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Investigating the Effect of Managerial Entrenchment on Bias Overconfidence in Companies Listed in Tehran Stock Exchange

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ABSTRACT

Tenured And Possessive Behavioral words are in the area of financial theories that is in line with the theory of representation, it seeks to narrow the gap of interest between shareholders and investors and guide the company's decisions to maximize shareholder interest. The purpose of this research is the effect of managerial entrenchment of bias overconfidence in companies listed in Tehran Stock Exchange. In this study, 111 Tehran Stock Exchange companies were studied in the period of 2014 to 2018. In this research, in order to measure the managerial entrenchment three criteria were used CEO tenure; Managerial ownership and DUAL And bias overconfidence were measured by two criteria overconfidence-excess capacity and excess debt capacity investment. The results showed a significant positive effect managerial entrenchment On Both overconfidence measure of excess capacity and excess debt capacity investment.

Keywords

Managerial Entrenchment, Bias Overconfidence, Excess Debt Capacity Investment, Overconfidence Measure of Excess Capacity.

1. Introduction

The basic concept of leadership across a broad spectrum is defined as a network of relationships that encompasses not only a company and its owners but also all stakeholders including employees, customers, people, society, etc. (Nazemi et al., 2014: 160). The most important pillar of this system is the managers whose decisions can be influential in a large area and must be accountable to a wide range of stakeholders (Bryant Kocher et al., 2013: 476). However, are managers accountable for their responsibilities and accountability to shareholders, investors, and stakeholders in general? These kinds of questions are always one of the most important challenges of agency costs, especially in the capital market, where the CEO as a representative should protect and protect the rights of shareholders and investors and strive to maximize their wealth. However, corporate executives often act in conflict with their interests with shareholders; a space that may not always be obvious to stakeholders, where the CEO pursues his own interests while displaying benevolent decisions for the company and shareholders (Ulupinar, 1). On the other hand, among the shareholders, what is considered to be one of the most challenging issues in the ownership domain is mainly the share of executives in the ownership of the company, since the role of executives is very important in the future performance and direction of the company. Managers have access to inside information and corporate news on the one hand, and they have great decision-making power on the other. For this reason, it is important to pay attention to the managers' approach to consolidating their position in the company (Golkhandan, 2017: 87). In this regard, Wang (2011) and Ulupinar (2018) stated that managers are trying to build a strong fortress about maintaining their managerial position. Evidence based on the findings of the Stickel (1992) and Hong & Kubik (2003) research suggests that the more the CEO enters into entrenchment, the greater the value of the firm's decline, as the existence of tenure-based behavior at the capital market level is particularly sensitive, and this reduces the value of the company while reducing its credibility. In fact, according to agency theory, the existence of consecutive terms of CEO tenure and managerial entrenchment during the tenure of the management profession is one of the most challenging discussions among shareholders and managers, because there is always the subjective presumption that conflict of interest make shareholders suspect of the self-interest of managers (Jensen & Ruback, 1983: 21). Managers who place special value on control and gain significant personal benefits from it, even though they know they do not have the qualifications and requirements to manage that company, still try in various ways to change the situation to their advantage and to consolidate their position in the company (Shleifer and Vishny, 1989: 125). A group of researchers, such as Morck et al. (1988), Pound (1987), and Shleifer and Vishny (1989), believe that managers who have taken control of the situation over time and have promoted entrenchment through unethical practices, such as lobbying with the board, are increasing their decision-making power. In other words, Managerial entrenchment refers to the amount of effort that a manager makes to control and control the affairs in such a way as to change the way he or she wants (Berger et al., 1997: 1411), conditions in which the interests of the manager are prioritized. Importantly, the entrenchment can be like a double-edged sword. Some scholars, such as De Miguel et al. (2004), Cheng et al. (2013), and Claessens et al. (2002), argue that managerial entrenchment is not necessarily driven by profit-driven incentives, but rather that a CEO may try to maintain his position in a sense of responsibility and free from political and party affiliation, through his ability to better understand the market and its changes in order to adapt to those conditions, as he or she can then stabilize the practice within the company and among competitors. However, some researchers have also examined the negative effects of entrenchment. For example, Stein (1989) stated that a manager, who finds himself in an unstable position caused by market pressure and competition, by increasing the return on value, sends the signal that the company is in good shape to shareholders. Therefore, managers who are under pressure from the market are likely to choose projects that lead to quick returns and sacrifice long-term investments with a greater interest in their unstable position. In this regard, Clark et al. (1) argue that, according to narcissistic theory, managers with a tenure-based approach always have a behavioral bias in a firm's decision-making and practices. Although these biases may not be the same in different situations, the origin of these biases lies in the internal behaviors of these managers. In other words, according to Machiavellianism theory, power-hungry

