

## CEO Power, Corporate Risk-Taking, and the Role of Institutional Owners: Pieces of Evidence of Tehran Stock Exchange Market and Iran Fara Bourse

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### Abstract

"Corporate governance" includes mechanisms to monitor CEO's performance to assure efficient decision adoption and maximize firm value. One of the most effective aspects of firm performance is the degree of risk-taking. This study investigates the relationship between CEO power and institutional ownership with risk-taking behavior of member firms of Tehran Stock Exchange and Iran Fara Bourse during 2010-2019 by utilizing quintile regression. According to

the results, by the increase of CEO's power and the company's benefit from powerful managers, the company risk (total risk and systemic risk) will decrease. As a result, managers are eager to safeguard their reputation as expert decision-makers and, as a result, they try to reduce company risk. In addition, the existence of institutional ownership among the shareholders of the company will reduce the risk, which can be referred to in the agency theory. Also, if the impact of these two variables is considered together, the risk will increase significantly. This very fact reflects the exercise of the power and influence of institutional owners. As a result, large shareholders have a supervisory role in the discipline of managers, but despite their impact on the relationship between managers' power and corporate risk, they do not alter the main negative relationship.

**JEL Classification:** G10, G30, G32, G34

**Keywords:** CEO power, institutional ownership, risk-taking, Exercising influence and power

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## Introduction

Risk is an integral part of all business activities and its effective management not only helps firms to prevent financial problems and capital budgeting but improves the decision-making process. In fact, risk-taking has an important role in maintaining the competitive advantage of the firms and can lead them to economic growth. In a competitive setting, firms follow different strategies so that they can increase their shares in the market and create obstacles for others to enter. Strategy adoption requires various levels of risk acceptance and affects firms risk-taking differently. While certain business strategy adoptions will reduce firm vulnerability against macro-economic volatility and help firm systematic risk, on the other hand, the mentioned strategies can help to increase firm-specific risk, as well (Nguyen, 2011).

In certain organizations, the CEO takes all important decisions, while in other organizations, the final decisions are the result of group decision making which includes the CEO and other managers. Group decision making and organizational theory indicate that individual decisions have more risk-taking features while the results of group decision making are less riskier due to

diversity of thoughts. Therefore, it is expected that in organizations in which the final result is the product of CEO judgement, the results lead to more risks. Given that, such a case highly depends on the influence of the CEO on the decision-making process (Liu & Jiraporn, 2010).

Given the stated matters, by investigating the relationship between CEO power and institutional owners more accurately, this study attempts to answer the following question: "what relationship exists between CEO power and institutional ownership with firms risk-taking behavior?"

It is worth mentioning that regarding the topic under investigation, studies have been conducted, but given the investigations, it became obvious that limited foreign studies have been conducted by considering key variables for formulating CEO power and investigating its relationship with the firm risk-taking behavior. Also, no similar study has been conducted in Iran so far and the present study is leading research in this regard. Therefore, the results of the present study in addition to filling the research gap in this domain can be beneficial to the decision making process of investors, creditors and other stakeholders. Along with investigating the above issue, this study is structured below: Section 2 investigates the conducted studies regarding the research topic. In section 3 we deal with research methodology and designing questions and models. In section 4, we answer the study question by using data analysis and estimating study models. In section 5 we present the conclusions and recommendations to develop the study for future research.

## Literature Review

In order to be influential and effective, leaders need various instruments. power is one of their efficient tools. What matters the most in leadership, is the process of exerting power on others. The way to use influence and power is called the " leadership style". Influencing others is realized by creating a powerful image and creating this image entails accessing power resources. Most large shareholders have a lot of financial resources and fiducial responsibility to their clients. The existence of large shareholders assure minority shareholders that disclosed information by firms clearly show the financial situation of the firms and their wealth is being protected against management manipulations( Ayazi & Eslami, 2019). Therefore, due to the amount of their shareholding, large shareholders have more motivation to monitor CEOs and have more power to make influential decisions. Also, they can affect the operational decisions of the firms by monitoring managers and help to the betterment of investment level and reduction of resource waste

(Becker, Cronqvist & Fahlenbrach, 2011).

On the other hand, the separation of CEO position and board of directors is a requirement of an efficient corporate governance system and causes independent and proper assessment of CEOs by the board of directors and improvement of monitoring and supervision mechanisms in the firm (La Porta, Lopez-de-Silanes & Shleifer, 1999). On the contrary of the mentioned arguments regarding disagreement of CEO duality, a new branch of literature will be shaped which contends that separation of responsibilities causes reduction of the decision-making process of the CEOs and their disconformity with the board which weakens firm performance (Malekian & Shayeste Mand, 2016).

CEO tenure is of other effective factors on CEO position and disturbing power balance in the board of directors. The longer tenure period will lead to a more stabilized position and more power in the decision-making process and less efficient monitoring by the board of directors. Therefore, if there is no proper alignment between CEO and shareholders benefits, the undesirable effects of agency problems will arise and investors benefits will be at risk (Malekian & Shayeste mand, 2016). Also, from the perspective of agency theory, non-executive directors in boards and their monitoring function as independent bodies will help to reduce conflict of interest between shareholders and CEOs in board meetings. Non-executive managers judge CEOs decisions unbiasedly. Thus, by having expertise, independence and legal power, boards will be an efficient potential mechanism (Marrakchi, Jean & Lucie, 2004). Women as members of the board tend to choose less risk-taking premiums comparing men who are more risk-takers. In fact, psychological and experimental literature have pieces of evidence of gender differences in risk tolerance and prominence (Bahrami, 2017). Unexperienced members in accounting and financial knowledge have fewer skills in discovering financial reporting problems. Therefore, an experienced member will cause awareness in other members (Nikbakht, Seyedi, & Hashem Alhosseini, 2010). Following, certain foreign and inside studies dealing directly or indirectly with the present study will be mentioned.

In research, Pathan (2009) deals with an efficient board, CEO power and bank risk-taking behavior. According to the results of this study, boards of banks, especially small banks influence positively on banks risks. On the contrary, CEO power (CEO power to control board decisions) negatively influences banks to risk-taking behavior.

