



The relationship between CEO's Overconfidence and Cost of Equity Capital

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Abstract: *One of the important characteristics of a managers' personality is overconfidence. Managers are optimistic of their business unit earnings and cash flows and have a positive outlook on future risks and returns. This research examined Investors' perceptions of CEO's overconfidence as an evidence of costs of equity capital. Investors can perceive CEO overconfidence as a positive or negative attribute that negatively signals business risk and information leading to inappropriate investment decisions and positively reducing business risk and It is information that is beneficial to the company and such managers tend to invest in risky and innovative projects. To conduct this research, data of a five-year period was used to achieve the goals. The research time domain was during 2011-2015. Eviews software was used to estimate the statistics. Studies show that in Iran, despite the positive relationship between overconfidence and cost of equity, there is no significant relationship, and there is no linear and nonlinear relationship between overconfidence and cost of equity. There is information asymmetry in the Iranian capital market. That leads to poor reporting. In other words, the poor quality of reporting and the almost equal rate of financing costs of all securities companies make CEO's overconfidence not affected by equity costs.*

Key words: *CEO overconfidence, Capital cost, Equity, Investors' perception*

INTRODUCTION

Investors may perceive CEO overconfidence as a positive or negative feature. On the one hand, CEO overconfidence can negatively be considered a sign of business risk and information risk (Agazadeh et al., 2018). The findings of some empirical studies show that CEO's overconfidence leads to inappropriate financing and investment decisions. For example, Malmandreir and Tate 3 (2005) found that overconfident managers tend to over-invest when internal financial resources are available and that projects with positive net present value should be financed by external funding. They refuse. This causes investors to perceive higher business risk and therefore increase equity capital. Sherand and Zachman 4 (2012) showed that overconfidence of the CEO leads to a decrease in the quality of financial reporting. The lower the quality of financial reporting, the greater the information risk (Lambert et al., 2007). From this perspective, if investors perceive CEO overconfidence as a sign of increased business and information risk, it is predicted that there will be a positive relationship between CEO's overconfidence and cost of equity capital. (Aghazadeh et al., 2018).

On the other hand, investors may have a positive view of the CEO's overconfidence, which leads to reduced business and information risk. The findings of some studies suggest that CEO overconfidence may be valuable to the company because such managers tend to undertake risky or innovative projects

(Hershelifer et al., 2012). CEO overconfidence is positively associated with R&D costs (Galasso and Simco, 2011). Investors perceive the increase in innovation as a sign of risk reduction and thereby reduce equity cost (Aghazadeh et al., 2018). Managers with overconfidence also provide more accurate and optimistic earnings forecasts (Haribar and Young, 2016; Libya and Renkamp, 6, 2012). This leads to a reduction in information risk, according to investors. From this perspective, if investors perceive CEO overconfidence as a sign of reduced business and information risk, it is predicted that there will be an inverse relationship between CEO overconfidence and cost of equity capital. (Aghazadeh et al., 2018).

Literature Review

Schrand and Zechman (2012) found a positive relationship between management overconfidence and the possibility of fraud in financial statements, and the higher internal and external monitoring through the governance mechanisms did not reduce this effect. Aghazadeh et al. (2018) investigated the effect of CEO's overconfidence on the cost of equity capital. The results of this study showed that the relationship between the CEO's overconfidence and the cost of equity capital is non-linear, meaning that the moderate level of CEO's overconfidence leads to the lowest cost of equity capital.

Mangena et al. (2013) conducted a study called ambiguity about the effect of company disclosure on equity costs. To this end, they surveyed 125 companies. Their results showed that there was a negative relationship between compulsory disclosure and equity cost.

Heshmach et al. (2013) concluded that managers are overconfident because they consider external financing to be costly in order to invest in the company, with little cash benefit if needed in the future. They divide more. They also found that in companies with lower growth opportunities and lower cash flows, this negative relationship is stronger.

Hughes et al. (2009), in a study, investigated the relationship between the concept of cost of ownership and expected return. They showed that the concept of equity cost differs from expected returns and on average there is a correlation between expected returns and cash flow, cash flow growth, and financial leverage. The results indicated the relationship between equity cost and market risk, the relationship between cost of capital, growth, financial leverage and risk, predicting future returns and characteristics of corporate information environment.

