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Evaluating the Effects of Board Size, Board Independence, CEO Non-duality, and the Existence of an Internal Audit Function on Political Connections on Stock Price Crash Risk in the Tehran Stock Exchange

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ABSTRACT

The purpose of this study was to evaluate the effects of board size, board independence, CEO non-duality, and the existence of an internal audit function (IAF) on political connections on stock price crash risk in the Tehran Stock Exchange. Therefore, institutional ownership, ownership concentration, the board size, the board independence, CEO non-duality, and the existence of an IAF were used as corporate governance mechanisms. The research hypotheses were tested using the information obtained from 84 companies listed on the Tehran Stock Exchange in 2011-2019. The results showed that board independence, CEO non-duality, and the existence of an IAF weakened the impact of political connections on stock price crash risk, while board size intensified the relationship between political connections and stock price crash risk.
Keywords: Corporate Governance Mechanisms, Political Connections, Stock Price Crash Risk

Introduction

In recent years, especially after the 2008 financial crisis, "sudden changes in stock prices" have attracted the attention of many academics and professionals. These changes occurred in the form of falling and jumping stock prices. Because investors attach great importance to their stock returns, researchers have mainly addressed the fall in stock prices leading to a sharp drop in stock returns rather than a jump in stock prices (Taghizadeh Khaneghah and Badavar Nahandi, 2017). Stock price crash risk is considered a vital element in investors' stock returns because it cannot be reduced by diversification and portfolio formation, as opposed to the risks arising from systematic fluctuations. Many researchers believe that the "bad news hoarding" theory is the underlying theory for stock price crash risk. According to this theory, managers prevent the spread of bad news to the market to protect the interests of a particular individual or group, exacerbating the probability of falling stock prices. This is due to the fact that bad news can be hoarded to a certain extent and is suddenly disclosed to the market as soon as it reaches a certain size by management, leading to a sharply reduced stock price (Bahri Sales & Ebrati, 2019).

Political connections help improve corporate performance through a variety of proxies, such as easy access to banking facilities and raw materials, simple rules and regulations, and lower taxes (Li & Wang, 2016). However, as many researchers have pointed out, political connections have a negative impact on the transparency of a company's financial reporting. According to Chaney et al. (2011), companies with political connections have a non-transparent information environment due to government support, leading to lower information quality in such companies compared to other companies. According to Houcine (2017), companies with political connections lack information asymmetry than other companies, leading to increased representation problems in such companies. He also believes that companies with political connections use a weaker disclosure mechanism and are less supportive of investor interests. A large body

of research has shown that managers try to hide bad news when investors have less information about the Company's prospects than managers (high information asymmetry). Finally, the Company's stock price drops dramatically as soon as this hoarded bad news is released (Tee, 2018).

Companies with political connections enjoy government support and, as a result, can easily hide bad news in response to market pressures. Under such circumstances, managers constantly hide their poor company performance to maximize the value of the Company. Although this secrecy can be applied to a threshold, managers are forced to disclose hidden hoarded bad news as soon as it is exceeded. The Company's stock price plummets as soon as hoarded bad news is released by management (Fang et al., 2020). For this reason, companies with stronger political connections are expected to face higher stock price crash risk.

Corporate governance mechanisms lead to the aligned interests of owners and managers, the improved future performance of the business unit, and the conditions provided for the development and expansion of the business unit. In other words, corporate governance can be used to align the interests of owners and managers. On the other hand, the scandals of recent years have led to the public perception that company managers opportunistically resort to earnings management to pursue their personal interests and ignore value creation for owners. In other words, managers resort to earnings management to mislead users of financial statements and hide bad news. Therefore, appropriate corporate governance mechanisms are expected to reduce opportunistic earnings management and bad news hoarding by management, leading to improved financial reporting quality (Kazemi et al., 2013). Therefore, strong corporate governance is expected to weaken the link between political connections and stock price crash risk. Although several studies in Iran have examined the factors affecting efficient corporate governance, so far, no research has been done on the impact of corporate governance on the relationship between political connections and stock price crash risk.

In light of the foregoing, this study seeks to answer the question, "Do corporate governance mechanisms undermine the positive impact of political connections on stock price crash risk?"

Literature Review

Mohammadi and Rezazadeh (2019) investigated the moderating role of political connections on the relationship between managerial ability and fraudulent financial reporting. The results showed that managerial ability had a negative effect on the degree of fraudulent financial reporting. They also showed that corporate political connections with the government do not undermine the effect of managerial ability in reducing fraudulent financial reporting.