Abbasi & Ahmadi (2011) investigated the relationship between

governance and institutional investors in boards with the firm value. In order to analyze data and test hypotheses, multiple linear regression was used during 2001-2009 in the Tehran stock exchange market. The results indicate a significant and positive relation between institutional ownership and the degree of institutional investors presence in boards and firm value.

Abdul Rahman & Zaki Nik (2011) investigated the effect of board characteristics on earnings management and risks during 2003- 2009 in the Malaysian stock market. The criterion of board characteristics in this study includes financial knowledge, number of meetings, non-duality of the roles, board composition, and the size of the board. According to the results of this study, CEO duality has a significant effect on earnings management reduction and risk reduction comparing other variables.

In a study for evaluating the level of risk-taking behavior, Mc Nulty, Florackis & Armrod (2012) used a different criterion. They considered low-risk firms as firms with high cash and cash equivalents during financial crises and high-risk firms as those who used cash reserves immediately. According to their results, there is a direct relationship between board size and firm risk-taking behavior. On one hand, the number of non-executive managers and risk committee has no significant relationship with risk-taking behavior. Also, risk-taking behavior will be reduced while executive membership is significantly higher than non-executive membership on board.

Chen & Zheng (2014) investigated CEO responsibility and firms risk-taking behavior in the S&P index from 1992 to 2006. According to their results, CEO tenure has a positive effect on firm risk-taking.

Eling & Marek (2014) investigated the relationship between corporate governance and the risk-taking of insurance firms in England and Germany. According to their results, there is a reverse relationship between governance components, e.g. CEO compensation, non-executive members and the number of meetings, with risk-taking.

Nikbakht & Taheri (2014) research investigated the relationship between corporate governance mechanisms and systematic risk in the Tehran stock exchange market during 2004-2011. The results indicate that there is a significant relationship between the percentage of institutional shareholders who are a component and mechanism of corporate governance and systematic risk. Also, there is no relationship between the percentage of non-executives and systematic risk in general and other levels of the firm.

Nikpour (2014) investigated the relationship between corporate

governance and financial, operational and environmental risk in accepted firms in the Tehran stock exchange market. The results indicated that there is no significant relationship between certain corporate governance indices (e.g. board size, the proportion of non-executive managers and the number of board meetings) with financial, operational and environmental risk but there is a significant relationship between firms with strong and weak governance.

Serfling (2014) in a study examined CEO age and risk-taking of the firm policy. According to the results of this study, CEO age can have a significant effect on firm risk-taking behavior and performance.

Toutchi (2014) investigated the effect of board diversity on financial reporting quality in accepted firms of the Tehran stock exchange market during 2009-2013. The results indicate that there is a positive and significant relationship between board size and board independence with financial reporting quality and there is a positive and significant relationship between financial knowledge of board and firms risk and there is no significant relationship between boards field of studying and their occupational background and their financial knowledge with financial reporting quality. Also, there is no relationship between board size and board independence and their field of studying and their occupational background with firm risk-taking behavior.

In a study, Haider & Fang (2016) investigated the board size, ownership concentration and future risk of the firm. They found that when future price volatility and future cash flows are measured, board size will have a relation with the future risk. Second, large shareholders impress management decisions about future risk, regardless of board size. Third, the moderating role of ownership concentration in state and non-state firms is trivial.

In a study, Mahmood Abadi & Zamani (2016) by focusing on corporate governance mechanisms investigated the relationship between firms risk-taking behavior and their financial performance in the Tehran stock exchange market during 2005-2012. The results indicate that the firms' risk-taking extent has a positive and significant relationship with their financial performance. The percentage of independent members of the board has a negative and significant effect on the extent of risk-taking but the percentage of institutional shareholders ownership and the number of the board has no significant relationship with the extent of risk-taking. Regarding the effect of board structure and institutional ownership on the relationship between risk-taking and financial performance, the results indicated that independence, size, and the percentage of institutional ownership of a firm has a positive effect on the

relationship between risk-taking behavior and financial performance which supports this relationship.

Malekian & Shayeste Mand (2016) investigated the effect of corporate governance managerial mechanisms, e.g. board and CEO characteristics on risk-taking of the member firms during 2008-2013. According to their results, the size and independence of the board and CEO influence is effective on firms risk-taking behavior but there is no relationship between CEO tenure and the duality of role and risk-taking.

In a study, Bahrami (2017) investigated the relationship between board gender and capital allocation efficiency with the risk-taking behavior of the accepted firms in the Tehran stock exchange market during 2013- 2016. The results indicate that there is no significant relationship between women CEOs in boards and efficiency of capital allocation with the risk-taking behavior of the examined firms.

In a study, Parvan, Ramzanpoor and Gholizade (2017) investigated the effect of corporate governance mechanisms on the risk-taking behavior of the accepted firms of the Tehran stock exchange market. Corporate governance mechanisms include a percentage of institutional shareholders of a firm, ownership concentration, CEO tenure and CEO duality. The results indicate a positive and significant relationship between ownership concentration, CEO tenure and dependent variables, e.g. financial and cash flow risk. The results of the mentioned study do not support a significant relationship between CEO duality and financial and cash flow risk.

In a study, Haider and Fang (2018) investigated CEO power, firms risk-taking behavior and the role of large shareholders. Their results indicated that CEO power has a negative relationship with firm risk-taking behavior. Second of all, large shareholders influence this relation significantly. But the initial negative relationship between CEO power and firm risk-taking behavior is not altered. Also, the relationship between CEO power and firms risk-taking behavior is different in state and non-state firms.

In a study, Ayazi & Eslami (2019) investigated the relationship between CEO power and risk-taking behavior of the accepted firms in the Tehran stock exchange market during 2012- 2017. According to their results, there is a significant relationship between CEO power and the risk-taking behavior of a firm.

