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Providing a model for the impact of performance on the relationship between corporate governance mechanisms and the probability of firing the CEO

E. Gorjian Mehlabani*, Ch. Zhang, H. Askeri, A. Javadpour

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Abstract According to the agency theory and the separation of ownership from management, including the most important measures of a company is management changes. On the other hand, the cause of changing the executive's managers because of their effectiveness should be a special place in accounting research. In that light, this study investigates the effect of performance on the relationship between corporate governance mechanisms and the probability of firing the CEO. In this research, the studied population included companies listed on the Tehran Stock Exchange from March 21st, 2008 to March 21st, 2017. The systematic elimination method was used to narrow down the sample down to 65 companies that were examined in a nine-year period. The Eviews package was used to investigate the validity of the hypotheses relying on the logistic regression method. The results of the hypothesis test showed that firm performance has a significant negative effect on the relationship of institutional ownership, independent directors, and entrenching with CEO replacement. And performance also has a significant positive impact on the relationship between major ownership and CEO change. In addition, the results show that performance has a significant negative impact on the relationship between ownership (private and public) with CEO change. The impact of private ownership is less severe than state ownership.

Keyword: Corporate Governance, Chief Executive Officer (CEO), Performance, State Ownership, Private Ownership.

1 Introduction

The rapidly increasing rate of globalization and resulting changes in global markets exposes companies to currency-related, political, and new competition risks [1]. The global economic progress has led to the emergence of large corporations, most of which are forced to raise capital by selling shares in order to survive [2]. However, large corporations such as Enron,

* **Corresponding Author. (✉)**
E-mail: pro.gorjian@gmail.com (E. Gorjian Mehlabani)

E. Gorjian Mehlabani
Department of Probability and Statistics, Guangzhou University, Guangzhou, China

Ch. Zhang
Department of Probability and Statistics, Guangzhou University, Guangzhou, China

H. Askeri
Accounting Department, Non-profit organization Rozbahan, Sari, Iran

A. Javadpour
School of Computer, Guangzhou University, Guangzhou, China

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WorldCom, and Xerox collapsed due to weak corporate governance systems, inflicting substantial economic losses on their investors and shareholders [3]. Similar failures of corporations in other countries increased legal barriers [4]. The relationship between shareholders and managers of a company has a wide range of interests that leads to the separation of ownership and control, the difference between the goals of shareholders and managers, and the information asymmetry among executives and shareholders. In economics, all individuals seeking to maximize their wealth are assumed to have rational behavior; therefore, investors, shareholders, and managers are no exception to this rule [5]. Every shareholder hopes their company performs consistently well and increases its value. However, which members can influence the company's performance and raise their value? A CEO is at least one of the key figures. The shareholders hope the board of directors assigns the right person who can make the right decisions to increase the value of the company and reviews their decisions and actions. Moreover, when the CEO fails to live up to expectations, he is replaced with someone who appeals to the majority of shareholders different definitions depending on the specific worldview they adopt [6]. The term “corporate governance” originates from the Greek word of "Keyberman," which means "guidance or administration" [7]. The corporate governance system is a collection of guidelines, structures, processes, and cultural norms that can be materialized by companies and may include transparency in business processes, accountability to stakeholders, and respect for their rights. A well-functioning corporate governance system punishes the executive managers showing poor financial performance [8]. The CEO's position appears much different from other managers. Theorists argue that the dismissal or replacement of a CEO serves as an internal corporate governance mechanism to reduce agency losses [9]. According to Ying-Fenlin, factors affecting CEOs include the company's performance, corporate governance mechanisms, and CEOs' compensation [10]. Brown and Kaylor, Dietmar, and Smith showed that firms with better mechanisms of corporate governance had better performance and higher market value. The goal of corporate governance is to do away with opportunistic behavior in order to achieve organizational goals by resolving organizational problems. The agency theory suggests that management is responsible for firm performance. Therefore, changing and removing the managers, as one of the internal control mechanisms, reduces organizational problems in poorly performing companies. An overall review of the literature shows that corporate governance mechanisms can help reduce disagreements between the agent, the managers, and the stakeholders. From that perspective, an attempt was made at answering the question, “what is the impact of performance on the relationship between corporate governance mechanisms and the probability of CEO turnover in a company?"The responsibilities of the CEO mainly involve formulating and implementing effective strategies to achieve the goals and objectives set in line with the company's vision and mission [1]. CEO is the mastermind of the business [10]. It has been shown that replacing a company's CEO, the top position of the organization, can have both positive and negative effects on the company's performance. Deciding on the ousting of the current CEO and selecting his successor is particularly critical for companies. The new CEO can influence the company's activities in a meaningful way and ultimately increase profits. However, the new CEO also brings significant uncertainty to the company [11]. Regarding the above-mentioned issues and the existence of a conflict between the interests of corporate CEOs and owners, as well as the way CEOs are dismissed and appointed, in recent years, researchers have been keen to study, in the accounting-related research, the effects of corporate performance on CEO replacement; such that so far, interesting studies have been conducted in the field of corporate performance, CEO replacement and the factors influencing it throughout the world. However, what is

