2.7182, PC1 = The principal component that calculates using Equation (3)

$$PC1=0.908X1+0.678X2+0.782X6+0.884X16+0.919X18+0.656X19+0.616X20 \quad (3)$$

After calculating all of the required variables for testing hypothesis and estimation of the logistic model shown in Equation 2, first all companies are sorted based on the amount of financial distress from large to small and number 1 is assigned to 30% of companies which have the highest level of financial distress and number 0 is assigned to 30% of companies which have the highest level of financial health. Thus, the Distress planar variable is calculated. SPSS and E-views software have been used to perform required statistical trials.

Research Findings:

To investigate the possible relationships between variables, the correlation between the variables is measured and shown in Table 2.

Table 2: Correlation between the research variables.

	Distress	Confidence	Size	Top	ROA	Futl
Distress	1					
Confidence	0.401**	1				
Size	-0.322**	-0.025	1			
Top	-0.024	0.022	-0.028	1		
ROA	-0.64**	-0.262**	0.212**	0.129**	1	
Futl	-0.459**	-0.157**	0.119**	0.076	0.597**	1

As is shown, correlation between Confidence and Distress variables is calculated positive and significant. Thus, a direct relationship identifies between financial distress and overconfidence of top executives. Also, three variables of ROA, Size and Futl have a negative and significant correlation with Distress variable that reflects the inverse relationship of company size and performance with financial distress.

Results of first research hypothesis test, comparing the financial distress of companies with overconfident managers and companies without overconfident managers, using independent samples t-tests are shown in Table 3.

Table 3: Results of Mean comparison test.

	With Overconfidence	Without Overconfidence	Averages Difference	t-statics	Probability
Financial Distress	0.0115	0.00002	0.01148	2.21	0.045

As shown in Table 3 the financial distress Mean of companies which their managers are overconfident is much higher than companies without overconfident managers. Also, the t-statistics and calculated probability indicate significant difference between the calculated Means. Thus, the first research hypothesis is accepted.

The second research hypothesis states that overconfidence of top executives has direct and significant impact on financial distress of companies. This hypothesis is tested by Equation model 1. The model estimation results are provided in Table 4. According to Table 4, LR statistics probability is less than 5% , that indicates this model is significant at 95% confidence level and has high reliability. Mac Faden statistics show that about 62% of the variability is justifiable by the explanatory variables. In order to evaluate the estimated model fitting the Hosmer-Lemeshow test is used considering that statistic probability of the Hosmer-Lemeshow test is equal to 0.233 and is greater than 5%, which shows that, the estimated model is good fit. The Confidence variable coefficient is calculated equal to 1.146. The probability of estimated coefficient is calculated less that 5% thus, the calculated coefficient is significant at confidence level of 95%. In other words, overconfidence of top executives has increased the probability of company's financial distress. Thus, the second research hypothesis is also approved. According to Table 4, coefficients of ROA, Size and Futl variables are calculated negative and significant at confidence level of 95%. In other words, the aforementioned variables have adverse and significant effect on financial distress of companies and if companies have larger size and better performance will less encounter with financial distress.

Table 4: Results of the second hypothesis test.

Variable Symbol	Estimated Coefficient	Standard Error	Z-statistics	P-Value
C	1.8226	0.5666	3.2167	0.0013
Confidence	1.1461	0.4010	2.8577	0.0043
Size	-0.0001	0.0000	-5.4121	0.0000

Top	0.0292	0.0102	2.8577	0.0043
ROA	-16.9075	2.7805	-6.0807	0.0000
Futl	-4.8109	1.3261	-3.6278	0.0003
McFadden R-squared	0.6248			
LR statistic	295.3880			
Prob(LR statistic)	0.0000			

Conclusion:

The purpose of this study is evaluating the impact of top executives' overconfidence on financial distress. The results of Mean comparison test show significant difference of financial distress between companies having overconfident managers with companies not having overconfident managers. Logistic regression results also confirm a direct impact of top executives' overconfidence on the financial distress of companies that in the study of Hu and Chang was demonstrated [26]. Because overconfident managers may overinvest internal funds of company [4, 15] and waste available resources of company and increase the probability of company financial distress [3]. The results of this study also indicate that firm size has an inverse relationship financial distress. It seems that larger firms with greater assets and financial resources have greater ability to deal with financial distress and bankruptcy. Also, adverse effects of assets return variables and the ratio of free cash flows to debts with financial distress indicate that companies with higher performance have greater ability to fulfill their obligations and will be less affected by financial distress. Based on the results of this study, as the percentage of shares of shareholders is greater the probability of financial distress of companies is also increasing.

Research Suggestions:

According to the direct impact of top executives' overconfidence on financial distress of companies it recommends to managers in case of positive deviation of the predicted earnings in subsequent periods, revise their earnings prediction procedure and their financing decisions. Also, for future studies, the following items are suggested:

- In this research overconfidence of top executives is measured using deviation of predicted interests from actual interests. Therefore, it's recommended in future studies, possibly using different criteria to calculate this variable.
- The hypothesis of this research is investigated based on the data of all the sample member companies. It will be good idea to conduct the same study at industries level.
- For future studies it is recommended that the impact of other financial variables such as debt amount and variables that reflect macro economic and political conditions on financial distress also be examined.

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