## Research Methodology and Research Findings

The present study is applicable in terms of purpose and descriptive in terms of nature and methodology since it investigates the relationship between CEO power and institutional ownership with the risk-taking behavior of accepted firms of the Tehran stock exchange market. Data were collected daily, monthly and annually by using the Codal site and Rahavard Novin software. In order to classify and analyze data, Excel, Eviews 8 software and the quintile regression method were used for model fitness.<sup>1</sup>

Accepted firms in the Tehran stock exchange market were considered as statistics population. In order to sample, a purposeful sampling method (systematic removal) was utilized. For this purpose, all firms of statistics population with the following qualifications were chosen as a sample and the rest were deleted:

- They should be accepted in Tehran Stock Exchange and Iran Fara Bourse before 2010 ends.
- Their financial period shall end on March 19<sup>th</sup>.
- No financial change shall occur during the study period (2010-2019).
- Their required information and data shall be accessible in all investigated years in the financial year-end.
- During the investigation period, the symbol of the firm shall not be pending over 4 months each year, also during each month under investigation, trading days shall be more than or equal to 9 days and shall not be a member of the UTP Market (Red) of Fara Bourse. 2

By applying the above-mentioned conditions from accepted firms in Tehran Stock Exchange and Iran Fara Bourse, 107 firms were selected as statistic samples in this research (Refer to appendix).

### 1. Research model and variables

In the present study, according to Hideger & Fang (2018) CEO power was obtained by applying the principal component analysis (PCA) technique. In

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<sup>1</sup> Because simultaneous attention to the general set of estimated quintiles will provide a more comprehensive idea regarding the effect of auxiliary variables on location, scale and the form of distribution of response variable.

<sup>2</sup> With the change in the rules, UTP Market (j) was removed from the OTC market list, and UTP Market (Red) has been used instead of UTP Market (j) in research. Since there are just three trading days in UTP Market (j) of Fara Bourse during the week, the number of observations of the member firms is half of the member firms of the statistics population and is not comparatively strong, as a result, it is ignored in statistics population.



order to investigate it accurately, 3 indices of risk were calculated as risk developing variables, then 3 regression models were used, such that in model 1, the relationship between CEO power and institutional ownership with general risk of firms, and in model 2, the relationship between CEO power and institutional ownership with a specific risk of the firms and in model 3, the relationship between CEO power and institutional ownership with systematic risk of the firms were dealt.

$$\begin{aligned} \text{[Total Risk]}_{it} = & \alpha_0 + \beta_1 \text{CEOP}_{(i,t-1)} + \beta_2 \text{[Bord Size]}_{(i,t-1)} + \beta_3 \text{[Indp. Directors]}_{(i,t-1)} + \\ & \beta_4 \text{[Ownership Concentration]}_{(i,t-1)} + \beta_5 \text{[Managment Shareholding]}_{(i,t-1)} + \beta_6 \text{ROA}_{(i,t-1)} + \\ & \beta_7 \text{Leverage}_{(i,t)} + \beta_8 \text{Size}_{(i,t-1)} + \beta_9 \text{Capex}_{(i,t-1)} + \\ & \beta_{10} \text{Cashflow}_{(i,t)} + \beta_{11} \text{[M/B]}_{(i,t-1)} + \beta_{12} \text{AGE}_{(i,t-1)} + \\ & \beta_{13} \text{[CEOP\_OWNERSHIP]}_{(i,t)} + \\ & \beta_{14} \text{[CEOP\_OWNERSHIP\_SOE]}_{(i,t)} + \beta_{15} \text{INDUSTRY}_{(i,t)} + \varepsilon_{(i,t)} \end{aligned}$$

$$\begin{aligned} \text{Specific Risk}_{it} = & \alpha_0 + \beta_1 \text{CEOP}_{(i,t-1)} + \beta_2 \text{[Bord Size]}_{(i,t-1)} + \beta_3 \text{[Indp. Directors]}_{(i,t-1)} + \\ & \beta_4 \text{[Ownership Concentration]}_{(i,t-1)} + \beta_5 \text{[Managment Shareholding]}_{(i,t-1)} + \beta_6 \text{ROA}_{(i,t-1)} + \\ & \beta_7 \text{Leverage}_{(i,t)} + \beta_8 \text{Size}_{(i,t-1)} + \beta_9 \text{Capex}_{(i,t-1)} + \\ & \beta_{10} \text{Cashflow}_{(i,t-1)} + \beta_{11} \text{[M/B]}_{(i,t-1)} + \beta_{12} \text{AGE}_{(i,t-1)} + \\ & \beta_{13} \text{[CEOP\_OWNERSHIP]}_{(i,t)} + \\ & \beta_{14} \text{[CEOP\_OWNERSHIP\_SOE]}_{(i,t)} + \beta_{15} \text{INDUSTRY}_{(i,t)} + \varepsilon_{(i,t)} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Systematic risk}_{it} & = \alpha_0 + \beta_1 \text{CEOP}_{i,t-1} + \beta_2 \text{Bord Size}_{i,t-1} + \beta_3 \text{Indp. Directors}_{i,t-1} \\ & + \beta_4 \text{Ownership Concentration}_{i,t-1} \\ & + \beta_5 \text{Managment Shareholding}_{i,t-1} + \beta_6 \text{ROA}_{i,t-1} \\ & + \beta_7 \text{Leverage}_{i,t} + \beta_8 \text{Size}_{i,t-1} + \beta_9 \text{Capex}_{i,t-1} \\ & + \beta_{10} \text{Cashflow}_{i,t-1} + \beta_{11} \frac{M}{B}_{i,t-1} + \beta_{12} \text{CEOP\_OWNERSHIP}_{i,t} \\ & + \beta_{14} \text{CEOP\_OWNERSHIP\_SOE}_{i,t} + \beta_{15} \text{INDUSTRY}_{i,t} + \varepsilon_{i,t} \end{aligned}$$

The definition and calculation method of the variables in the present study has been presented in table 1.