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important is that most studies have provided evidence of factors affecting CEO replacement; however, some scholars have also provided evidence against these studies. On the other hand, it is worth noting that so far no studies have been conducted on the effect of performance on the relationship between corporate governance mechanisms and CEO replacement; therefore, the present study aimed to investigate this relationship in order to provide effective solutions to improve the performance of companies. To address these issues, the remainder of the paper is organized as follows. ‘‘Background and Motivation’’ section presents the background and motivation for the research while the ‘‘Hypotheses Development’’ section is about the development of our hypotheses. ‘‘Methodology of the Empirical Study’’ section sets out the method of the empirical study for testing the hypotheses. ‘‘Result’’ section details and analyses the findings. ‘‘Discussion’’ section provides a discussion of the results and underscores the contributions made by this research. The conclusion provides a summary answer to our research question and opens up perspectives for future study.

2 Review of literature

Replacing the CEOs of the world’s leading companies is a major issue that attracted much attention due to recent financial scandals in these companies. Reference to theoretical foundations shows a large number of interesting studies conducted in this field, each focusing on the issue from a new angle. The purpose of this study is to evaluate the effect of performance on the relationship between corporate governance mechanisms and the probability of CEO turnover. The literature is reviewed to provide an outlook on the past research and clarify the stance of previous works on the role of corporate governance and performance in CEO turnover and also to find the shortcomings of the past studies and help resolve them, advance the existing knowledge, and confirm the novelty of the present attempt. To this end, a total of 15 papers published between 2009 and 2019 are reviewed to allow for reaching a broad understanding of the field [12]. In their study, the researchers examined the effects of CEO succession planning on firm performance and volatility. The researchers found heirs apparent are identified by comparing all of a firm's non-CEO top executives' promotion likelihood estimated based on a set of characteristics. Applying this heir apparent measure to a large sample of CEO turnovers from Execu Comp, the paper delivers robust evidence that firms with relay successions achieve higher post-turnover accounting performance, higher long-term stock returns, and lower volatility. Further, the positive effect of relay succession on performance is stronger for firms with higher human capital requirements. In [13], the researchers examined the effect of the CEO turnover on the sustainability of companies through identifying the impact of two major types of succession (internal and external succession) as well as the reasons for CEO turnover in French firms, and concluded that the replacement of the CEO had a positive and significant relationship with the sustainability of the company one year after the replacement of the CEO. This positive relationship is stronger when the new CEO comes from outside the company. The effect on the firm’s sustainability is always positive and significant, except for the voluntary resignation of the CEO. In their follow-up research, they argued that when a company already gained a high standard of sustainability, the appointment of a new CEO would have less impact on corporate sustainability performance. In [14], addressing the influence of the CEOs on the relationship between corporate performance and CEO turnover, the researchers found that poor firm performance leads to CEO turnover. In their follow-up research, they stated that the influence of the CEO has a positive and significant effect on the relationship between corporate

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performance and CEO turnover. In [15], they indicated that CEO compensation attributed to ownership characteristics in the private sector relates directly to the future performance of the firm. Duru et al. [16] investigated a study entitled "Dynamic Relationship between Managerial Duality and Corporate Performance (The moderating role of board independence). Their results showed that although managerial duality may reduce the performance of a firm through managerial interference, it could also generate profits for the firm in the presence of board vigilance. Fiordelisi and Ricci [17] investigated the relationship between corporate culture and leadership changes. Their results showed that the negative relationship between corporate performance and leadership changes is strengthened in a control-oriented culture but weakened in a creation-oriented one, eventually showing that a creation-oriented culture has a negative relationship with the probability of external CEO succession. Gao et al. [18] explored the relationship between corporate governance and CEO turnover. Their results showed that state-owned firms have high replacement rates, and the sensitivity of succession and performance in state-owned firms is higher than that of private firms. Zhang [19] examined the developments of a firm's performance as a result of a necessary replacement of the CEO, which led to a conflict between the board of directors and the CEOs. He measured firm performance using two methods: operating performance and abnormal stock returns. The results of his study indicated that the firms' operating performance declined preceding CEO turnover but improved following CEO turnover. However, unlike most studies, following the replacement of the CEO, the abnormal stock returns were negative, suggesting that the investors did not take the replacement of the CEO as good news when they had been dismissed due to a conflict. Ishak et al. [20] investigated the impact of corporate performance and the power of the CEO on their turnover. They believe that human capital and social networking theories have shown that CEOs take strength from their educational backgrounds, skills, know-how, specialties, experience, industrial expertise, prestige, ownership, age, and longevity. The power of a CEO allows them to shield themselves in the firm against decisions on their expulsion based on weak performance. In an empirical study, they presented evidence that showed firms with poor performance, and older managers are more likely to replace their CEOs. On the contrary, CEO turnover is less likely when firms experience the CEO/Chairman duality. Lindrianasari and Hartono [21] conducted a study entitled "The Relationship between Accounting Performance and CEO Turnover: Evidence from Indonesia", providing empirical evidence for the usefulness of accounting information on CEO replacement. They examined 140 companies listed on the Indonesian Stock Exchange during the 1998–2006 period. Carrying out their study, they test the corporate accounting performance using three indicators, namely return on assets, equity returns, and earnings. Their results showed that accounting performance generally has a significant negative effect on CEO turnover. However, CEO turnover has no effect on accounting performance [22]. The under-presence of women on the board has recently become a major issue to be considered as regards the benefits of gender diversity in the council chambers. This study aimed to examine the relationship between gender diversity in the board and corporate performance. The findings showed that there is a positive relationship between gender diversity and corporate performance and that female executives can affect corporate performance. In their study entitled "Corporate Governance Internal Mechanisms, CEO Replacement, and Income Management", Hazarika et al. [23] showed that the board of directors tends to raise managers who excessively manage revenues before these manipulations result in costly external outcomes. Friedl and Resebo [24] conducted a study entitled "The Effects of CEO Replacement on Corporate Performance". In this research, they investigated whether CEO turnover has a significant effect on the performance of the firm. The statistical analyses of this