Barf et al (2009) examined the relationship between Transparency in profit and equity cost. The researchers used Fama and French's three-factor model to calculate equity costs along with another factor called the "Trend Factor 8". The researchers' findings suggest that there is a significant negative relationship between Transparency in profit and equity costs and that companies with more Transparency in profit experience lower capital costs.

(Asghari Kansari, 2015) examined the relationship between management optimism and the abnormal returns of manufacturing companies listed on the Tehran Stock Exchange. The sample includes 104 companies listed in Tehran Stock Exchange. Findings from linear regression analysis indicate that firms with optimistic managers earn more abnormal returns than other firms.

Kazemi Noori (2012) concluded in his dissertation that when the company faces constraints in external financing, the issue of investment sensitivity to domestic cash flows is raised and the efficiency of investment decisions becomes more important.

Methodology

The present study was a correlational type of study. The present study was an applied research in terms of its objective. This correlational study was a post-hoc study using the past information. To conduct this research, data of a five-year period were used to achieve the goals. The time domain of the research was 2011-2015. In this research, knockout sampling method was used. In order to test the research hypotheses, the following regression model was used:

$$CEC = \beta_0 + \beta_1 OC + \beta_2 OC^2 + \beta_3 SIZE + \beta_4 MTB + \beta_5 LEV + \beta_6 EGROWTH + \beta_7 OCF + \beta_8 Z - Score + e$$

It should be noted that for testing the first hypothesis, the regression coefficient β_1 was used for evaluating the linear relationship between CEO overconfidence (OC) cost of equity capital (CEC). Moreover, to test the second hypothesis, the coefficient β_2 was used for evaluating the second degree relationship between overconfidence (OC2) and cost of equity capital (CEC).

After collecting data, Rahvard-e Nowin software was used. For this purpose, the extracted data were first entered into Excel software and after initial analysis, they were entered to the statistical software. Eviews software was used for statistical estimations. In this study, descriptive statistics including frequency distribution table, percentage of frequency, and frequency distribution chart were used for data analysis.

Research objectives

The general objectives of this research were as follows:

The general objective of this research was to investigate the effect of CEO overconfidence on the cost of equity capital in Tehran Stock Exchange.

Specific objectives of research

1. Investigating the linear relationship between the cost of equity capital and CEO's overconfidence
2. Investigating the second degree relationship between the cost of equity capital and CEO's overconfidence

Research questions

1. Is there a significant linear relationship between the CEO's overconfidence and the cost of equity capital?
2. Is there a significant second degree relationship between the CEO's overconfidence and the cost of equity capital?

Results

Investigating the descriptive statistics of the variables at the general level of companies

To describe the statistical indices of the collected data, descriptive indices of mean, median, maximum, minimum and standard deviation were used. According to the information presented in Table 1, the cost of equity had the highest standard deviation and the operating cash flow ratio had the lowest standard deviation.

Table 1: Descriptive statistics

	Cost of equity capital	Overconfidence	Overconfidence	squared Overconfidence	size	Investment opportunity	Debt ratio	Operational cash ratio	Altman's z score
mean	522.20	359.0	029.0	085.03	062.6	096.2	582.0	114.0	053.1
median	929.20	0	012.0	030.0	023.6	877.1	584.0	101.0	044.1
max	229.23	1	886.0	785.0	731.7	199.14	044.1	507.0	890.1
min	346.17	0	739.-0	0	847.4	001.0	065.0	-155.-0	101.0
SD	719.1	480.0	290.0	139.0	447.0	225.1	186.0	101.0	409.0

Investigating the reliability of research variables

In order to examine the reliability of variables in the panel data, a single root test was used. According to the results presented in Table 2, the significance level of all variables was less than 0.05, so all variables were reliable.

Table 2: Levin, Lin and Chu single-root tests

variable	Coefficient	Significance level
Cost of equity capital	167.-37	000.0
Overconfidence	233.-6	000.0
Overconfidence	830.-24	000.0
Squared overconfidence	514.32	000.0
Size	927.-26	000.0
Ratio of market value to book value of equity	216.-21	000.0
Debt ratio	687.-8	000.0
Operational cash ratio	677.-8	000.0
Altman's z score	353.-17	000.0

Investigating the assumptions of linear regression model

The lack of autocorrelation of the error term

If the value of the Durbin-Watson statistic was greater than 2.500, the error term would have a negative autocorrelation, and if it was less than 1.500, the error terms would have a positive autocorrelation, and best condition would be the time when Durbin- Watson statistic value was 2.000. In the present study, in order to ensure the independence of the model error terms relative to each other, Durban Watson statistic was considered.