and narcissist managers always prioritize achieving their own interests and are clear indications that "the end justifies the means". In fact, they have job entrenchment to solidify their managerial position and make decisions based on biases to maintain their position in the firm's decision-making process (Chen et al., 2015: 385). In fact, behavioral finance criticizes behaviorally efficient market hypotheses and states how psychological forces influence investment decisions and cause behaviors to shift from rational presumptions to opportunistic behaviors and financial markets to behave inefficiently (Tawousi et al., 2018: 294). Theoretical models show that the alignment of rational traders with people suffering from cognitive or psychological weaknesses leads to inaccurate pricing and systematic errors. Behavioral factors, for example, may resonate with irrational traders. This line of research shows that a sufficient number of agents suffering from behavioral biases can lead to overconfidence, herd behavior, momentum trading, and other biases such as optimism or shortsightedness, which, in turn, leads to financial volatility (instability) (Roger et al., 1: 1). Thus, the purpose of this study was to investigate the impact of managerial entrenchment on overconfidence as a behavioral bias in the capital market.

2. Literature Review

2.1. Managerial Entrenchment on Overconfidence Bias

Shleifer and Vishny (1989) while noting that managers are reluctant to maximize shareholder wealth according to agency theory, based on agency theory, which was the result of their research, showed that managers use their authority to achieve their personal goals and do not pay attention to the value of the company to stabilize their position. They consolidate their position through low-risk special investments, demonstrating that they have a valuable role in shareholder interests (Khaneghah and Zinali, 2017). The presence of these approaches indicates a level of entrenchment for the continuation and consolidation of management positions. According to Marouan (2015), entrenchment is a managerial approach that is concerned with strengthening the position of manager and encompasses all behaviors that preserve jobs, increase decision-making, and maintain personal gain. On the other hand, CEO overconfidence is one of the newest financial behavioral concepts that has gained prominence in both financial theory and psychology. Overconfidence causes individuals to overestimate their abilities and to underestimate risks, and this creates the feeling that they are able to control issues and events while they may not (Qaderi et al., 2018). It is noteworthy that overconfidence, as one of the most serious issues affecting corporate CEO decisions, encompasses the most important modern financial behavioral concepts that have a particular place in both financial and psychological theories. CEO overconfidence refers to a level of management decisions that automatically overestimate the likelihood of good company performance and underestimates the likelihood of poor company performance (Haji Ebrahimi & Eskandar, 2019). In fact, overconfidence can be created as a consequence of managerial entrenchment affecting the presentation of financial information by the manager to the capital market. This is because a manager with an entrenchment approach, as a decision-maker, firstly strives to maintain the attractiveness of investing in future returns for shareholders, and then pursues long-term shareholder value by continuing numerous investment projects. On this basis, he would be reluctant to disclose confidential information that has negative investment feedback, in which case positive accruals may be utilized to convey optimistic future estimation approaches (Scherand & Zechman, 2011) or even delay in identifying losses (Ahmed & Duellman, 1). Tirole (3) also states that managers who use entrenchment to consolidate their positions through lobbying with board members and increase the share of their managerial finances try to overestimate the likelihood and impact of favorable events on company cash flows and underestimate the likelihood and impact of negative events. According to this approach, managerial entrenchment will lead to the overestimation of return on investment and underestimation of risks (Kolasinski & Li, 2013). In fact, the overconfidence of the manager, which can be a consequence of managerial entrenchment, is an error of estimation in making the right decisions about the future, which can increase the risk of investing in the company for shareholders and investors. Accordingly, the first hypothesis of the study states that:

- **First Hypothesis:** Managerial entrenchment affects overconfidence through excess investment.

Secondly, the managerial entrenchment will make finance managers value stocks too expensive and seek to manage the resources needed to fund their projects by raising the level of debt. This suggests that the CEO avoids making more commitments to shareholders and assessing the increased lobbying of financial partnerships between banks and creditors to maintain their position more appropriately (Kolasinski & Kothari, 2008). Mathew and Yildirim (2015) also consider the existence of lobbying with financial analysts as another attempt by managers with an entrenchment approach to delineate increased debt through facilities as a reason for the manager's outlook for the capital market, particularly shareholders and investors. Chen et al (2015) also suggest that managers who undertake entrenchment need the assistance of financial analysts at the capital market level to cover debt excess due to behavioral biases based on overconfidence. In this way, they will maintain their confidence and confidence in the capital market. In fact, because of the high information asymmetry caused by the negative disclosure of capital markets, managers with an entrenchment approach use lobbying with financial analysts for seductive advice to shareholders and investors to persuade them to keep their market shares at market level even though the debt excess capacity is due to CEO overconfidence (Ulupinar, 2018). On the other hand, Fairchild (2005) knows the role of CEO tenure more effective and considers the CEO's demand for long-term tenure in parallel with increasing levels of CEO overconfidence. He said that managers with overconfidence tend to have a high level of leverage that could lead to higher financial crisis costs and riskier debt relief and equity. Therefore, the second hypothesis of the study states that:

- **Second Hypothesis:** Managerial entrenchment affects overconfidence through excess debt capacity.