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research showed that the replacement of the CEO has a negative correlation with the development of the firm's shares. It also showed that CEO turnover affects corporate performance; furthermore, strategic leadership perspectives, as well as strategic choices, are better used in describing a CEO's effect in a firm. Adams and Ferreira [25] examined the presence of women in the boardroom and their impact on governance and performance. Their results showed that the boards with gender diversity would do more in monitoring CEO performance. On this basis, CEO turnover is obviously more sensitive to stock performance, and the rate of CEO turnover is higher in firms with more gender diversity. However, the average impact of gender diversity on firm performance is negative. The results of the present study also showed that setting gender penalties for managers can reduce corporate value in well-managed companies. Yuan [26] examined the impact of managerial foundation on managerial-financial changes in Chinese companies. The results of the research showed that the stronger the managerial foundation, the lower the leadership changes. Further, it was shown that managers' sensitivity to corporate performance decreases with enhanced managerial foundation. Moreover, the regression results revealed a discrepancy between the impact of the levels of managerial foundation on CEO changes, and that leadership changes are less sensitive to performance in the companies with robust managerial foundation.

Table 1 The details of literature review.

Authors	Method of test	Findings
Tao and Zhao [12]	panel data analyses	the positive effect of relay succession on performance is stronger for firms with higher human capital requirements.
Bernard et al. [13]	panel data analyses	The findings show that expectations of CEOs are not solely economic and financial but also concern CSP. In terms of governance, they should prompt shareholders looking to strengthen CSP to choose new CEOs from outside the firm and to encourage the firm to participate in the GRI.
Magnusson and Enarsson [14]	panel data analyses	The relationship between firm performance and CEO turnover with CEO entrenchment as a moderator Consistent with previous research our results partly show that there is a significant negative relationship between prior firm performance and CEO turnover.
Jaiswall et al. [15]	panel data analyses	CEO compensation attributed to ownership characteristics in the private sector is positively related to future firm performance.
Duru et al. [16]	panel data analyses	The results are robust across a number of sensitivity tests. The findings are consistent with arguments advanced by both agency theorists and some management scholars that though duality might reduce firm performance through managerial entrenchment, it can provide benefits to the firm in the presence of board vigilance.
Fiordelisi and Ricci [17]	multivariate regression analyses	The negative relationship between firm-specific performance and CEO turnover is reinforced by the control-oriented culture and reduced by the creation-oriented culture. Finally, we study the CEO insider or outsider succession and observe that the creation-oriented culture has a negative relationship with the probability of hiring an outsider.
Gao et al. [18]	multivariate regression analyses	state-owned enterprises have a higher replacement rate and the sensitivity of the replacement and performance in public companies than private companies.
Zhang [19]	multivariate regression analyses	Results show that a firm's operating performance declines preceding turnovers and improves following turnovers. However, unlike most previous studies, we find negative abnormal stock returns following CEO turnovers, suggesting that investors do not perceive CEO turnover announcements as good news when CEOs are dismissed for conflicts.also The results show no significant relationship between these variables and firm performance.
Ishak et al.	multivariate	Our results show that firms with poor performance and older CEOs are

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[20]	regression analyses	more likely to change their CEOs. In contrast, CEO turnover is less likely to occur when firms exercise CEO/Chairman duality; have CEOs who own a certain portion of company shares, and have CEOs with longer tenure.
Julizaerma et al. [22]	the ordinary least square regression method	The finding indicates that a positive association exists between gender diversity and firm performance. This suggests that women directorship may influence firm performance.
Hazarika et al. [23]	Multinomial logistic regressions	results indicate that boards tend to act proactively to discipline managers who manage earnings aggressively before the manipulations lead to costly external consequences.
Lindrianasari and Hartono [21]	LOGIT (separately) model	The overall results indicated that decreasing accounting and market performance within a company, in an average period of three years, encouraged CEO turnovers.
Friedl and Resebo [24]	panel data analyses & linear regression analysis	results indicate that changing CEO does affect company performance and that the Strategic Leadership and Strategic Choice perspectives are better at describing a CEO's effect within a company.
Adams and Ferreira [25]	panel data analyses	Their results suggest that gender-diverse boards allocate more effort to monitoring. Accordingly, we find that chief executive officer turnover is more sensitive to stock performance and directors receive more equity-based compensation in firms with more gender-diverse boards. However, the average effect of gender diversity on firm performance is negative.