Table 1. Variable definition

variable	definition
Total risk	The standard deviation of stock daily return for each year
Specific risk	The residual standard deviation of the Three-factor model by Fama & French will be clarified in the following section.
Systematic risk	Total risk minus the specific risk
CEOP	The principal component analysis will be clarified in the following section.
Board size	The number of board of directors.
Indp. Directors	The number of non-executive managers divided by executive managers
Ownership concentration	The share percentage belonging to 5 blockholders with over 5% ownership
Management shareholding	Percentage of shares belonging to CEO
ROA	Net profit divided by asset
Leverage	Total debt divided by total asset
Size	natural logarithm of Assets
CAPEX	(amortization plus fixed assets) divided by total assets.
Cash flow	(operational earnings plus amortization minus tax) divided by income
Market-to-Book	Market value divided by book value
AGE	the logarithm of the years since Firm establishment
SOE	If the government owns 30% of the shares, it equals 1, otherwise 0.
Ceop*ownership	CEO power multiplied by institutional ownership
Ceop*ownership*seo	CEO power multiplied by institutional ownership and state firms.
Industry	Two-digit industry code

**CEO power:** In order to calculate this variable by developing the studies of Haiderger & Fang (2018) and by using the PCA technique, 13 components were used to develop CEO power. The variables are presented in Table 2.

Table 2. components used for calculating CEO power

Power structure	Variables	Definition
Structural power	Duality	If CEO and chairman are the same=0, otherwise 1.
	Inside management	If CEO is on board =0, otherwise 1.
	Independence	If the number of non-executive managers is higher than the average of industry =1, otherwise 0.
Ownership power	CEO shareholding	If CEO is a shareholder=1, otherwise 0.
	Large shareholders	If shareholders ownership is higher than average of industry =1, otherwise 0.
	Institutional ownership	If among percentage shareholders, percentage of legal entity is higher than natural person =1, otherwise 0.
Expertise power	Expertise	If CEO field of study is related to the job =1, otherwise 0.
	Education	If CEO has a master degree or above=1, otherwise 0.
	Analytical skills	If the CEO field of studying is financial and economic sciences=1, otherwise 0.
Credit or influencing power	Experience	If CEO tenure is above industry average=1, otherwise 0.
	Outside service	If CEO serves on other firms board=1, otherwise 0.
Social power	Tenure duration	If CEO tenure is over one year=1, otherwise 0.
	Gender	If CEO is a man 1, otherwise 0.

It is worth mentioning that the required data for calculating CEO power have been extracted from the notes of the financial statements in different years and certain cases, they have been compared with the available data in financial statement notes of other available firms in the same industry.

**Specific risk:** to calculate this variable, Fama & French three-factor model (model 4) was fitted monthly by using daily data and following that, the residuals were extracted. In the end, standard deviations of the residuals were calculated for each year and were considered as a specific risk.

$$\text{Relation 4) } R_{it} - R_f = \alpha_i + \beta_i(RM_t - R_f) + \beta_i(HML) + \beta_i(SMB) + \varepsilon_{i,t}$$

Where ( $R_i$ ) is the stock monthly return of the considered firm during the investigation period, ( $R_f$ ) is the risk-free return which equals a one-year deposit return rate announced by the central bank of the Islamic Republic of Iran, ( $RM_t$ ) is the monthly return during the period under study, ( $HML$ ) is the excess return of value stocks to growth stock, ( $SMB$ ) is the historic return of stock excess with low capital comparing high capital.

### Data analysis and estimation models

Descriptive statistics: before data analysis, descriptive statistics of the variables, e.g. mean, standard deviation, median, maximum and minimum are presented in table 2.

Table 3. descriptive statistics

variable	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis
Total Risk	2.48	2.48	5.826	0.421	0.875	0.627	4.078
Idiosyncratic Risk	0.135	0.121	0.509	0.034	0.067	1.614	6.983
Systematic Risk	2.345	2.338	5.688	0.368	0.843	0.653	4.163
Ceop	0.000	-0.258	5.089	-2.387	1.393	0.907	3.303
Board Size	5.067	5	8	3	0.379	4.149	29.651
Indp. Directors	0.666	0.6	1	0.000	0.177	-0.396	3.119
Ownership Concentration	0.753	0.81	0.982	0.000	0.186	-1.284	4.424
Management Shareholding	4.424	0.000	91.314	0.000	15.909	3.975	18.181
ROA	12.555	10.656	63.134	-58.331	14.021	0.415	4.91
Leverage	0.57	0.586	2.665	0.013	0.22	1.055	12.863
Size	14.282	14.11	19.774	10.952	1.498	0.756	3.95
CAPEX	0.045	0.023	0.903	-0.434	0.089	3.866	28.55
Cash Flows	0.234	0.184	3.724	-1.313	0.275	2.586	33.926
Market-to-Book	1.383	1.066	12.5	0.032	1.203	2.989	19.016
Ln_age	38.411	41	67	6	14.731	-0.246	1.859

Source: research findings

Regarding table 4 and the statistics of general, specific risk and systematic risk, it can be mentioned that systematic risk shapes the majority of general firm risk which is the result of political and exerted sanction on Iran during years and by considering that general risk has been calculated from the standard deviation of each share, it can be said that outliers and positive skewness and kurtosis of the distribution can be the result of the high volatility of certain firms for different reasons e.g. inflation, speculation etc.

**A normality test:** In order to use quintile regression, the non-normality of the data must be proved first. As you can see in table 4, given the significance of Jarque– Bera statistics in all variables, the null hypothesis which indicated normality, will be rejected. Therefore, all variables have a non-normal distribution.

Table 4. normality test of the variables.

variable	Jarque-Bera	Probability	Observations
Total Risk	109.761	0.000	963
Idiosyncratic Risk	1054.776	0.000	963
Systematic Risk	122.607	0.000	963
Ceop	135.832	0.000	963
Board Size	31229.082	0.000	962
Indp. Directors	25.713	0.000	962
Ownership Concentration	346.139	0.000	963
Management Shareholding	11782.952	0.000	963
ROA	173.977	0.000	963
Leverage	4082.133	0.000	963
Size	127.995	0.000	963
CAPEX	28591.73	0.000	963
Cash Flows	39450.001	0.000	963
Market-to-Book	11726.881	0.000	963
Age	160.745	0.000	963

Source: research findings

Given the stated issues, the best method to estimate the model is quintile regression since in this method quintiles are used rather than means.