In a study, Bahri Sales and Ebrati (2019) showed that political connections positively affect stock price crash risk. That is to say, managers try to pretend that the Company is in a good position by storing and preventing the spread of bad news, leading to falling stock prices in the long run. They also showed a stronger positive effect of political connections on stock price crash risk in companies with low product market competition.

Haji Alizadeh and Jafarzadeh Bishak (2020) examined the relationship between corporate innovation strategy and stock price crash risk, emphasizing managers' behavioral factors. Their statistical population consisted of all companies listed on the Tehran Stock Exchange. Using the systematic elimination sampling method, 114 companies were selected in a period of 5 years (2012-2016) as a research sample. The research hypotheses test results showed a significant inverse relationship between the Company's innovation strategy and stock price crash risk. They also showed that increased investment costs significantly affect the relationship between the Company's innovation strategy and stock price crash risk. Also, overinvestment has a significant inverse effect on the relationship between the Company's innovation strategy and stock price crash risk.

Using a large sample of Chinese companies from 2008-2013, Hu & Wang (2018) concluded that corporate political connections could reduce stock price crash risk. They noted high financial transparency in companies with political executives and a weak relationship between political connections and stock price crash risk.

Fang et al. (2020) showed that stock price crash risk is higher in companies with political connections due to high information asymmetry between managers and owners. They also concluded that financial reporting quality affects the relationship between political connections and stock price crash risk.
Panpan et al. (2020) examined the relationship between stock price crash risk and the quality of accounting information, and the impact of political connections on it in the Chinese capital market. Using data from 11076 Chinese companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange during the period 2007-2016, they achieved three important results: 1) The lower the quality of accounting information, the higher the stock price crash risk, 2) Discretionary accruals of state-owned enterprises are less likely to lead to lower stock prices than non-state-owned enterprises, and 3) Communist Party executives exacerbate the relationship between discretionary accruals and stock price crash risk. In other words, Communist Party executives increase stock price crash risk in pursuit of earnings management.

Methodology

This is a correlational study in terms of nature and content and applied in purpose, aiming to confirm or reject hypotheses inductively.
The statistical population consisted of companies listed on the Tehran Stock Exchange. Systematic removal sampling was used. Companies that managed to meet the following conditions as a sample of the study:

1. The Company must be listed on the Tehran Stock Exchange before 2011.
2. The name of the Company should not be removed from the list of companies listed on the Tehran Stock Exchange until the end of 2019.
3. It should not be part of the investment, leasing, banking, and insurance companies (due to the different nature of the operations of such companies).
4. The Company's fiscal year should end by February.
5. The Company should not have changed its fiscal year in the realm of research time.
6. The Company's shares should not have a trading halt of more than three months.
7. Book value of equity should be positive (because the negative book value of equity can distort the measurement of the growth opportunity variable. Also, companies with negative "book value of equity" are considered as companies. The financial price crash risk in such companies is much different than in other companies).
8. The data required to calculate the research variables should be available to the Company.

Following the above presumptions, 84 companies were selected from 20 industry as a research sample.

Data collection method

This study utilized specialized Persian and Latin books and articles and dissertations to study the theoretical foundations and literature review using the desk research method. The filing was also used to collect the data needed to test the research hypotheses.

Data collection tool

Information on research variables includes many of the accounting items listed in the Company's audited financial statements. Therefore, the required data were extracted from the financial statements available on the website of Islamic Research, Development and Studies Management affiliated to the Stock Exchange Organization (www.rdis.ir) and the site of comprehensive information systems of Codal publishers (www.codal.ir) and Iran Financial Information Processing Center (www.fipiran.com). They seem to have higher reliability than other available sources. Other required company information was also collected from Rahavard Novin software if required.

Research Hypothesis

Depending on the problem, objectives, and research questions, hypotheses can be formulated as follows:
H1: board size undermines the positive impact of political connections on stock price crash risk.

H2: board independence undermines the positive impact of political connections on stock price crash risk.
H3: CEO non-duality undermines the positive impact of political connections on stock price crash risk.
H4: The existence of an IAF undermines the positive impact of political connections on stock price crash risk.