2.2. Research Background

Ji et al. (2019) conducted a study entitled "Managerial Entrenchment and Capital Structure: A Test of Different Corporate Strategies". This study was conducted over a period of 1998 to 2014 years and 6873 observations (firm-year) were evaluated. The results showed a positive and significant relationship between managerial entrenchment and the debt structure of the firms surveyed. On the other hand, corporate diversification strategies, measured by the entropy index, exacerbated the negative impact of managerial entrenchment on capital structure in a negative direction. Ulupinar (2018) conducted a study entitled "Investigating the Impact of Managerial Entrenchment on Analytical Bias". In this study, which was conducted on the American Stock Exchange companies in the period from 1994 to 2006, 5 companies were surveyed. In order to measure the data of interest, this study used the tenure and managerial ownership as a comprehensive index to calculate managerial entrenchment and examined analytical biases in the form of shortsightedness and overconfidence. Regression and EViews software were used to test the research hypotheses. The results of this study showed that managerial entrenchment increases managerial overconfidence and shortsightedness biases so that the impact of managerial entrenchment on shortsightedness due to managers' short-term focus on higher returns and neglecting investment in research and development is stronger than that of managerial overconfidence. Di Meo et al (2017) conducted a study called "managerial entrenchment and profit management". The study, conducted between 1992 and 2014, surveyed 146 companies in both Florida and Delaware. In this study, earnings management was evaluated based on the modified Jones model (1) and managerial entrenchment was measured based on three indicators of information asymmetry, tenure, and managerial ownership. The results of this study showed that managerial stability is negatively and significantly correlated with earnings manipulation and accrual, and it was found that if the manager is well maintained, earnings management cannot be considered as an important factor for company value. Malmendier & Tate (1) conducted a study entitled "CEO Behavior: A Role in Managerial Overconfidence". In this study, managerial behaviors such as increasing managerial ownership and task duality were measured. The research period was from 1997 to 2012 years, during which 2341 observations (firm-year) were examined and the statistical population of the study was US corporations. The results showed a positive and significant relationship between managerial tenure and managerial overconfidence. Jiraporn et al. (2014) conducted a study entitled "Analyzing, Board Diversity, and

Managerial Entrenchment". In this study, 98 US stock exchange companies were studied in the period of 1990 to 2006. For the purpose of analytical power, the managerial capability variable based on Dimmer-John et al.'s model (2013) was used and the diversity of the board of directors was examined in terms of political communication and board independence. The tenure criterion was used to measure managerial entrenchment. The results showed that the analyzing power in management leads to more favorable interaction with board members, which reinforces management's position and enhances management's entrenchment in line with the interests of the board, company, and shareholders. Malgharni and Khodabandehlu (2019) conducted a study entitled "The Impact of Cash Retention Adjustments and Managerial Transfers on Companies Listed in Tehran Stock Exchange". The data of 118 companies for the fiscal years of 2009-2016 were collected as a statistical sample. In this study, two indices of CEO duality and share ownership percentage were used to measure management entrenchment. The results showed that cash holding adjustments are effective on managerial entrenchment. In addition, the rate of cash flow adjustments is affecting managerial entrenchment. In fact, the results showed that adjustments and the speed of cash holdings affect managerial entrenchment in the companies listed on the Tehran Stock Exchange. Ghaderi et al (2018) conducted a study entitled "The Influence of Behavioral Factor of Managers' Overconfidence on Risk Management Effectiveness". In this regard, three measures of profit estimation error, investment expenditure, and overinvestment were used as indicators of managers' overconfidence, and four factors of strategy, efficiency, reporting, and compliance were used to calculate risk management effectiveness. The method of measuring managers' overconfidence was based on managers' investment decisions, and the method of measuring risk was based on the ability of managers to achieve the goals set by companies. The sample of the present study was 115 companies listed in Tehran Stock Exchange and was analyzed by combined data method and fixed effects model. Based on the results of this study, organizational risk management practices are affected by managers' behavioral bias and overconfidence and will lose their effectiveness. Therefore, the effect of managers' overconfidence on risk management is accepted. Taghizadeh Khaneghah and Zinali (1) conducted a study entitled "The Influence of Boardroom and Management Entrenchment Features on Corporate Diversification Strategy" from 2008 to 2014. In this study, 110 companies were surveyed and the results showed that board size and independence had a positive and negative effect on company diversification, respectively. This means that in companies with large boards of directors and low independence of board members, company diversification is high. The results also showed that CEO duality and increased investment risk had a more positive effect on company diversification, while managerial ownership did not affect company diversification.