**Static test:** In econometrics, the static test is used to avoid regressions with fake relations. If data are not static, it is not possible to use them in regression and rely on the results. To measure static variables, Levin, Lin & Chu t, Im, Pesaran and Shin, ADF– Fisher and PP– Fisher tests were used.

Table 5. static test results

variable	Levin, Lin & Chu t		Im, Pesaran and Shin W-stat		ADF - Fisher Chi-square		PP - Fisher Chi-square	
	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob
Total Risk	-10.094	0.000	-3.489	0.000	295.773	0.000	605.391	0.000
Idiosyncratic Risk	-15.806	0.000	-5.751	0.000	370.241	0.000	668.601	0.000
Systematic Risk	-10.783	0.000	-3.698	0.000	304.378	0.000	611.833	0.000
Ceop	9.995	1.000	-0.295	0.384	251.352	0.033	439.188	0.000
Board Size	-3.351	0.000	-1.511	0.065	30.994	0.029	78.781	0.000
Indp. Directors	-127.32	0.000	-12.588	0.000	258.421	0.000	391.270	0.000
Ownership Concentration	-4.134	0.000	-6.239	0.000	400.609	0.000	780.627	0.000
Management Shareholding	-564.80	0.000	-175.70	0.000	183.376	0.000	338.944	0.000
RoA	-34.093	0.000	-7.054	0.000	397.633	0.000	538.050	0.000
Leverage	-11.710	0.000	-3.562	0.000	312.515	0.000	636.967	0.000
Size	-40.155	0.000	-4.456	0.000	297.791	0.000	435.083	0.000
CAPEX	-7.420	0.000	-6.996	0.000	411.049	0.000	1100.39	0.000
Cash Flows	-18.287	0.000	-4.081	0.000	338.501	0.000	495.446	0.000
Market-to-Book	-13.677	0.000	-4.305	0.000	342.885	0.000	576.107	0.000
Age	-70.258	0.000	-519.70	0.000	1977.80	0.000	1971.01	0.000

Source: research findings

According to table 5, investigating the statistics value and probabilities indicate that all variables are static. Therefore, it should be mentioned that regarding the results of Im, Pesaran and Shin tests for CEO power and board size, we should rely on the results of other tests, because according to the results, other tests used for the above-mentioned variables are static.

**Estimating models:** as was mentioned before, in this study, we seek to investigate and analyze the relationship between CEO power and institutional ownership with the change of risk behavior of firms and quintile regression has been used to estimate models. It is worth explaining that when quintile regression is approximated 10%, the effect of variables will be tested on periods or firms with conservative policies in risk management. Accordingly, simply say, 10%, 30%, 50%, 70%, 90% quintiles are labeled as firms with very low, low, average, high, and very high risk, respectively.

Table 6. fitness results of model 1( dependent variable: general risk of the firm)

Quintile regression	%10	%30	%50	%70	%90
Variable	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)
C	4.089 (6.656)***	4.109 (7.479)***	4.383 (10.343)***	4.268 (6.811)***	3.352 (2.808)***
Ceop	-0.079 (-1.583)*	-0.113 (-3.563)***	-0.095 (-3.217)***	-0.075 (-2.438)**	-0.176 (-3.072)***
Board size	-0.025 (-0.287)	-0.033 (-0.322)	-0.02 (-0.325)	-0.013 (-0.161)	0.004 -0.033
Indp. Directors	-0.034 (-0.113)	0.052 -0.265	0.12 -0.81	-0.042 (-0.215)	-0.373 (-0.734)
Ownership concentration	-0.879 (-3.616)***	-0.638 (-3.482)***	-0.744 (-5.434)***	-0.473 (-2.936)***	-0.273 (-0.657)
Management shareholding	0.006 (3.315)***	0.003 (1.759)**	0.002 (1.434)*	0 -0.209	-0.001 (-0.150)
ROA	-0.013 (-2.375)**	-0.015 (-4.249)***	-0.013 (-3.010)***	-0.01 (-2.434)**	-0.013 (-1.517)*
Leverage	0.608 (1.588)*	0.497 (2.306)**	0.531 (2.493)**	0.503 (2.623)***	0.957 (3.000)***
Size	-0.044 (-1.397)*	-0.063 (-2.056)**	-0.073 (-3.402)***	-0.083 (-3.815)***	-0.067 (-1.567)*
CAPEX	0.84 (3.417)***	0.201 -0.885	-0.164 (-0.796)	-0.445 (-1.641)*	0.337 -0.456
Cash Flows	-0.116 (-0.947)	-0.109 (-0.559)	0.075 -0.286	0.098 -1.241	0.259 -0.765
Market-to-Book	0.077 -0.839	0.067 (1.634)*	0.129 (2.950)***	0.158 (2.624)***	0.462 (5.010)***
Age	-0.335 (-4.302)***	-0.154 (-2.568)**	-0.124 (-2.301)**	-0.026 (-0.475)	0.171 -1.311
Ceop*Ownership	0.171 (2.859)***	0.17 (3.617)***	0.14 (3.727)***	0.107 (2.458)**	-0.012 (-0.200)
Ceop*Ownership*Soe	0.123 (1.675)*	0.054 -1.01	0.048 -0.987	0.028 -0.554	0.093 -0.894
Industry	-0.007 (-1.464)*	-0.004 (-1.585)*	-0.006 (-2.872)***	-0.005 (-2.384)**	-0.006 (-1.588)*
Pseudo R-squared	0.133	0.136	0.123	0.088	0.103
Adjusted R-squared	0.118	0.12	0.107	0.072	0.087
Quasi-LR statistic	104.008	170.916	192.293	125.09	72.296
Prob (Quasi-LR stat)	0	0	0	0	0

Source: research findings: ( significant at 1%, 5% and 10% levels indicated by \*\*\*, \*\*, \* , respectively)

Table 7. fitness results of model2 (dependent variable: specific risk)