Hypothesis testing models

Hypotheses are tested using Equation (1). After equation (1) is satisfied, if β3<β1 with a significant difference between them, the hypothesis under test is confirmed.

$$Crash_{i,t+1} = \beta_0 + \beta_1 CG_{i,t} + \beta_2 Political_{i,t} + \beta_3 (CG_{i.t} * Political_{i,t}) + \beta_4 Crash_{i,t} + \beta_5 Ret_{i,t} + \beta_6 Volume_{i,t} + \beta_7 Sigmar_{i,t} + \beta_8 MTB_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Lev_{i,t} + \beta_{11} ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:

Crash: stock price crash risk, CG: corporate governance mechanisms, Political: political connections, CG * Political: effect of interactive corporate governance mechanisms and political connections, Ret: annual returns on stocks, Volume: turnover, Sigmar: standard deviation of monthly returns on stocks, MTB: growth opportunity, Size: firm size, Lev: financial leverage, ROA: return on assets, i: corporate component, t: time component, Ɛ: disturbance terms.

Data analysis method

Data were analyzed using descriptive statistics, including indices of dispersion, and inferential statistics, including regression model.

Results

Descriptive statistics of research variables: Table 1 provides a summary of the descriptive statistics of the research variables.

Table 1: Descriptive statistics of research variables

Symbol	Mean	Median	Min	Max	SD	coefficient of skewness
Crash	-0.285	-0.262	-2.629	2.257	0.755	-0.105
Political	0.019	0.006	0.0002	0.583	0.053	5.925
CG	0.763	0.756	0.414	1.049	0.129	-0.025
Conc	0.699	0.766	0.000	0.970	0.214	-1.449
Inst	0.452	0.430	0.000	0.997	0.324	0.079
BSize	1.611	1.609	1.609	1.945	0.028	11.46
Indep	0.278	0.000	0.000	1.000	0.347	0.589
UnDual	0.754	1.000	0.000	1.000	0.430	-1.182
IntAud	0.784	1.000	0.000	1.000	0.411	-1.381
Ret	0.575	0.218	-0.658	5.743	1.057	1.789
Volume	30.95	31.23	23.61	35.91	2.347	-1.020
Sigmar	0.129	0.115	0.004	0.663	0.078	1.315
MTB	2.498	2.089	0.276	15.85	1.803	2.643
Size	27.94	27.92	23.98	33.05	1.320	0.451
Lev	0.072	0.038	0.000	0.406	0.086	1.955
ROA	0.275	0.209	-0.153	1.527	0.245	1.509

Crash :stock price crash risk, Political :political connections, CG :corporate governance mechanisms, Conc :Ownership concentration, Inst :Institutional ownership, BSize :board size, Indep :board independence, UnDual :CEO non-duality, IntAud : the existence of an IAF, Ret :annual returns on stocks, Volume :turnover, Sigmar :standard deviation of monthly returns on stocks, MTB :growth opportunity, Size :firm size, Lev :financial leverage, ROA :return on assets.

Coefficient of correlation between research variables

Table 2 shows the matrix of correlation coefficients between the research variables. As seen, there is a reasonable correlation between research variables and models with low probability collinearity.

Table 2: Correlation coefficient between research variables

Symbol	Crash	Political	CG	Conc	Inst	BSize	Indep	UnDual	IntAud
Crash	1								
Political	-0.034	1							
CG	-0.027	۰/۲۸۳***	1						
Conc	0.003	0.158***	0.456***	1					
Inst	0.006	0.067*	0.478***	0.279***	1				
BSize	-0.014	-0.007	0.001	-0.083**	-0.025	1			
Indep	-0.030	0.262***	0.518***	0.168***	0.008	-0.069*	1		
UnDual	0.002	0.120***	0.379***	-0.051	-0.040	0.049	-0.029	1	
IntAud	-0.033	0.050	0.438***	0.036	0.007	0.003	0.075*	-0.248***	1
Ret	-0.191***	0.486***	0.202***	0.136***	0.052	-0.019	0.150***	0.074*	0.066*
Volume	-0.059	-0.034	0.017	-0.137***	-0.083**	0.039	-0.179***	0.194***	0.116***
Sigmar	-0.386***	0.047	0.051	-0.008	-0.021	-0.009	-0.028	0.018	0.123***
MTB	-0.042	0.158***	0.159***	0.090**	0.009	-0.013	-0.049	0.059	0.144***
Size	0.059	0.045	0.096**	-0.011	0.051	0.016	-0.066*	0.090**	0.108***
Lev	0.007	-0.021	-0.054	-0.075*	0.035	-0.072*	0.086**	-0.197***	0.046
ROA	-0.041	-0.014	0.030	0.106***	0.085**	-0.022	0.230***	-0.303***	0.057