3 Research Method

The accounting studies are generally categorized into the positivism classes because the accounting scholars conduct studies in accordance with the fact that the concepts of the real world are measurable by the statistical methods. They believe in the independence of the examiner and the subjects. This study describes the existing and real situations without any manipulation. Therefore, this study is classified as a descriptive study that uses historical information in testing the hypotheses and applied research in terms of research objectives. This is also classified as a descriptive correlation study concerning the influence of Performance on the Relationship between Corporate Governance Mechanisms and the Probability of Chief Executive Officer (CEO) Replacement. It is also a cross-sectional study as it examines data related to a specific period of time (from 2008 to 2016).

3.1 Hypotheses

Agency theory (JensenandMeckling1976) addresses agency relations whereby one party (the principal) delegates a job to another party (the agent). The theory is aimed at solving agency problems. Because the functions of ownership and decision making are separate, the CEO wields considerable power. Consequently, there is a risk that managers will seek to of the interests of the company owners and the community at large. This situation, therefore, prompts the introduction of control mechanisms, one of which is the board of directors. One of the most closely studied relations in agency theory is the connection between the board of directors and the firm's performance. The primary idea in these models is that performance is indirectly related to the presumed roles of the directors. Among these roles, the decision to change the CEO has pride of place. Published empirical studies show that changes in CEOs have substantial effects on firms. We focus on CEO turnover decisions because it is perhaps

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one of the most important corporate decisions. The board of directors will have to make a decision about whether to retain the CEO after a bad stock performance or accounting performance [13]. Failing to replace a poorly performing CEO is arguably the costliest manifestation. Additionally, CEO turnover has a substantial long term impact on the operating business of the firm as well as the investment and financing decisions [13]. In this section, we develop our research hypotheses, by proposing six variables for corporate governance and examining the impact of performance variables on the relationship between corporate governance mechanisms in managing change. A hypothesis is a knowledge-based conjecture with experience in solving a problem, and it can be considered as a hypothetical relationship between two variables. Problem articulation only guides research in general and does not include all research specific information, so the problem will never be solved scientifically unless it is hypothesized or assumed. In this study, the research hypotheses are explained as follows:

The main hypothesis of research: Performance has a significant effect on the relationship between corporate governance mechanisms and the probability of CEO replacement.

- First hypothesis: Firm performance has a significant effect on the relationship between institutional ownership and the probability of CEO replacement.
- Second sub-hypothesis: Firm performance has a significant effect on the relationship between major ownership and the probability of CEO replacement.
- Third sub-hypothesis: Firm performance has a significant effect on the relationship between independent managers and the probability of CEO replacement.
- Fourth sub-hypothesis: Firm performance has a significant effect on the relationship between the manager's position and the probability of CEO replacement.

Fifth sub-hypothesis: Firm performance has a significant effect on the relationship between private and public ownership and the probability of CEO replacement.

3.2 Research models and its Variable

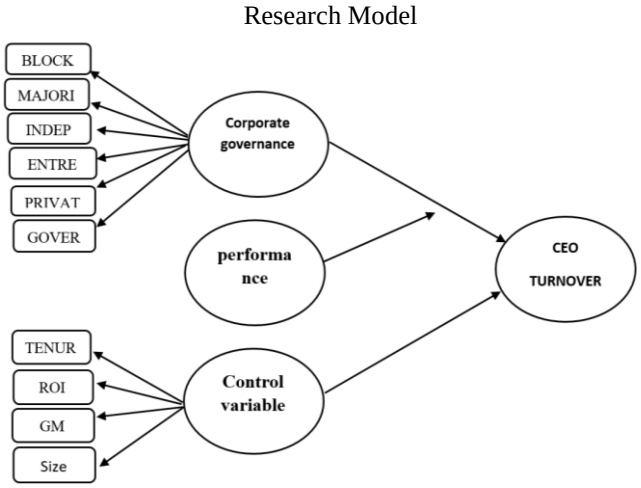

Fig. 1 Conceptual model of research

The following model was used for testing the first, second, and third hypotheses:

$$TUOR_{it}= \beta_0+ \beta_1 PERF_{it}+ \beta_2 INDEP_{it}+ \beta_3 PERF_{it}*INDEP_{it}+ \beta_4 BLOCK_{it}+ \beta_5 MAJORITY_{it}+ \beta_6 PERF_{it}*MAJORITY_{it}+ \beta_7 PERF_{it}*BLOCK_{it}+ \beta_8 CONTROL_{it}+ \varepsilon_{it}$$

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- (PERF): performance
- (BLOCK): Major shareholder's (Blockholder's) ownership
- (MAJORITY): Institutional Ownership
- (INDEP) Independent managers
- (ENTRENCH) Entrenching
- (PRIVATE): Private ownership
- (GOVER): state ownership
- (TURNOVER): Change of CEO or CEO turnover

Testing out the first hypothesis: In order to confirm the first hypothesis based on the output of the regression model, it is necessary that $\beta 6 \neq 0$.
Testing out the second hypothesis: In order to confirm the second hypothesis based on the output of the regression model, it is necessary that $\beta 7 \neq 0$. Testing out the third hypothesis: In order to confirm the third hypothesis based on the output of the regression model, it is necessary that $\beta 3 \neq 0$.