The lack of correlation between explanatory terms

The results of the correlation test between variables of the first and second hypotheses have been presented in Table 3. As none of the elements of matrices presented in Table 3 were greater than 0.70, the variables used in this hypothesis were not correlated.

Table 3: Correlation test of the first hypothesis

	Capital cost	size	Growth opportunity	Debt ratio	Operational cash flow ratio	Altman's z score
Capital cost	1					
size	209.0	1				
Growth opportunity	062.0	-050.0	1			
Debt ratio	-153.0	035.0	144.0	1		
Operational cash flow ratio	146.0	070.0	108.0	-403.0	1	
Altman's z score	-215.0	-236.0	143.0	-288.0	306.0	1

Table 4 shows the results of the correlation test for the second hypothesis. As none of the elements of matrix was greater than 0.7, there was no correlation between the variables.

Table 4: Correlation test of the second hypothesis

	overconfidence	Squared overconfidence	size	Growth opportunity	Debt ratio	Operational cash flow ratio	Altman's z score
overconfidence	1						
Squared overconfidence	311.0	1					
size	047.0	-063.0	1				
Growth opportunity	010.0	-037.0	-048.0	1			
Debt ratio	-103.0	-038.0	031.0	149.0	1		
Operational cash flow ratio	038.0	-024.0	088.0	104.0	-402.0	1	

Altman's z score	126.0	059.0	-227.0	141.0	-278.0	307.0	1
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The lack of collinearity between explanatory terms

If the VIF test statistic was approximate to 1, it would indicate a lack of collinearity. As an empirical rule, if the VIF value was greater than 5, it would indicate high multi-collinearity. As the VIF index was less than 5, there was no collinearity problem between the variables. The results of the collinearity of the variables of the research have been presented in Tables 6 and 7.

Testing the research hypotheses

Considering the significance level of the F-Limmer test of the first and second hypotheses (0.001 and 0.000, respectively), the data was of panel type. In order to choose one of the fixed or random effect models, Hausman test was used. If the significance level of this test was more than 0.05, random effect model was used, but if it was less than 0.05, the fixed effect model was used. Therefore, given what was stated and the coefficient and significance level of the Hausman test for the first and second hypotheses (114.657, 0.000, and 120.472, and 0.000, respectively) and as the level of significance was less than 0.05, the type of model used to test the hypotheses was panel data model with fixed effects.

Table 5: Testing the research hypotheses

hypothesis	F-Limmer		Hausman	
	Coefficient	Significance level	Coefficient	Significance level
Hypothesis 1	674.1	001.0	657.114	000.0
Hypothesis 2	792.1	000.0	472.120	000.0

Hausman and F-Limmer test

In order to examine the confirmation or rejection of the estimate model, its F value and significance value should be obtained. Their values have been shown in Table 6 and as they were 1.865 and 0.00, respectively, and the F significance level was less than 0.05, the used model was accepted at the confidence level of 0.90. The Durbin-Watson statistic was 2.432, so there was no auto-correlation between the error terms of model. The coefficient of determination and the adjusted coefficient of determination were 0.411 and 0.190, respectively. Hence, using independent and control variables used in the research, 1.90% of the dependent variable behavior could be predicted using the independent and control variables of the research. The results presented with regard to the variables showed that the overconfidence of managers had a coefficient and significance level of 0.2424 and 0.111, respectively, so it did not have a significant relationship with the cost of equity. Considering the control variables, there was a positive and significant relationship between Altman's z score and size and capital cost.

The VIF index for all independent control variables was less than 5, so there was no collinearity problem among the research variables.

Table 6: Estimation of the first hypothesis's model

Variable	Coefficient t	SD	Statistic t	Significance level	Collinearity
Fixed coefficient	-151.30	766.4	326.-6	000.0	
Overconfidence	224.0	272.0	823.0	411.0	111.1
size	689.7	734.0	475.10	000.0	129.1
Growth opportunity	-045.0	101.0	-443.0	657.0	066.1
Debt ratio	211.2	340.1	649.1	100.0	282.1
Operating cash flow ratio	105.0	632.1	064.0	948.0	137.1
Altman's z score	585.2	453.0	700.5	000.0	296.1
Coefficient of determination	411.0				
adjusted coefficient of determination	190.0				
F statistic	865.1				
Significance level- F statistic	000.0		Durbin-Watson	432.2	

The coefficient and significance level of the F statistic were 3.391 and 0.00, respectively. Therefore, the model used to estimate the second hypothesis was accepted at a confidence level of 90%. The Durbin-Watson statistic was 2,420, so it was within a range of 1.5 to 2.5 and the error terms of model had no autocorrelation problem.