Crash: stock price crash risk, Political: political connections, CG: corporate governance mechanisms, Conc: Ownership concentration, Inst: Institutional ownership, BSize: board size, Indep: board independence, UnDual: CEO non-duality, IntAud: the existence of an IAF, Ret: annual returns on stocks, Volume: turnover, Sigmar: standard deviation of monthly returns on stocks, MTB: growth opportunity, Size: firm size, Lev: financial leverage, ROA: return on assets, ***: significant at a confidence level of 99%, **: significant at a confidence level of 95%, *: significant at a confidence level of 90%

Table 2: Correlation coefficient between research variables (continued)

Symbol	Ret	Volume	Sigmar	MTB	Size	Lev	ROA
Ret	1						
Volume	0.152***	1					
Sigmar	0.520***	0.340***	1				
MTB	0.354***	-0.007	0.131***	1			
Size	0.051	0.561***	-0.034	-0.030	1		
Lev	-0.119***	-0.366***	-0.023	-0.162***	-0.298***	1	
ROA	0.094**	-0.441***	-0.013	0.022	-0.151***	0.244***	1

Ret: annual returns on stocks, Volume: turnover, Sigmar: standard deviation of monthly returns on stocks, MTB: growth opportunity, Size: firm size, Lev: financial leverage, ROA: return on assets, ***: significant at a confidence level of 99%, **: significant at a confidence level of 95%, *: significant at a confidence level of 90%.

Stationary of research variables: The results of the Levin–Lin–Chu test are presented in Table 3.

Table 3: Levin–Lin–Chu test results for research variables

Title	Symbol	t-statistic	Probability	Result
Stock price crash risk	*Crash*	-19.55	0.000	Stationary
Political connections	*Political*	-12.49	0.000	Stationary
Corporate governance mechanisms	*CG*	-357.4	0.000	Stationary
Ownership concentration	*Conc*	-240.3	0.000	Stationary
Institutional ownership	*Inst*	-135.2	0.000	Stationary
Board size	*BSize*	-1.500	0.066	Non-stationary
Board independence	*Indep*	-5.405	0.000	Stationary
CEO non-duality	*UnDual*	-3.134	0.000	Stationary
Existence of an IAF	*IntAud*	-5.974	0.000	Stationary
Annual returns on stocks	*Ret*	-11.39	0.000	Stationary
Turnover	*Volume*	-31.36	0.000	Stationary
Standard deviation of monthly returns on stocks	*Sigmar*	-24.33	0.000	Stationary
Growth opportunity	*MTB*	-45.92	0.000	Stationary
Firm size	*Size*	-48.41	0.000	Stationary
Financial leverage	*Lev*	-36.65	0.000	Stationary
Return on assets	*ROA*	-33.23	0.000	Stationary

As shown in Table 3, all research variables are stationary except "board size." If some variables of the model are stationary, and others are non-stationary, the estimation of the model may lead to a spurious regression. In this case, spurious regression is prevented before estimating the model by performing residual-based tests for cointegration. After ensuring a long-term relationship between the dependent variable and the independent variables, the desired pattern can be estimated. For this purpose, this study uses residual-based tests for cointegration. The results indicated a long-term relationship between the dependent variable and the independent variables. To do this, the Generalized Least Squares (OLS) regression method can be used (statistical value: -9.338).

Choosing the appropriate pattern

F-Limer test and Hausman test were used to select between pooled data and panel data methods and from fixed effects and random effects in panel data, respectively. Table 4 presents the results of the F-LIMER and Hausman tests for the research models.