3. Methodology

The present study was applied research in terms of purpose and a quasi-empirical post-event research in terms of data gathering method in the field of positive accounting research conducted by a logistic regression method. The statistical population under study was companies listed in Tehran Stock Exchange during the years 2014 to 2018 and the selective sample of the study was companies with the following set of conditions:

1) Companies that have been admitted to the stock exchange before 2014 and are on the stock exchange list by the end of 2018.
2) Companies whose fiscal year ends in March.
3) Companies that have not changed the business or changed fiscal year during the above-mentioned years.
4) Companies that are not part of the investment and financial intermediation companies (investment companies were not included in the statistical population because of the nature of the activity compared to other companies).

After applying the above limitations, 111 companies were selected as the research sample. The data of the present study were extracted from the CDs of the statistical and image archive of the Tehran Stock Exchange, Tehran Stock Exchange web site, and other related databases, as well as from the Rahavard Novin software. Due to the bi-directionality of the dependent variable of logistic regression, the final analysis of data was performed using SPSS software.

3.1. Research Variables

3.1-1. Independent Variable

3.1.1.1. Managerial Entrenchment

To measure managerial entrenchment following the research of Di Meoa et al. (2017) and Bebchuk et al. (2009), virtual variables 0 and 1 were calculated based on the three criteria of CEO tenure, managerial ownership, and managerial duality. The virtual variable was used based on the above three criteria because it was expected to reduce disturbances in each of these three different dimensions (Larcker et al., 2007: 969). Each of the three criteria for CEO tenure, managerial ownership, and CEO duality is described.

- **CEO Tenure**

CEO tenure extends over time. (Shen, 2003: 470). Managers at the beginning of their tenure need to develop their management skills to meet their new job needs. They may then be able to meet their opportunistic motives. Frederickson et al. (1998) also stated that if the CEO tenure is less than a year, they seek to meet the needs of their professional domains, and may then start seeking power and self-esteem. On this basis, according to the research of Di Meoa et al. (2017) and Bebchuk et al. (2009), 0 and 1 were used to measure this variable; if the CEO tenure was 3 years or more, then the value 1 is assigned to it, otherwise 0.

- **Managerial Ownership**

Based on previous research, De Miguel et al. (2004) argues that CEOs with managerial stability have a moderate level of managerial ownership. When managerial ownership is below a certain threshold, the capital market reduces their opportunism by controlling the incentives of managers, thereby reducing agency costs. However, if managerial ownership is above a certain threshold, the interests of managers are likely to take precedence over those of shareholders. According to most models, managerial ownership is measured by the percentage of shares held by managers relative to the total ordinary shares held by shareholders. However, this study follows the model of De Miguel et al. (2004), which used the corporate value criterion to measure managerial ownership, and determined that the corporate value in the range of managerial ownership fluctuated between 18.8% and 50.06%.[1] Accordingly, if the percentage of managers' share relative to the total ordinary shares held by shareholders falls within this range, the value 1 is assigned to it, otherwise 0.

- **CEO Duality**

According to research by Gompers et al. (2003) and Bebchuk et al. (2009), CEO duality is calculated as a bidirectional criterion of 0 and 1. If the CEO is the director or vice-chairman, the value 1 is assigned to it, otherwise 0.

Finally, for the calculation of managerial entrenchment, if at least two of the three factors are present in a company, the value 1 is assigned, otherwise 0.

3.1.2. The Dependent Variable

3.1.2.1. Overconfidence Bias

A study of the thematic foundations suggests that different criteria have been proposed to measure overconfidence. These metrics include managers' decisions about the stock options (Malmendier et al., 2011), net purchases of the firm's shares by the CEO (Ahmed & Duellman, 2012), media reputation and the relative remuneration of managers (Malmendier & Tate, 2005), and firms' investment decisions (Ben David et al., 2010). Since companies listed on the Tehran Stock Exchange do not disclose or incompletely disclose these data, the Over-Invest criterion was used based on the Ahmed and Duellman (2013) model whose reliability in domestic research, such as research by Hasani al-Qar and Rahimian (2018), Mehrani and Taheri (2017), and many other, studies have been approved. The results of these studies have shown that corporate investment decisions contain information about the degree of managerial overconfidence (Mehrani & Taheri, 2016: 155).