The following model was used to test the fourth hypothesis of this study:

$$TUOR_{it}= \alpha_0+ \beta_1 PERF_{it}+ y_1 ENTRENCH_{it}+y_2 PERF_{it}*ENTRENCH_{it} + \beta_2 BLOCK_{it} +\beta_3 MAJORITY_{it}+ \beta_{12} PERF_{it}*BLOCK_{it}+ \beta_{13} PERF_{it}*MAJORITY_{it}+ \varepsilon_{it}$$

Testing out the fourth hypothesis: In order to confirm the first hypothesis based on the output of the regression model, it is necessary that $y2 \neq 0$.

The following model was used to test the fifth hypothesis:

$$TUOR_{it}= \beta_0+ \beta_1 PERF_{it} + \beta_2 PRIVATE_{it} + \beta_3 COTOROL_{it}+ \beta_4 GOVERN_{it}+ \beta_5 PERF_{it}*PRIVATE_{it}+ \beta_6 GOVERN_{it}*PERF_{it}+ \varepsilon_{it}$$

Testing out the fifth hypothesis: In order to confirm the fifth hypothesis, it is necessary that $\beta 6 \neq \beta 5$).

3.3 Research variables

The objective of this study was to assess the effect of performance on the relationship between corporate governance mechanisms and the probability of CEO turnover. Testing the research hypotheses involved three groups of independent, dependent, and control variables.

1. Independent variables:

Performance: Performance evaluation criteria are divided into internal and external criteria. The ROA and ROE are internal criteria, whereas Tobin's Q ratio is an external criterion. The ROA (Return On Assets) is the return on invested assets and shows the profit earned for every IR Rial invested in assets, expressing the relationship between total investment and profits. The ROE (Return On Equity) is the company's return on net assets. The company's profit can be calculated by this ratio for every IR Rial invested in equities, showing the relationship between earnings and the company's net worth. Tobin's Q ratio represents the ratio of stock market value to its book value, which represents the dividend ratio for each share. In the present study, the return on equity ratio—i.e., the net profit-to-equities ratio—is used [30].

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2. The dependent variable:

The variables of this study include CEO turnover and corporate governance mechanisms and are measured using such criteria as the main shareholder's (blockholder's) ownership, institutional ownership, independent directors, positioning, state ownership, and private ownership.
Replacement of the CEO (turnover): Following the same method as previous studies—for example, Chen and Hambrick [28]— an imaginary variable is introduced which, in the event of CEO turnover, takes a value of 1; otherwise, it remains 0.
Corporate governance: Corporate governance is a regulatory mechanism for supporting stakeholders, especially shareholders, who claim the company's remaining value in the event of bankruptcy. The review of the theoretical issues related to the governance system shows that there is no basic agreement in this regard, and some definitions of institutions or individuals have differences, such that some of them provide a limited view of corporate governance only in the relationship between the firm and shareholders. On the other hand, this concept is defined as a network of relationships, which includes not only the company and its owners (shareholders) but also the stakeholders, including employees, customers, people, and the society [29].

In this research, six criteria were used to assess corporate governance.

- Main shareholder's (Block holders') ownership (BLOCK): In this study, in order to calculate the ownership of a blockholder, the number of shares held by the blockholder is divided by all ordinary shares.

- Institutional ownership: : The percent shares held by institutional (private) entities. In order to measure the extent of institutional ownership, the entire shares held by the banks and insurance companies, holdings, investment companies, retirement funds, capital financing companies, investment funds, government agencies and institutions, and public corporations are divided by all issued shares, obtaining the percent institutional ownership.

- Independent managers: (INDEP) is equal to the ratio of independent executives to the entire board of directors

- Entrenching: If the CEO is the representative of the owners, he/she is a major shareholder (blockholder); otherwise, her share is equal to zero.

- State ownership (GOVER): The percent of government ownership is obtained by dividing the total shares distributed among corporations, banks, organizations, and other state-owned agencies by the total number of shares. In order to calculate this value in each company, the number of institutional shares is divided by the total number of ordinary shares of the company at the end of the period.

- Private ownership: Private ownership is a legal name for the ownership of properties by non-governmental legal entities. Private ownership is distinguishable from public properties, owned by a public entity and from a collective (or cooperative) ownership belonging to a non-governmental group. Private ownership is more distinct from personal property that refers to the properties for personal use and consumption. Private property is a legal concept defined and

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implemented by the political system of the country. Private ownership is a legal concept that refers to companies owned primarily by natural persons. Ahmadpour et al. [30] took this approach, but it is more convenient for others to consider the real owners.