Quintile regression	%10	%30	%50	%70	%90
Variable	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)
C	0.103 (3.657)***	0.193 (5.071)***	0.149 (2.977)***	0.215 (4.708)***	0.361 (5.865)***
Ceop	-0.005 (-2.268)**	-0.002 (-0.684)	-0.001 (-0.216)	-1.0E-06 (-0.000)	-0.002 (-0.382)
Board size	-0.001 (-0.320)	-0.006 (-0.929)	0.003 (0.360)	0.005 (1.047)	-0.009 (-1.466)*
Indp. Directors	-0.003 (-0.232)	-0.001 (-0.047)	0.003 (0.168)	-0.010 (-0.627)	-0.033 (-1.229)
Ownership concentration	-0.017 (-1.293)	-0.024 (-2.195)**	-0.022 (-1.549)**	-0.019 (-1.060)	-0.013 (-0.528)
Management shareholding	6.2E-05 (0.607)	-2.6E-05 (-0.239)	0.0001 (0.919)	0.00010 (0.656)	-0.00020 (-0.853)
ROA	-0.001 (-1.322)	-0.001 (-3.233)***	-0.001 (-2.597)**	-0.001 (-2.854)***	-0.002 (-4.480)***
Leverage	0.040 (3.110)***	0.051 (3.154)***	0.084 (4.723)***	0.104 (4.502)***	0.086 (3.813)***
Size	-0.002 (-1.711)*	-0.005 (-3.100)***	-0.005 (-2.895)***	-0.009 (-4.095)***	-0.015 (-5.527)***
CAPEX	0.012 (0.694)	0.008 (0.389)	-0.003 (-0.094)	0.021 (0.613)	0.103 (1.792)**
Cash Flows	0.004 (0.606)	-0.002 (-0.150)	0.000 (0.038)	-0.003 (-0.450)	-0.019 (-3.499)***
Market-to-Book	0.012 (2.200)**	0.021 (8.960)***	0.025 (6.334)***	0.030 (6.175)***	0.048 (5.034)***
Age	-0.004 (-1.039)	-0.006 (-1.529)*	-0.008 (-1.805)**	-0.006 (-1.103)	0.021 (2.462)**
Ceop*Ownership	0.012 (4.748)***	0.008 (2.652)***	0.009 (1.918)**	0.010 (1.890)**	0.007 (0.570)
Ceop*Ownership*Soe	-0.001 (-0.269)	0.003 (0.687)	0.003 (0.677)	0.005 (0.948)	0.012 (1.078)
Industry	-3.2E-05 (-0.180)	3.1E-05 (0.216)	-7.0E-05 (-0.407)	-5.0E-05 (-0.177)	-0.00024 (-0.665)
Pseudo R-squared	0.079	0.091	0.110	0.132	0.173
Adjusted R-squared	0.062	0.075	0.094	0.117	0.158
Quasi-LR statistic	73.676	118.160	149.770	165.938	138.412
Prob (Quasi-LR stat)	0.000	0.000	0.000	0.000	0.000
Source: research findings: ( significant at 1%, 5% and 10% levels indicated by ***, **, * , respectively)					



Table 8. fitness results of model 3. (dependent variable: systematic risk)

Quintile regression	%10	%30	%50	%70	%90
Variable	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)	Coefficient (t-Statistic)
C	3.947 (6.962)***	3.725 (7.873)***	4.235 (10.758)***	3.765 (6.607)***	3.400 (2.607)***
Ceop	-0.087 (-1.827)**	-0.097 (-3.041)***	-0.080 (-2.934)***	-0.091 (-2.964)***	-0.171 (-3.411)***
Board size	-0.024 (-0.316)	-0.005 (-0.065)	-0.034 (-0.661)	0.018 (0.254)	-0.030 (-0.199)
Indp. Directors	0.019 (0.061)	0.081 (0.466)	0.023 (0.168)	-0.039 (-0.230)	-0.283 (-0.558)
Ownership concentration	-0.893 (-3.815)***	-0.859 (-5.168)***	-0.654 (-5.126)***	-0.462 (-2.824)***	-0.239 (-0.562)
Management shareholding	0.006 (2.591)**	0.003 (2.178)**	0.002 (1.784)**	5.4E-05 (0.036)	0.002 (0.148)
ROA	-0.012 (-2.219)**	-0.014 (-3.624)***	-0.011 (-2.433)**	-0.007 (-2.172)**	-0.013 (-1.586)*
Leverage	0.492 (1.391)*	0.434 (2.006)**	0.295 (1.577)*	0.551 (2.755)***	0.834 (2.763)***
Size	-0.040 (-1.264)	-0.043 (-1.458)*	-0.053 (-2.523)**	-0.071 (-3.605)***	-0.050 (-1.166)
CAPEX	0.898 (4.054)***	0.120 (0.589)	-0.230 (-1.177)	-0.298 (-0.943)	0.046 (0.070)
Cash Flows	-0.112 (-0.964)	-0.129 (-0.665)	-0.064 (-0.249)	0.123 (1.731)*	0.127 (0.392)
Market-to-Book	0.047 (0.505)	0.079 (2.124)**	0.087 (1.941)**	0.120 (2.318)**	0.436 (4.229)***
Age	-0.324 (-4.286)***	-0.155 (-2.593)**	-0.120 (-2.307)**	-0.032 (-0.607)	0.124 (0.763)
Ceop*Ownership	0.151 (2.658)***	0.137 (2.307)**	0.126 (3.456)***	0.111 (2.673)***	-0.023 (-0.402)
Ceop*Ownership*Soe	0.129 (1.879)**	0.068 (1.040)	0.030 (0.642)	0.018 (0.379)	0.107 (1.205)
Industry	-0.007 (-1.481)*	-0.004 (-1.560)*	-0.006 (-3.168)***	-0.005 (-2.213)**	-0.008 (-2.292)**
Pseudo R-squared	0.134	0.131	0.115	0.080	0.096
Adjusted R-squared	0.119	0.116	0.099	0.064	0.080
Quasi-LR statistic	104.399	165.065	179.100	115.099	67.699
Prob (Quasi-LR stat)	0.000	0.000	0.000	0.000	0.000

Source: research findings: ( significant at 1%, 5% and 10% levels indicated by \*\*\*, \*\*, \*, respectively)