Over-Invest criterion: This criterion is the concept of excess investment that is calculated from the regression of asset growth to industry-level sales growth as described in equation (1). For this purpose, the regression model of the equation (1) was estimated cross-sectionally and then calculated for each remaining year of the regression model. If the remainder of this equation is greater than zero for the company (positive), it means that the company is over-invested and the value 1 is assigned for this variable, otherwise 0.

$$\text{ASSET GROWTH}_{it} = \beta_0 + \beta_1 \text{SALE GROWTH}_{it} + \varepsilon_{it}$$

where ASSET GROWTH_{it} is the asset growth of company i at time t, SALE GROWTH_{it} is the sales growth of company i at time t. Asset growth and sales growth are also calculated using equations (3) and (4):

$$\text{ASSET GROWTH}_{it} = \frac{\text{ASSETS}_{it} - \text{ASSETS}_{it-1}}{\text{ASSETS}_{it-1}} \quad (3)$$

$$\text{SALE GROWTH}_{it} = \frac{\text{SALE}_{it} - \text{SALE}_{it-1}}{\text{SALE}_{it-1}} \quad (4)$$

The use of this index is based on the fact that in companies where assets grow at a higher rate than sales, managers invest more in the company than their counterparts (1). In other words, managers tend to be more confident about investing in assets than selling.

Over-Lev criterion: The excess of debt-to-equity ratio of companies over the industry, the second criterion of overconfidence in this study, was used following the research of David et al. If the debt-to-equity market ratio is larger than the median of the industry of interest in the same year, managers are overconfident. If managers are more confident about this variable, the value 1 is assigned, otherwise 0.

3.1.3. Control Variable

- **Return on Assets (ROA)**

Asset return indicates the ability to manage efficient use of assets and focuses more on the return on operations. This criterion, together with the debt ratio (the measure of the firm's use of financial leverage), constitutes the DuPont system. If surplus assets are used in operations, it is as if operating costs have increased. One of the important benefits of the asset return rate formula is that it forces managers to control operating assets and always controls operating assets by controlling costs, net income rates, and sales volume (Karami & Akhundi, 2016).

$$\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}} \quad (19)$$

- **Return on Equity (ROE)**

Bargeron et al. (2010) and Koerniadi et al. (2014) point out that profitable companies usually have large financial resources and investment opportunities and are expected to be more risk-taker than others are. Hence, in this research, equity return was used as a profitability measure of the company, which is calculated according to the following equation:

$$\text{Return on equity (ROE)} = \frac{\text{Net Income}}{\text{Equity}} \quad (20)$$

Market Share: In order to measure this variable, according to Higgins et al. (2015) research, the ratio of sales of each company to the total sales of the industry in which the company is operating was used. Therefore, a high ratio indicates a larger market share.

3.2. Research Model

In this study, the following models (1) and (2) were used for the first and second tests:

$$\text{Over} - \text{Invest}_{it} = \alpha_0 + \alpha_1 \text{managerial entrenchment}_{it} + \alpha_2 \text{ROA}_{it} + \alpha_3 \text{ROE}_{it} + \alpha_4 \text{Market Share}_{it} + \varepsilon_{it}$$

$$\text{Over} - \text{Lev}_{it} = \alpha_0 + \alpha_1 \text{managerial entrenchment}_{it} + \alpha_2 \text{ROA}_{it} + \alpha_3 \text{ROE}_{it} + \alpha_4 \text{Market Share}_{it} + \varepsilon_{it}$$

where $\text{Over} - \text{Invest}_{it}$ is the excess investment of company i at time t, $\text{Over} - \text{Lev}_{it}$ is the excess debt capacity of the company i at time t, $\text{managerial entrenchment}_{it}$ is the managerial entrenchment of the company i at time t, ROA_{it} is the return on assets of the company i at time t, ROE_{it} is the return on equity of company i at time t, Market Share_{it} is the market share of the company i at time t; and ε_{it} is the remainder of the regression.

4. Results

4.1. Descriptive Statistics

In order to study the general characteristics of the variables, as well as to estimate the model and analyze them in detail, it was necessary to know the descriptive statistics about the variables. Table (1) shows the descriptive statistics of the variables under test including some central and dispersion indices for a sample consisting of 5 firm-year observations over the period 2012-2017. Due to the nature of some of the research variables measured as 0 and 1, descriptive statistics are presented in Tables (1) and (2). Table (1) represents the mean, median, standard deviation, minimum, and maximum, and Table (2) shows the frequency of research variables.