3. Control variables:

- TENURE: is obtained by dividing the number of months that a person works as a CES by twelve.
- Return on Investment (ROI): The following equation yields the RIO: (Dividend + First price - final price) first-period price. Return on Investment (ROI) is a performance measure used to evaluate investment efficiency or to compare the efficiency of different investments.The ROI directly measures the rate of return on a particular investment compared to the investment cost. The ROI is calculated by dividing the return of investment by the investment cost. The result is expressed in the form of a percent or ratio.
- Duty Duality (GM): is a dummy variable, which is 1 when the CEO is also the chairman of the board and 0 when otherwise is true. This variable refers to the division of power between the chairman of the board and CEO [31]. The combination of these two roles weakens the systems of domestic corporate governance for the firms in which the interests are formed between the supervisor (the chairman of the board) and the implementation of the decisions of the board of directors (CEO) [32]. If the CEO is the chairman or vice-chairman of the board, they have a potentially higher authority. Further, the dual structure allows the CEO to effectively control the information available to other members of the board, thus preventing effective oversight. The chairman of the board supervises the CEO. The chairman of the board has the power to control the agenda and conducts the board meetings. The CEO's influence proves problematic in the case of a conflict of interests between them and the shareholders. The CEO's influence does not necessarily weaken the performance, and it is likely to affect the market understanding of the level of control exercised on the performance of the management and the financial reporting process.
- Size: In the present study, the size of a company is calculated by the natural logarithm of the company's sales [33]. This approach was taken to reduce the variance of the variables and to allow for a better representation. The size of the company reflects a competitive advantage, as a larger market share requires higher production and sales. Access to sufficient financial resources helps the company promote its production and marketing, thus achieving a competitive advantage. This variable is calculated from the logarithmic ratio of total assets. The homogeneity of data is due to the use of logarithms.

3.4 Population and sample

The statistical population of this study is the companies listed on the Tehran Stock Exchange from March 21st, 2008 to March 21st, 2016. In this research, systematic deletion and random

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sampling were used. The sample includes all active companies on the Tehran Stock Exchange, provided they satisfy the following conditions: (https://www.seo.ir)

Table 2 Systematic elimination table for all listed companies

Systematic elimination table for all listed companies	578
The number of companies that were not active on the Tehran Stock Exchange on 20-08-2012	194
Companies that did not end their fiscal year on March 21st; or their fiscal year has been changed.	(131)
Financial intermediation companies (Investing, holding, or leasing companies as well as banks)	(77)
Companies that are not active during the stock transactions	(66)
Companies whose information was not sufficient to obtain some research variables	(45)
The total sample according to prerequisites	(65)

3.5 Test methods for research hypotheses

In this study, data were collected using the statistical profile of the stock exchange, the information provided to the Tehran Stock Exchange, the accounting information of the companies listed on the Tehran Stock Exchange, and other relevant sources. According to the research type, descriptive and inferential statistics were used to analyze the information. The descriptive method was used to categorize the different groups of participants in terms of their different traits and describe the characteristics of the statistical population, ratios, measures of central tendency (mean, median) and dispersion indices (range of variation, standard deviation). Then, research hypotheses were tested, relying on the Logistic Regression method, using the Eviwes package.

1. Regression analysis

Regression analysis is a statistical technique to examine and model the relationship between variables. To perform a regression analysis, the analyst needs first to assume there is a relationship between the two variables. In fact, they assume a linear relationship between the two variables and collect quantitative information from two variables, plotting the data on a two-dimensional graph. The regression analysis examines the dependence of a variable (dependent variable) on one or more independent variables (explanatory variable). That is, the second-type variable is determined by estimating or predicting the mean or average values of the first-type variable. Regression analysis is a method of studying the contributions of one or more independent variables in order to predict a dependent variable [34].

2. Logistic regression

The logistic regression is a statistical method for analyzing a dataset in which one or more independent variables determine the result. The result is measured by a two-way variable (with only two possible results). In logistic regression, the dependent variable is dichotomous, that is, it only includes data coded in 1s (TRUE, success, pregnant), and 0s (FALSE, failure, non-pregnant). It is safe to say that the logistic regression is a regression model for two-way dependent variables such as disease or health, and death or life. The model can be considered a generalized linear one that relies on the logit function as a link function with a polynomial error distribution [35]. In several studies, the dependent variable is discrete by nature, which calls for the use of a qualitative regression to estimate the occurrence of each level.

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Regressions with discrete dependent variables have different types, which are determined by the nature of the dependent variable. For a two-dimensional dependent variable, logistic regression is used for prediction. By two-dimensional, it is meant that a random event can take place in two possible situations. For example, buying–not buying, registering–not registering, and bankruptcy–non-bankruptcy, only have two positions, and the sum of their probabilities will eventually be 1. Initially, this method was commonly used for medical applications in order to examine the likelihood of diseases. However, today, it is widely used in all fields of science. For example, an organization manager wants to know which variables have a predicting role in employees' participation or non-participation. The advertising manager wants to know the significant variables when buying or not buying a product or brand so that the possible outcome can be controlled through instructions. Particularly in this research, typical regressions cannot be used to predict the occurrence of these dependent variables. Logistic regression does not require the preconditions for linear regression, such as the linear relationship between independent and dependent variables, the homology of the variance of the dependent variable and independent variables (homoscedastic), and the normal distribution of the dependent variable and the remainders or the measurement error of the model.