Table 4: Results of F-Limer test and Hausman test for research models

Model	Test	Statistic	probability	Result
H1 testing model	F-Limer	1.217	0.104	Pooled data used
	Hausman	-	-	-
H2 testing model	F-Limer	1.653	0.000	Panel data used
	Hausman	103.3	0.000	Fixed effects used
H3 testing model	F-Limer	1.187	0.136	Pooled data used
	Hausman	-	-	-
H4 testing model	F-Limer	1.321	0.037	Panel data used
	Hausman	83.59	0.000	Fixed effects used

Classical regression assumptions:

Table 5: Results of classical regression hypotheses (normal distribution and homoscedasticity)

Jarque–Bera test	Symbol	Statistic	Probability	Result
Stock price crash risk	*Crash*	4.769	0.092	Normally distributed
White test	**F-statistic**	**Probability**	**Result**	
H1 testing model	2.615	0.000	Heteroscedasticity	
H2 testing model	4.163	0.000	Heteroscedasticity	
H3 testing model	3.132	0.000	Heteroscedasticity	
H4 testing model	2.405	0.000	Heteroscedasticity	

According to Table 5, we can say:

The probability of the Jarque–Bera test statistic is greater than 0.05 for the dependent variable (stock price crash risk). Therefore, it can be concluded that this variable is normally distributed.

This study used the White test to test homoscedasticity. The estimated generalized least squares (EGLS) regression method was used to fit the models because all research models have variance heterogeneity.

Durbin-Watson statistic was used to test for the presence or absence of autocorrelation. Variance inflation factor (VIF) was also used to assess the presence or absence of multicollinearity. The results of Durbin-Watson and VIF statistics are presented in Tables 6-9.

Hypothesis testing

- **H1 testing:** Table 6 shows the effect of board size on the relationship between political connections and stock price crash risk. If β3<β1 with a significant difference between them, the sub-hypothesis under test is confirmed.

Table 6: The effect of board size on the relationship between political connections and stock price crash risk

$$Crash_{i,t+1} = \beta_0 + \beta_1 BSize_{i,t} + \beta_2 Political_{i,t} + \beta_3 (BSize_{i,t} * Political_{i,t}) + \beta_4 Crash_{i,t} + \beta_5 Ret_{i,t} + \beta_6 Volume_{i,t} + \beta_7 Sigmar_{i,t} + \beta_8 MTB_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Lev_{i,t} + \beta_{11} ROA_{i,t} + \varepsilon_{i,t}$$

Symbol	Coefficient	SD	t-statistic	Probability	VIF
Intercept	3.058	1.484	2.060	0.039	-
BSize	-3.344	0.877	-3.808	0.000	1.369
Political	-128.8	48.57	-2.653	0.008	1.450
BSize*Political	84.58	30.16	2.804	0.005	1.449
Crash	0.002	0.028	0.080	0.935	1.191
Ret	0.068	0.027	2.457	0.014	2.404
Volume	0.028	0.012	2.265	0.023	2.429
Sigmar	-0.315	0.349	-0.903	0.366	2.148
MTB	0.032	0.012	2.544	0.011	1.248
Size	0.045	0.017	2.537	0.011	1.620
Lev	-1.989	0.241	-8.219	0.000	1.304
ROA	-0.489	0.088	-5.508	0.000	1.441
Coefficient of determination		0.535	The adjusted coefficient of determination		0.527
F-statistic) probability(		)0.000 (69.05	Durbin-Watson		2.030
Wald test) H_0: $\beta_0=\beta_1$(			)0.004 (-2.871		

Crash .stock price crash risk, BSize .board size, Political .political connections, BSize*Political .interaction effect of board size و political connections, Ret .annual returns on stocks, Volume .turnover, Sigmar .standard deviation of monthly returns on stocks, MTB .growth opportunity, Size .firm size, Lev .financial leverage, ROA .return on assets, i .corporate component, t .time component, Ɛ .disturbance terms.

F-test: In a multivariate regression equation, all coefficients of the independent variables in the equation must be equal to 0 in the absence of a relationship between the dependent variable and the independent variables. Therefore, the regression equation should be tested for significance, using F-statistic. As can be seen, the F-statistic values and probabilities are 69.05 and 0.000, respectively. This indicates that H0 is rejected, meaning that the whole model is insignificant (all coefficients are 0), and the estimated regression model is significant overall.

Variance inflation factor (VIF): Since VIF is not significantly different from unity for the explanatory variables of the model, it can be concluded that the model lacks multicollinearity.

Determinant: Determinant is a measure that describes the strength of the relationship between a dependent variable and independent variables. The value of this coefficient determines what percentage of the dependent variable changes are explained by the independent variables. The coefficient of determination of this model is 0.535, which means that independent variables can explain 53.5% of the dependent variable changes.

Durbin-Watson: The Durbin-Watson value of this model is 2.030. Since this statistic is in the range of 1.5-2.5, there is no autocorrelation between residuals.