Regarding the results of tables 6, 7 & 8, it can be stated that CEO power in different quintiles has an inverse relationship with the general and systematic risk of the firms. Therefore, by having more discretion, more powerful managers adopt less risky decisions which indicate that to prove goodwill and maintain position, CEOs prefer riskier decisions which is according to Haider and Fang (2018). Institutional investors in different quintiles have an inverse relationship with general and systematic firm risk so that this inverse effect on risk is more than CEO power. Also, the less risky the firm (general and systematic risk), the stronger this inverse relation will be. Therefore, institutional investors require CEOs to adopt decisions alongside other shareholders benefits and have a monitoring role. But, the significant point is when the relationship between institutional ownership and CEO power is examined together with individual indices of the risk, because unlike the separately available relationship between the above-mentioned variables, this relationship is positive, such that, by reducing the risk of the firms under study, the extent of this relation will be amplified. It can be said that this change of behavior can be as a result of CEO influence or monitoring power of institutional investors on manager decisions. Therefore, the role of institutional investors is more important since it affects the relationship between CEO power and firm risk, i.e. institutional investors by their resources and power require CEOs to adopt important decisions which increase firm risk which is according to the implicit notion of agency theory which indicates that large shareholders have monitoring role on CEOs discipline but in spite of their influence on the relationship between CEO power and firms risk, the main negative relationship will not be altered which is according to the studies of Jhou & Adams (2008), Haider & Fang (2016), Haider & Fang (2018), Nikbakht & Taheri (2014).

One of the most important advantages of quintile regression is that it examines the dependent variable changes to an explanatory variable during several quintiles. It is worth mentioning that blue dashes-dot in the presented figures indicate quintile coefficients and red dashes indicate confidence interval for the estimator in the considered quintile. As it can be seen, the slope coefficient of quintile regressions is different in various quintiles which indicates that the dependent variable is influenced by the independent variable. for example, in figure 1, in 10%- 30% and 70%- 90% quintiles, the general risk is more influenced comparing CEO power and the slope coefficient of the mentioned quintiles is more than quintiles under investigation. To understand this process and the above results, the coefficient change diagram is depicted in figures 1, 2, 3 for each study model.

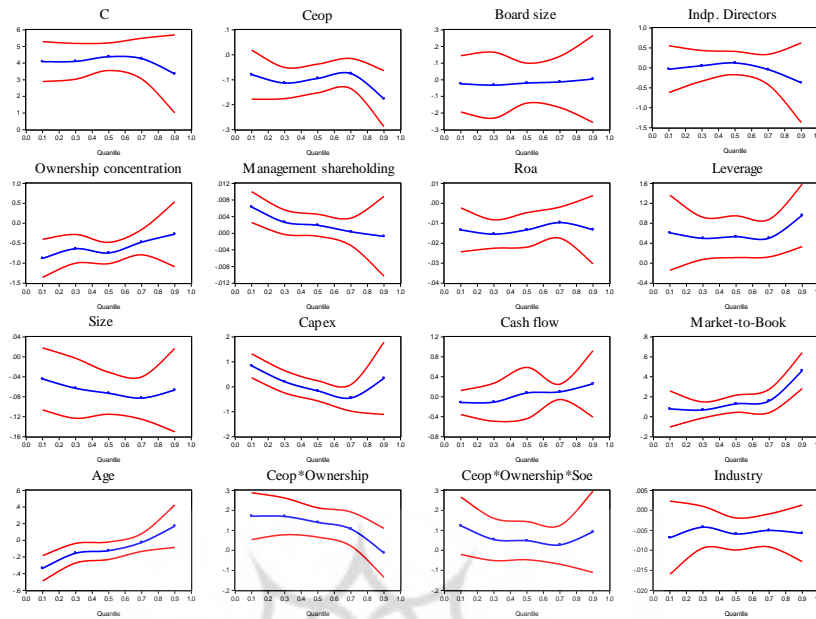


Figure 1. coefficient change of the parameters related to model1 in various quintiles.

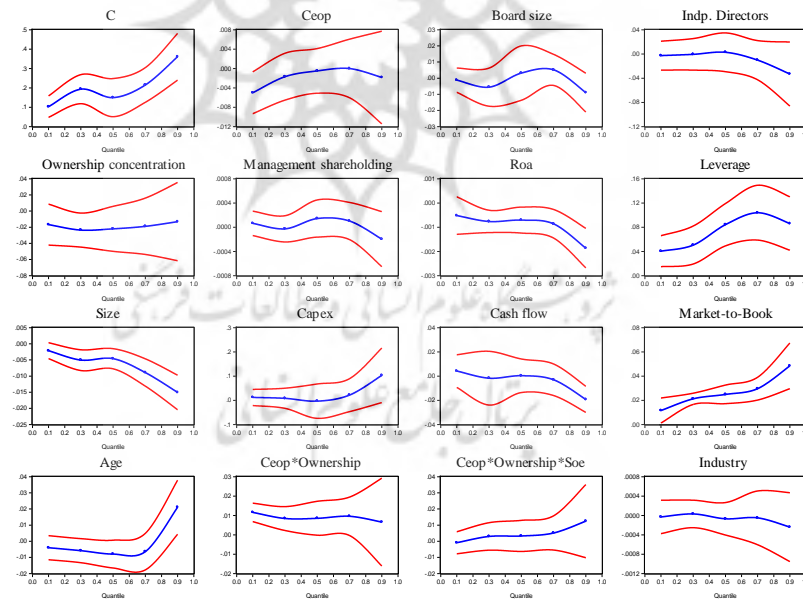


Figure 2. coefficient change of the parameters related to model 2 in various quintiles.