4. Evaluation

4.1 Descriptive Statistics

Data analysis is a multi-stage process in which data collected in different ways are summarized, categorized and finally processed to provide a variety of analyses and relationships between data in order to test the hypotheses. In this process, data are refined both conceptually and empirically, and various statistical techniques play a significant role in deduction and generalization. Therefore, based on the materials presented and also the hypotheses, in this section, the descriptive statistics are first described, and then, the collected data are analyzed using the proposed theoretical model and Eviews software.Based on the sample selection criteria, 65 companies listed on Tehran Stock Exchange, active from 2008 to 2016, were selected. Table 3 presents the concepts of descriptive statistics of variables, including mean, median, minimum observations, maximum observations and standard deviations. Means is the main parameter of central tendency, which represents the equilibrium point and distribution center; and it is a good indicator of data centrality. Standard deviation is one of the most important parameters of dispersion and a criterion for the extent of the diffusion of observations from the mean.

Table 3 Descriptive statistics variables

Variables	Variable symbol	Mean	Standard deviation	Skewness	Elongation	Minimum	Maximum
Performance	PERF	0.408	0.767	0.488	86.167	-9.56	5.65
CEO change	TOUR	0.266	0.442	-1.58	-0.884	0.00	1.00
Independent directors	%INDEP	0.628	0.187	-0.17	-0.183	0.20	1.00
Positioning	ENTRENCH	0.275	0.447	1.009	-0.985	0.00	1.00

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Majority ownership	BLOCK	0.484	0.219	-0.033	-0.328	0.92	2.01
Institutional ownership	MAJOR	0.350	0.309	0.709	-0.949	0.00	0.97
Private property	PRIVATE	0.323	0.113	4.223	17.987	0.00	0.68
State ownership	GOVERN	0.092	0.182	2.147	3.774	0.00	0.88
Company Size	SIZE	26.819	1.525	0.351	-0.139	22.71	31.02
Return	RETURN	26.580	59.939	2.597	10.746	-58.48	452.07
Term time	TENURE	3.280	3.678	3.080	13.729	0.00	27.50
Duality duty	GM	0.005	0.071	13.892	191.650	0.00	1.00

Table 3: the table shows that the maximum and minimum values of the main shareholder's (blockholder's) ownership variable are 2.01 and 0.92, respectively. The maximum and minimum values of the CEO's duty duality are also 1 and 0, respectively. The average institutional ownership is 0.35%, indicating that individual investors still dominate the stock market in Iran. The average value of CEO change is 0.266. In general, the results show that the average of dependent variables in the study period is positive, indicating that companies are growing in the course of the study period.

4.2 Inferential statistics

The results of testing the general research hypothesis are presented in the following tables. The logistic regression technique was used to test the hypothesis. Generally speaking, logistic regression techniques are used to compare the performance of several different models or the goodness of fit of a particular statistical model with that of others.

Table 4 Table bracket prediction model research

	Percent forecast models generally	**Percent correctly predicted the CEO**	**The percentage of correct predictions unchanged CEO**	**Predicted the CEO and the CEO**	**Predicted the CEO and the CEO**	**Predicted no change in the CEO and the CEO**	**Anticipate no change and no change Managing Director**
First hypothesis	96.21	97.61	96.19	141.35	14.65	16.34	412.66
Second hypothesis	96.21	97.61	96.19	141.35	14.65	16.34	412.66
Third hypothesis	96.21	97.61	96.19	141.35	14.65	16.34	412.66

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Fourth hypothesis	95.17	96.38	95.12	136.32	19.68	20.92	408.08
Fifth hypothesis	96.43	97.30	94.51	134.62	21.38	23.55	405.45

The results presented in this table are used to determine the model's power in classifying individuals in dependent variable classes. The table contains information on the validation of the model and sensitivity analysis. For example, the sensitivity value for the first hypothesis is 97.61%, and the measure is calculated at 96.19%. In general, the overall accuracy of the model for the first hypothesis is 96.21%. That is, the dependent variable variations can be explained with 96% confidence using the independent variable in the first hypothesis. The highest range corresponds to the fifth hypothesis and the lowest to the fourth one.

Table 5 statistical output of the research hypothesis

	Coefficients					**Z statistic significant level**				
	First hypothesis	Second hypothesi	Third hypothesis	Fourth hypothesis	Fifth hypothesis	First hypothesis	Second hypothesis	Third hypothesis	Fourth hypothesis	Fifth hypothesis
Constant	1.912	1.912	1.912	2.888	4.982	0.3074	0.3074	0.3074	0.1539	0.0265
Performance	-0.417	-0.417	-0.41	-0.5086	-0.363	0.000	0.000	0.000	0.0000	0.0000
Institutional ownership	1.914			0.8515		0.000			0.0115	
Majority ownership		0.733		0.1096			0.000		0.0080	
Independent directors			-2.929					0.000		
Positioning				-0.9992					0.0002	
Private ownership					1.334					0.0000
State ownership					-6.46					0.0102
X performance majority ownership	-0.609			1.075		0.019			0.0110	
X performance the Independent directors		1.474		0.5048			0.0001		0.0000	
X performance Institutional ownership			-0.510					0.0082		
X performance Positioning				-0.1583					0.0006	
X performance of private property					-1.707					0.0000
X performance of state ownership					-4.830					0.0002