As can be seen in Table (1), the mean descriptive statistics of CEO tenure showed that the mean CEO tenure is about 2.5 years, and based on maximum statistics, it was found that the longest CEO tenure in sample companies is 4 years. The mean CEO duality is

about 38%. The mean ROA shows that 12.4% of the firm's assets contributed to the profitability of the firms surveyed. Descriptive statistics of market share also show that total industry sales account for only 8.3% of each company's sales in the capital market. Following is the frequency of other research variables in Table (2).

Table (2) shows the descriptive statistics for the bidirectional or qualitative variables. Based on the results, it was found that 58.19% of the observations of the companies under study (323 observations) had managerial ownership and in 41.80% of the companies under study, the managers' share relative to total shareholders' equity is less than the limit set for calculating this variable. It was also found that in 394 observations (70.991%), managers had more than 3 years of tenure and in 161 observations (29.009 %), managers had less than 3 years of tenure. It was also found that 67.56% of the surveyed companies had overconfidence through the excess investment and 64.50 had overconfidence through the excess debt capacity.

Table (1) Descriptive statistics of the research variables

Variable	Observations	Mean	Median	Min	Max	SD
CEO tenure	555	2.463	2.013	1	4	1.026
Managerial ownership	555	0.578	0.604	0.014	0.979	0.189
Duality of duty	555	0.377	0.000	0.000	1	0.481
Overconfidence - excess investment	555	0.463	0.000	0.000	1	0.494
Overconfidence - excess debt capacity	555	0.405	0.000	0.000	1	0.438
ROA	555	0.124	0.112	-0.681	0.729	0.133
Market share	555	0.083	0.064	0.00013	0.797	0.121
ROE	555	0.192	0.186	0.007	0.594	0.211
Note: The larger the mean than the median indicates the large points in the data because the mean is affected by these values. In these cases, the data distribution is right-skewed.						

Table (2) Frequency of bidirectional variables based on the total observations

Variables	Present (1)		Absent (0)		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Managerial ownership	323	58.19	232	41.80	555	100
Duality of duty	256	46.12	299	53.87	555	100
CEO tenure	394	70.991	161	29.009	555	100
Overconfidence - excess investment	375	67.56	180	32.43	555	100
Overconfidence - excess debt capacity	358	64.50	197	35.49	555	100

4.2. Research Model Estimation

In order to estimate the research hypotheses due to the bi-directionality of the dependent variable of the research, namely weakness of internal control, the statistics of the goodness of fit test and Hosmer–Lemeshow test or assumption of fitness of model (model adequacy) were used based on logistic regression.

4.3. The Goodness of Fit Test

To test the GOF of the first hypothesis, the Omnibus Test was used to evaluate the performance of the model. In this test, the chi-square value (χ^2) indicates whether the independent variable affects the dependent variable.

Managerial entrenchment does not excess affect debt capacity and excess investment: $H_0: \chi^2 = 0$

Managerial entrenchment affects excess debt capacity and excess investment: $H_0: \chi^2 \neq 0$

Table (3) Omnibus Test

Test	Dependent criterion	χ^2	Degrees of freedom	Significance level	Result
Omnibus	Excess investment	11.807	3	0.002	H_0 is rejected
	Excess debt capacity	10.144	3	0.004	H_0 is rejected

As can be seen, given the significant level of chi-square (11.807 and 10.144) that is less than 5%, the influence of the model of independent variable, namely managerial entrenchment on two overconfidence measures, namely excess investment (Over-Invest) and excess debt capacity (Over-Lev), is

approved and fits in well with this model. Therefore, at the confidence level above 95%, the null hypothesis is rejected and the H1 assumption that the original hypothesis is accepted is confirmed.

Hosmer–Lemeshow test (the assumption of model fitness or model adequacy)

The Hosmer–Lemeshow test also confirms the usefulness of the model and provides an indication of agreement between observed results and predicted results. This statistic is a test for the null hypothesis and shows the suitability of the model. If the significance level is less than 5%, the fit is poor and the model is not suitable. Since the significant level of chi-square statistic (12.640) is greater than 5%, these results show that the data are sufficient for model fit.

H_0: Model fits (model data adequate)

H_1: Model does not fit (model data inadequate)

Table (4) Hosmer–Lemeshow

Test	Dependent criterion	χ^2	Degrees of freedom	Significance level	Result
Hosmer–Lemeshow	Excess investment	12.066	7	0.113	H_0 is accepted
	Excess debt capacity	11.736	6	0.104	H_0 is accepted

4.4. Pearson Correlation Coefficient

In order to examine more precisely the relationship between the research variables, first, according to Table (5), the Pearson correlation coefficient of the research variables was calculated.