T-test: As can be seen, the coefficient of the variable "interaction effect of board size and political connections" is smaller than the coefficient of the variable "political connections" (β3>β1). Since the coefficient of variable "interactive effect of board size and political connections" is significant and the value of Wald test statistics indicates a significant difference between the mentioned coefficients, it can be acknowledged that board size significantly increases the effect of political connections on stock price crash risk. This result is in line with the researcher's expectations. Therefore, H1 is rejected.

- **H2 testing:** Table 7 shows the effect of board independence on the relationship between political connections and stock price crash risk. If β3<β1 with a significant difference between them, the sub-hypothesis under test is confirmed.

Table 7: The effect of board independence on the relationship between political connections and stock price crash risk

$$Crash_{i,t+1} = \beta_0 + \beta_1 Indep_{i,t} + \beta_2 Political_{i,t} + \beta_3 (Indep_{i,t} * Political_{i,t}) + \beta_4 Crash_{i,t} + \beta_5 Ret_{i,t} + \beta_6 Volume_{i,t} + \beta_7 Sigmar_{i,t} + \beta_8 MTB_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Lev_{i,t} + \beta_{11} ROA_{i,t} + \varepsilon_{i,t}$$

Symbol	Coefficient	SD	t-statistic	Probability	VIF
Intercept	-2.219	0.931	-2.382	0.017	-
Indep	0.165	0.083	1.975	0.048	1.662
Political	34.96	1.787	19.55	0.000	2.882
Indep*Political	-36.39	2.308	-15.76	0.000	3.142
Crash	-0.044	0.025	-1.723	0.085	1.222
Ret	0.110	0.024	4.539	0.000	2.700
Volume	0.041	0.015	2.584	0.010	2.997
Sigmar	-0.398	0.319	-1.247	0.212	2.084
MTB	0.026	0.014	1.848	0.065	1.395
Size	0.018	0.040	0.468	0.639	2.779
Lev	-1.385	0.282	-4.906	0.000	1.777
ROA	-0.685	0.111	-6.138	0.000	1.965
Coefficient of determination		0.740	The adjusted coefficient of determination		0.697
F-statistic) Probability(		)0.000 (17.48	Durbin-Watson		2.206
Wald test) H_0: $\beta_0=\beta_1$(			)0.000 (15.62		

Crash .stock price crash risk, Indep .board independence, Political .political connections, Indep*Political / .Interaction effect of board independence و political connections, Ret .annual returns on stocks, Volume .turnover, Sigmar .standard deviation of monthly returns on stocks, MTB .growth opportunity, Size .firm size, Lev .financial leverage, ROA .return on assets, i .corporate component, t .time component, Ɛ .disturbance terms.

F-test: In a multivariate regression equation, all coefficients of the independent variables in the equation must be equal to 0 in the absence of a relationship between the dependent variable and the independent variables. Therefore, the regression equation should be tested for significance, using F-statistic. As can be seen, the F-statistic values and probabilities are 17.48 and 0.000, respectively. This indicates that H0 is rejected, meaning that the whole model is insignificant (all coefficients are 0), and the estimated regression model is significant overall.

Variance inflation factor (VIF): Since VIF for the explanatory variables of the model is not significantly different from unity, it can be concluded that the model lacks multicollinearity.

Determinant: Determinant is a measure that describes the strength of the relationship between a dependent variable and independent variables. The value of this coefficient determines what percentage of the dependent variable changes are explained by the independent variables. The coefficient of determination of this model is 0.740, which means that independent variables can explain 74% of the dependent variable changes.

Durbin-Watson: The Durbin-Watson value of this model is equal to 2.206. Since this statistic is in the range of 1.5-2.5, there is no autocorrelation between residuals.

T-test: As can be seen, the coefficient of the variable "interaction effect of board independence and political connections" is smaller than the coefficient of the variable "political connections" ($\beta3<\beta1$). Since the coefficient of variable "interaction effect of board independence and political connections" is significant and the value of Wald test statistics indicates a significant difference between the mentioned coefficients, it can be acknowledged that board size significantly increases the effect of political connections on stock price crash risk. Therefore, H2 is confirmed.

- **H3 testing**

Table 8 shows the effect of CEO non-duality on the relationship between political connections and stock price crash risk. If $\beta3<\beta1$ with a significant difference between them, the sub-hypothesis under test is confirmed.