The coefficient of determination and the adjusted coefficient of determination were 0.44 and 0.23, respectively. Therefore, the independent and control variables used in the model explained 2.3% of the behavior of the dependent variable. The coefficient and significance level of overconfidence were 0.741 and 0.004, respectively. Therefore, there was a positive and significant relationship between overconfidence of managers and the cost of equity. It means that as managers had higher overconfidence, cost of equity would be higher, and vice versa. The results of the control variables indicated that the Altman's z score and the size had a positive and significant relationship with cost of capital. As the VIF index for independent and control variables was less than 5, there was no collinearity problem among the research variables.

Table 7: Estimation of the second hypothesis's model

variable	Coefficient	SD	t-statistic	Significance level	Collinearity
Fixed coefficient	938.-29	792.4	246.-6	00.00	
overconfidence	741.0	361.0	050.2	004.0	289.1
Squared overconfidence	1.2869	772.0	665.1	097.0	202.1
size	796.7	0726	728.10	000.0	151.1
Growth opportunity	-086.0	100.0	-864.0	388.0	083.1
Debt ratio	515.1	287.1	176.1	240.0	239.1
Operational cash flow ratio	-262.0	611.1	-162.0	870.0	143.1
Altman's z score	273.2	458.0	959.4	000.0	358.1
Coefficient of determination	446.0				
adjusted coefficient of determination	233.0				
F-statistic	091.2	Durbin-Watson		420.2	
Significance level(F-statistic)	000.0				

Discussion and Conclusion

Usually in the economy and especially in investment it is assumed that investors act rationally. Reasonable investors prefer certainty to uncertainty, and it is natural that in this case investors can be reluctant to take risks, and will demand higher return on managers for higher certainty, leading to higher payroll costs. Owners of shares. The objective of the first hypothesis was to investigate the linear relationship between manager's overconfidence and cost of equity capital. In order to determine the overconfidence, Duellman et al model (2015) was used and in order to examine the cost of equity, God and Muhanram criterion (2003) was used. The results of the first hypothesis test suggested that although there was a positive relationship between the two variables of overconfidence, the cost of equity, the partial coefficient of regression indicating the independent variable slope with regard to dependent variable, was not significant. Therefore, the hypothesis of the research was not confirmed. The objective of the second hypothesis was to investigate the second degree relationship between COE'S overconfidence and cost of equity. In the second hypothesis, in order to determine the overconfidence, the model used by Biddle et al (2009) was utilized, which was a function of changes in total assets of the current year compared to the previous year as well as changes in sales in the current year compared to the previous year. The results of testing the second hypothesis suggested that there was no second degree relationship between the overconfidence and the cost of equity. Although there was a positive relationship between the overconfidence and the cost of equity, as its significance level was less than 0.05, the second hypothesis was rejected. The results of this study were inconsistent with the results of the research conducted by Aghazadeh et al. (2018), which showed a non-linear

relationship between COE's overconfidence and cost of equity capital. It means that the average level of CEO's overconfidence would lead to the lowest cost of equity capital. In Iran, there was positive but not significant relationship between overconfidence and the cost of equity. Although based on theoretical foundations presented in the second chapter of the research and according to the research conducted by Aghazadeh et al. (2018), a nonlinear relationship between overconfidence and cost of equity was confirmed, based on the results of the present study, there was no linear and nonlinear relationship overconfidence and cost of equity. The reason for the rejection of the research hypothesis was the fact that information is not usually available to everyone in the capital market of Iran, so there is information asymmetry in the capital market of Iran, leading to making non-rational decisions. The lack of a precise criterion for assessing the quality of information disclosed by companies and weakness and superficiality of the monitoring mechanisms of existing institutions, including the Stock Exchange and its trusted auditing institutions make the reporting poor, which has merely formality and non-practical aspect. This weakness affects the decisions of the investors and creditors of the business unit. Moreover, the cost of financing in Iran is almost equal for all companies. In other words, the poor quality of reporting and the almost equal rate of financing costs of all listed companies in the stock exchange cause that the managers' overconfidence do not have an effect on the cost of equity.

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