Table (5) Pearson correlation coefficient

Dependent variable	Independent variable
	Managerial entrenchment
Overconfidence - excess investment	0.133*
Overconfidence - excess debt capacity	0.174**
*: Statistical significance at 5% error level **: Statistical significance at 1% error level	

As shown in the table above, based on the Pearson correlation coefficient, the relationship between managerial entrenchment and overconfidence-excess investment (Over-Invest) (0.133) and overconfidence-excess debt capacity (Over-Lev) (0.174) is positive and significant at the 5% level. This means that as the managerial entrenchment approach increases, the overconfidence bias is also increased.

4.5. Testing Research Hypotheses

The results of the test of research hypotheses (estimation of equation (2)) are presented in Table (6).

Based on the result of Table (6) regarding the first hypothesis, it should be stated that the of Cox-Snell and Nagelkerk coefficients represent the amount of change in the dependent variable, which is explained by the model and are equivalent to the coefficient of determination (R^2) in the linear regression. However, the exact R^2 is not possible in the logistic regression, which in the model fitted to the first hypothesis model is 11.5% and 16.3. These results show that at least 11.5 and at most 16.3 (almost lower and upper limit) percent of overconfidence-excess investment (Over-Invest) changes by independent and dependent variables are explained by logistic regression. Investigation of the regression coefficients of variables showed that the significant level of managerial entrenchment coefficient is equal to 0.113 and less than 5% and significant. These results show that there is a positive and significant relationship at a 5% error level of managerial entrenchment with overconfidence-excess investment. The coefficients of control variables also showed that all three control variables, namely return on assets with a coefficient of -0.105, market share with a coefficient of -0.115, and market share with a coefficient of -0.106, has a negative and significant relationship with overconfidence-excess investment. Also, expectation-prediction evaluation for binary specification was used to determine the accuracy of the model prediction. The results of the accuracy analysis of model prediction show that, in general, 16.32% of the cases, using the aforementioned model, one can correctly predict the overconfidence-excess investment or non-overconfidence-excess investment through the independent and control variables. Accordingly, 67.56% of companies under study over the study period had an overconfidence-excess investment (firm-year) and 32.43% of companies surveyed over the same period had a non-overconfidence-excess investment (firm-year). Based on the results, it can be stated that the sensitivity of the model in predicting firms with overconfidence-excess investment is higher

than in companies that do not have an overconfidence-excess investment.

Based on the result of Table (6) regarding the second hypothesis, it should be stated that the of Cox-Snell and Nagelkerk coefficients represent the amount of change in the dependent variable, which is explained by the model and are equivalent to the coefficient of determination (R^2) in the linear regression. However, the exact R^2 is not possible in the logistic regression, which in the model fitted to the first hypothesis model is 10.8% and 15.03. These results show that at least 10.8 and at most 15.03 (almost lower and upper limit) percent of overconfidence-debt capacity (Over-Lev) changes by independent and dependent variables are explained by logistic regression. Investigation of the regression coefficients of variables showed that the significant level of managerial entrenchment coefficient is equal to 0.376 and less than 5% and significant. These results show that there is a positive and significant relationship at a 5% error level of managerial entrenchment with overconfidence- debt capacity. The coefficients of control variables also showed that all three control variables, namely return on assets with a coefficient of -0.162, market share with a coefficient of -0.209, and market share with a coefficient of -0.098, has a negative and significant relationship with overconfidence-excess investment. Also, expectation-prediction evaluation for binary specification was used to determine the accuracy of the model prediction. The results of the accuracy analysis of model prediction show that, in general, 15.03% of the cases, using the aforementioned model, one can correctly predict the overconfidence-debt capacity or non-overconfidence-debt capacity through the independent and control variables. Accordingly, 64.50% of companies under study over the study period had overconfidence-excess debt capacity (firm-year) and 35.49% of companies surveyed over the same period had non-overconfidence-excess debt capacity (firm-year). Based on the results, it can be stated that the sensitivity of the model in predicting firms with overconfidence-excess debt capacity is higher than in companies that do not have overconfidence-excess debt capacity.