Table 8: The effect of CEO non-duality on the relationship between political connections and stock price crash risk

$$Crash_{i,t+1} = \beta_0 + \beta_1 UnDual_{i,t} + \beta_2 Political_{i,t} + \beta_3 (UnDual_{i.t} * Political_{i,t}) + \beta_4 Crash_{i,t} + \beta_5 Ret_{i,t} + \beta_6 Volume_{i,t} + \beta_7 Sigmar_{i,t} + \beta_8 MTB_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Lev_{i,t} + \beta_{11} ROA_{i,t} + \varepsilon_{i,t}$$

Symbol	Coefficient	SD	t-statistic	Probability	VIF
Intercept	-2.130	0.435	-4.887	0.000	-
UnDual	0.520	0.055	9.297	0.000	2.142
Political	56.33	4.128	13.64	0.000	1.228
*UnDual*Political*	-49.54	4.142	-11.96	0.000	1.255
Crash	0.015	0.026	0.570	0.568	1.185
Ret	0.067	0.025	2.622	0.008	2.383
Volume	0.026	0.011	2.296	0.022	2.471
Sigmar	-0.383	0.323	-1.185	0.236	2.119
MTB	0.016	0.011	1.434	0.151	1.268
Size	0.021	0.017	1.253	0.210	1.660
Lev	-1.465	0.229	-6.377	0.000	1.384
ROA	-0.289	0.083	-3.447	0.000	1.573
Coefficient of determination		0.603	The adjusted coefficient of determination		0.596
F-statistic) probability(		)0.000 (91.19	Durbin-Watson		2.011
Wald test) H_0: $\beta_0=\beta_1$(			)0.000 (11.97		

Crash :stock price crash risk, UnDual :CEO non-duality, Political :political connections, UnDual*Political :Effect of CEO non-duality and political connections, Ret :annual returns on stocks, Volume :turnover, Sigmar :standard deviation of monthly returns on stocks, MTB :growth opportunity, Size :firm size, Lev :financial leverage, ROA :return on assets, i :corporate component, t :time component, Ɛ :disturbance terms.

F-test: In a multivariate regression equation, all coefficients of the independent variables in the equation must be equal to 0 in the absence of a relationship between the dependent variable and the independent variables. Therefore, the regression equation should be tested for significance, using F-statistic. As can be seen, the F-statistic values and probabilities are 91.19 and 0.000, respectively. This indicates that H0 is rejected, meaning that the whole model is insignificant (all coefficients are 0), and the estimated regression model is significant overall.

Variance inflation factor (VIF): Since VIF for the explanatory variables of the model is not significantly different from unity, it can be concluded that the model lacks multicollinearity.

Determinant: Determinant is a measure that describes the strength of the relationship between a dependent variable and independent variables. The value of this coefficient determines what percentage of the dependent variable changes are explained by the independent variables. The coefficient of determination of this model is equal to 0.603, which means that independent variables can explain 60.3% of the dependent variable changes.

Durbin-Watson: The Durbin-Watson value of this model is 2.011. Since this statistic is in the range of 1.5-2.5, there is no autocorrelation between residuals.

T-test: As can be seen, the coefficient of variable "interaction effect of CEO non-duality and political connections" is smaller than the coefficient of variable "political connections" ($\beta 3<\beta 1$). Since the coefficient of variable "interaction effect of CEO non-duality and political connections" is significant and the value of Wald test statistics indicates a significant difference between the mentioned coefficients, it can be acknowledged that CEO non-duality significantly reduces the effect of political connections on stock price crash risk. Therefore, H3 is approved.

- **H4 testing**

Table 9 shows the effect of the existence of an IAF on the relationship between political connections and stock price crash risk. If $\beta 3<\beta 1$ with a significant difference between them, the sub-hypothesis under test is confirmed.