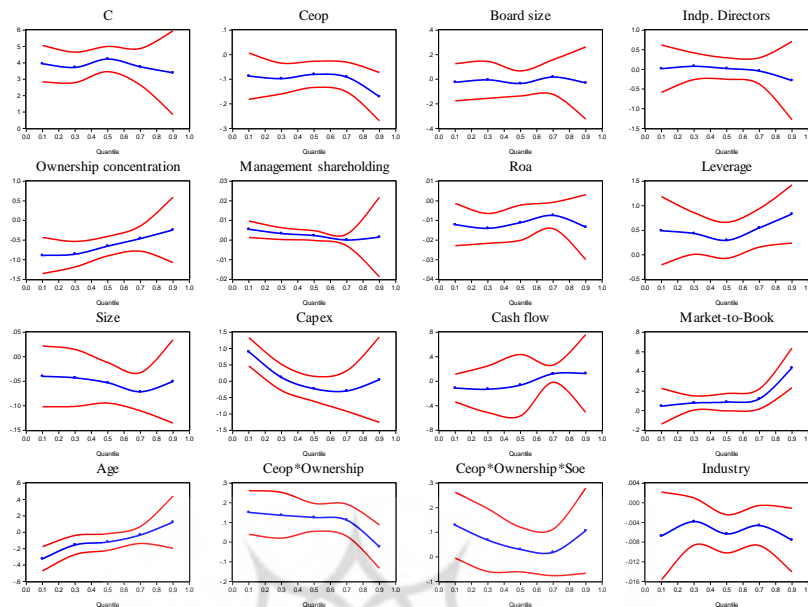


Figure 3. coefficient change of the parameters related to model 3 in various quintiles.

## Conclusion and discussion

In the present study, it is attempted to investigate the relationship between CEO power and institutional ownership with the risk-taking behavior of the member firms in the Tehran stock exchange market during 2010- 2019 by using 13 key variables and principal component analysis method for defining CEO power. To clarify this issue, general, specific and systematic risk is used as the dependent variable. The quintile method is used to fit models so that users have a more clear image of the study. following results analysis, the following findings were achieved.

Generally, the present study indicates that firm risk (general and systematic) will be lower by increasing CEO power and having more powerful CEOs. It can be mentioned that since CEO efficiency is evaluated as a result of the firms under their leadership, this will indicate the importance of failure or success of a firm for managers. So it can be formulated that eager managers who like to protect their reputation are expert decision-makers, therefore they try to reduce firm risk. also, institutional ownership among investors will reduce risk. Agency theory and the monitoring role of institutional investors can be mentioned in this regard.

While the effect of the variables is considered simultaneously, the risk will have a pronounced increase such that in the lower quintile, risk increase is more which is influenced by the two following issues:

First, Since the risk index is gained through standard deviation of the firms, It can be said that stock price is influenced by institutional owners and is more deviated. Second, managerial decisions are influenced by institutional investors which creates conflicts of interest per se, because by exerting power and influence, institutional investors affect firm strategy and the firm risk will be higher. Therefore, the above situations, both indicate institutional investors exertion of power and influence. It can be mentioned that regarding the economic and political situation of Iran, systematic risk is the most important challenge for managers and they attempt to solve this problem by adopting decisions since key variables affect general and systematic firm risk and the effect of these variables is not reliable on specific risk of the member firms of static population.

Regarding the mentioned issues, the results of this study can provide managers, investors and researchers with helpful information about the decision making process of the firms and familiarize them with the effect of these processes on firm risk. In turn, this can help managers cognitive abilities and control the effects of certain actions. Therefore, it is recommended that managers pay special attention to the results of this study. Researchers are also recommended to include more key variables in future studies and formulate CEO power accurately. By investigating the relationship between CEO power and institutional investor with the firm return, managers can also gain more accurate knowledge of the problem.

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## Appendix

## The research sample companies

no	Company Name	no	Company Name	no	Company Name
1	Abadgaran	37	Khash Cement	73	Mehrcam Pars
2	Absal	38	Khazar Cement	74	Petr. Tran
3	ama	39	Darab Cement	75	Motorsazan
4	S*Iran Transfo	40	Doroud Cement	76	Nasir Machine
5	Iran Khodro	41	Soufian Cement	77	Behran Oil
6	Iran Yasa Tire	42	Gharb Cement	78	Pars Oil
7	Irka Part	43	Siman Fars Noe	79	Aluminium R.
8	Bama	44	Shahdiran Inc	80	R. Mill Prod.
9	Gorji Biscuit	45	Ghandi Cables	81	Nirou Moharreke
10	Pars Khazar	46	Fars Chem. Ind	82	Nirou Trans
11	S*Pars Khodro	47	Kerman Tire	83	Iran Carton
12	Pars Minoo	48	Iran Refract.	84	Alvand Tile
13	Khark Petr.	49	Iran Mineral P	85	Pars Tile
14	Shazand Petr.	50	Iran Ferr	86	Saadi Tile
15	Shiraz Petr.	51	Khavar Spring	87	Sina Tile
16	Fanavaran Petr.	52	Zar Spring	88	Kaveh Paper
17	Iran Glass Wool	53	S*Mobarakeh Steel	89	Calcimine
18	I. Pegah Dairy	54	Khorasan Steel Co	90	Iran Carbon
19	Kh. Pegah Dairy	55	Iran Board	91	Chimidarou
20	Techinco	56	Isfahan Sugar	92	Alborz Darou
21	Charkheshgar	57	Ghazvin Sugar	93	Pars Darou
22	S*North Drilling	58	Bahman Group	94	Jaam Darou
23	Tuka Trans.	59	Sahand Rubber	95	Osvah Pharm.
24	Iran China Clay	60	Pars Shahab	96	Exir Pharm.
25	Inf. Services	61	Pak Dairy	97	Jaber Hayan P.
26	A. I. S. D.	62	Loabiran	98	Razak Lab.
27	DPI	63	Iran Brake L	99	Zahravi Phar.
28	Derakhshan Teh.	64	Iran M. & P. M	100	Sobhan Pharm



29	I. T. Foundry	65	Iranian Leasing	101	Farabi Pharm.
30	Mashad Wheel	66	Niromohareke M	102	Loghman Pharm.
31	Saipa Diesel	67	VAMCO	103	Daroupakhsh
32	Sepanta	68	Iran Tele. Co	104	Kowsar Pharm.
33	Sarma Afarin	69	Bahonar Copper	105	Sina Darou Lab.
34	Orumiyeh Cement	70	Iran Zinc Mines	106	Daroupakhash I.
35	Behbahan Cement	71	Iran Mn. Mines	107	Daroupakhsh P.
36	Tehran Cement	72	Iran Amlah		

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