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Term time	-1.308	-1.308	-1.308	-1.627	-1.525	0.013	0.013	0.013	0.0051	0.0136
Company Size	-0.012	-0.012	-0.012	-0.075	-0.131	0.842	0.842	0.842	0.2458	0.0694
Company returns	0.007	0.007	0.007	-0.0002	.97	0.593	0.593	0.593	0.883	0.9979
Duality duty	1.433	1.433	1.433	0.230	1.479	0.172	0.172	0.172	0.147	0.2018
The coefficient of determination Mac Fowden	0.835	0.835	0.835	0.7908	0.770					
Let indicators show significant level	0.251	0.251	0.251	0.0985	0.256					
The significant level of likelihood ratio tes	0.000	0.000	0.000	0.000	0.000					

Table 5 presents the logistic regression analysis results for the studied model. The determination coefficient is the most important criterion that can explain the relationship between independent and dependent variables. This indicator represents the percentage of changes reported by the regression model. In other words, this indicator shows the amount of compatibility of predicted values for the dependent variable with actual values. We also know that for a Z that is smaller than 5%, the model is said to be significant at a 95% confidence level, and there is a significant relationship between the independent and dependent variables. Since the z value for all hypotheses is less than 5%, the results from the above table show that institutional ownership and ownership of the major shareholder (blockholder), as well as private ownership, have a significant positive relationship with CEO turnover. State ownership, independent directors, and managerial positions have a significant negative relationship with CEO turnover. All hypotheses are confirmed based on the table and corresponding z values. However, as far as their impact is concerned, it is safe to say that according to the test results, firm performance has a significant negative effect on the relationships of independent managers and position stabilization with CEO turnover. However, a positive effect was found for major ownership and institutional ownership. In addition, the results show that firm performance has a significant negative effect on the relationship between ownership (private and public) and CEO turnover. However, the effect of private ownership is more subtle than public ownership.

Table 6 Wald test

Significance level	Degree of freedom	Value	Test
0.0000	1.577	11.636	Test F

The Wald statistic is the most important statistic for testing the significance of any independent variable in the model, which can be figured out by its significance level (sig).

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Further, the Wald parameter is equivalent to the t statistic in the linear regression. In the interpretation of the Wald statistic results, it is said that if the statistic is significant for any variable at an error level of below 0.05, it is concluded that the variable is useful to the model and has a significant effect. The results show that with respect to the significance level of less than 5%, the performance has an effect on the relationship between corporate governance mechanisms and CEO turnover.

5 Conclusion

Several researchers have shown that corporate executives are responsible for the success or bankruptcy of companies due to the establishment of a representation relationship and enjoying absolute authority. Considering the recent failures of large companies, most of which arise from poor management, this study aimed to assess the impact of performance on the relationship between corporate governance mechanisms and potential CEO turnover in the companies listed on the Tehran Stock Exchange. The results showed that firm performance has a significant negative effect on the relationships of independent managers and the CEO position with CEO turnover. However, a positive effect was observed for the major ownership and institutional ownership. In addition, the results show that performance has a significant negative effect on the relationship between ownership (private and public) and CEO turnover. The impact of private ownership is more subtle than that of state ownership. The results also showed that major shareholder's ownership, institutional ownership, and private ownership have a positive and significant relationship with CEO turnover; and, besides, state ownership, independent directors, and the position of the manager have a negative relationship with CEO turnover. Regarding the effect of control variables, the results also showed that the size of the company and the duration of maintenance had a negative effect on the relationship between the performance, corporate governance mechanisms, and CEO turnover. However, the variables of duty duality and returns had a positive effect on this relationship. Dora and Meller argued that management dichotomy (duality) reduced the performance of a company through managerial interference that was not consistent with the study results. Chang and Sun hold that the duality of the CEO's duty can compromise the board of directors' integrity in monitoring financial reports and affect corporate governance adversely. Magneson and Ernson stated that the position of the company's CEO has a positive and significant effect on the relationship between firm performance and CEO turnover.

Based on the results of the present and past research, CEOs are advised to examine and seize investment opportunities carefully, for example, by the timely purchases of long-term assets, using new technologies, and using untapped capacities to help improve the company's performance, thus reducing their chances of turnover. Further boards of directors are encouraged to become more acquainted with the models and methods by which a company's performance is evaluated and participate in decision making about the replacement of the CEO. Further, given the importance of the CEO and its impact on capital market participation, particular attention must be given to CEO turnovers. The efficiency of a company is to be evaluated based on its performance in the industry, as it allows for comparing its performance against the industry, thus providing a firmer grasp of the company's progress. Further, a review of the impact of changes in the ownership of existing shareholders and major shareholder (blockholder) in the new company with the CEO is suggested. It is also recommended that the managerial incentives are mentioned in future studies, as the CEO may be replaced voluntarily. Information about the CEO, the company,

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and the nature of CEO turnover (voluntary, compulsory, retirement, or else) have not been published. Therefore, they can be separated to achieve better results in future studies. This study is based on disclosed information, so the quality of information depends on the quality of disclosed information. The ensuing constraints are the unfulfillment of performance criteria, such as market performance and social performance, for non-government actors based on market performance.

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