Table (6). The test result of the first research hypothesis

Dependent variable: Overconfidence **Observations: 555 (firm-year)**			**Time period: 2014-2018** **Number of companies surveyed: 111 companies**			
Variables	**First model**			**Second model**		
	Overconfidence-excess investment (Over-Invest)			**Overconfidence-excess debt capacity (Over-Lev)**		
	Regression coefficient	**Wald statistic**	**Significance**	**Regression coefficient**	**Wald statistic**	**Significance**
C	0.172	3.366	0.003	0.218	23.417	0.001
Managerial entrenchment	0.113	3.716	0.004	0.376	5.521	0.011
ROA	-0.105	-2.823	0.000	-0.162	-3.287	0.003
Market share	-0.115	-6.502	0.023	-0.209	-4.635	0.008
ROE	-0.106	-3.388	0.004	-0.098	-2.119	0.000
Cox and Snell coefficient of determination	11.5			10.8		
Nagelkerk coefficient of determination	16.3			15.03		
Likelihood statistics	132.617			125.17		
Correct prediction percentage of overconfidence	67.56			64.50		
Correct prediction percentage of non-overconfidence	32.43			35.49		
Overall predictive percentage of model	35.13			29.01		
Overconfidence based on a total of 555 observations	375			358		
Uncertainty based on a total of 555 observations	180			197		

5. Conclusion

The purpose of this study was to investigate the impact of managerial entrenchment on overconfidence bias in companies listed in Tehran Stock Exchange. The results of the first hypothesis test showed that managerial entrenchment was positively and significantly associated with an overconfidence-excess investment. In fact, it is the manager that, according to his motivations and approaches, adopts his policies and decisions to reduce or deepen the agency costs gap. The presence of profit-seeking approaches in the CEO will enable him to pursue his interests in a variety of ways, such as lobbying, for long-term corporate governance and consolidating his position through process benchmarks such as increasing the number of self-owned shares and the duality of duty. However, firms still have a strong tool to deal with this problem; it is the board of directors' characteristics. It will be an easy task now that firms can adopt effective boards that are able to reduce the negative impact of CEOs' optimism on corporate policies. Firms should advance the independence of their board in a special manner in order to guarantee their performances and so they will be able to align the interest of managers to that of shareholders. Our results imply that independent boards are able to reduce managerial optimism bias so they may reduce also its undesirable effects. Usually, managerial entrenchment comes with decisions to publish good news and to avoid publishing bad news to maintain a managerial position. These causes will make CEO decisions align with different biases, such as overconfidence-excess investment. In fact, the entrenchment makes the CEO overestimate the future returns from the company's investment projects and underestimate the likelihood of negative impacts. This delays the identification of losses and puts optimistic estimates on the value of current and long-term assets because of which capital expenditure increases. On the other hand, the existence of an entrenchment, which is more likely to be of a profitable origin, causes the CEO to try to maintain his position by presenting a more desirable image of himself at the capital market level, based on more confident bias. This will be an interesting way to architect the corporate governance mechanisms in a manner that assures its effectiveness. This may reduce the probability that firm's opted for sub-optimal corporate strategies and reduce distortions. Most likely, propagandas are far from reality and deepen the gap between expected returns and actual corporate investment returns. Simply put, these approaches will make managers, in the light of their ability, first consider themselves worthy of managing the company, and second, to consolidate their managerial position, maximize the profits and cash flows of the business unit. In order to create a positive outlook for risk and expected returns, they can achieve a more significant level of popularity and reputation. On the other hand, based on the result of the second hypothesis of the study, managerial entrenchment increases overconfidence through excess debt capacity. This is because the proprietary approaches to consolidating the management position make the optimal balance between the tax benefits of debt and bankruptcy costs disruptive, and make the company borrow more than it has anticipated based on theories such as equilibrium theory, financing hierarchy, and capital structure theories. In fact, these approaches make the manager behaviorally biased in his choice of financing policy. While overseeing a certain number of shareholders as a factor in maintaining its position and avoiding financing through the issuance of shares (because it considers the increase in new shareholders as a reason to reduce the probable scope of its power), he seeks external financing. In fact, these managers use all external capacity to attract cash resources whilst destroying the optimal structure balance. This makes them unable to respond appropriately to the potential opportunities and risks that may affect the business in the future. The results are in agreement with the research of Ji et al. (2019, Ulupinar (2018), and Malmendier & Tate (2015).

Based on the findings, it is recommended that specific rules and guidelines be adopted on the manner in which CEO and tenure periods are selected to protect the rights of shareholders and investors and provide a more coherent framework for firm performance in reducing agency cost gaps. In this way, firstly, a more accurate assessment of the performance of companies and especially managers of companies is made by regulatory agencies and secondly, the level of investment attractiveness at the capital market level increases. Lack of specific regulations regarding the CEO tenure can reduce the level of performance transparency of companies. On the other hand, it is suggested that to limit the CEO's decision to protect the interests of shareholders and investors through specialized oversight of criteria such as the optimal

level of investment and the optimal level of funding, and clear and transparent frameworks, structures. In this way, while increasing the firm's financial flexibility capability, the potential for bias in CEO decision-making, such as overconfidence in excess investment and excess debt capacity, is moderately controlled.

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Note

[1] Here, the logarithm of corporate stock market value was used to determine the corporate value.