Table 9: The effect of the existence of an IAF on the relationship between political connections and stock price crash risk

$$Crash_{i,t+1} = \beta_0 + \beta_1 IntAud_{i,t} + \beta_2 Political_{i,t} + \beta_3 (IntAud_{i,t} * Political_{i,t}) + \beta_4 Crash_{i,t} + \beta_5 Ret_{i,t} + \beta_6 Volume_{i,t} + \beta_7 Sigmar_{i,t} + \beta_8 MTB_{i,t} + \beta_9 Size_{i,t} + \beta_{10} Lev_{i,t} + \beta_{11} ROA_{i,t} + \varepsilon_{i,t}$$

Symbol	Coefficient	SD	t-statistic	Probability	VIF
Intercept	-3.589	1.124	-3.193	0.001	-
IntAud	-0.010	0.053	-0.199	0.842	1.444
Political	13.43	1.498	8.962	0.000	1.320
*IntAud*Political*	-6.265	1.490	-4.202	0.000	1.242
Crash	-0.039	0.030	-4.304	0.192	1.220
Ret	0.006	0.029	0.224	0.822	2.750
Volume	0.051	0.018	2.812	0.005	3.021
Sigmar	0.287	0.374	0.767	0.443	2.152
MTB	0.046	0.016	2.791	0.005	1.427
Size	0.059	0.047	1.252	0.210	2.931
Lev	-1.965	0.350	-5.602	0.000	1.904
ROA	-0.429	0.128	-3.333	0.000	1.902
Coefficient of determination		0.631	The adjusted coefficient of determination		0.571
F-statistic) probability(		)0.000 (10.52	Durbin-Watson		2.224
Wald test) H_0: $\beta_0=\beta_1$(			)0.000 (4.138		

Crash: stock price crash risk, IntAud: the existence of an IAF, Political :political connections, IntAud*Political: Interaction effect of the existence of an IAF and political connections, Ret: annual returns on stocks, Volume :turnover, Sigmar: standard deviation of monthly returns on stocks, MTB: growth opportunity, Size: firm size, Lev: financial leverage, ROA: return on assets, i: corporate component, t: time component, Ɛ: disturbance terms.

F-test: In a multivariate regression equation, all coefficients of the independent variables in the equation must be equal to 0 in the absence of a relationship between the dependent variable and the independent variables. Therefore, the regression equation should be tested for significance, using F-statistic. As can be seen, the F-statistic values and probabilities are 10.52 and 0.000, respectively. This indicates that H0 is rejected, meaning that the whole model is insignificant (all coefficients are 0), and the estimated regression model is significant overall.

Variance inflation factor (VIF): Since VIF for the explanatory variables of the model is not significantly different from unity, it can be concluded that the model lacks multicollinearity.

Determinant: Determinant is a measure that describes the strength of the relationship between a dependent variable and independent variables. The value of this coefficient determines what percentage of the dependent variable changes are explained by the independent variables. The coefficient of determination of this model is equal to 0.631, which means that independent variables can explain 63.1% of the dependent variable changes.

Durbin-Watson: The Durbin-Watson value of this model is equal to 2.224. Since this statistic is in the range of 1.5-2.5, there is no autocorrelation between residuals.

T-test: As can be seen, the coefficient of the variable "interaction effect of the existence of an IAF and political connections" is smaller than the coefficient of the variable "political connections" ($\beta 3 < \beta 1$). Since the coefficient of variable "interaction effect of the existence of an IAF and political connections" is significant and the value of Wald test statistics indicates a significant difference between the coefficients, it can be acknowledged that the existence of an IAF significantly reduces the effect of political connections on stock price crash risk. Therefore, H4 is approved.

Conclusion

The purpose of this study was to evaluate the effect of board size, board independence, CEO non-duality, and the existence of an IAF on political connections on stock price crash risk in the Tehran Stock Exchange. To answer the research questions and test the research hypotheses, the relationships between the variables were examined using information obtained from 84 companies listed on the Tehran Stock Exchange in 2011-2019.

The results are as follows:

- The effect of board size on the relationship between political connections and stock price crash risk was investigated. The results showed that the larger the board size, the greater the impact of

political connections on stock price crash risk. This result contradicted the researcher's expectations and led to the rejection of the relevant sub-hypothesis. However, this conclusion can be explained by the fact that the efficiency of the members' supervisory role decreases due to the lack of consensus among the members of the large boards and the operational and supervisory inconsistencies between them. Also, large boards are more likely to dismiss and install members for non-operational reasons. This leads board members to overlook many shortcomings or biases by management in specific cases. These probabilities occur in the Iranian financial market, enhancing the impact of political connections on stock price crash risk in companies with large boards of directors compared to other companies.

- According to H2 findings, it can be concluded that board independence weakens the relationship between political connections and stock price crash risk. Because executive directors' responsibilities are closely related to CEO responsibilities, non-executive directors are expected to play a management oversight role. The interests of executives mainly depend on the desirability of the Company's financial situation and performance; Hence, these managers seized every opportunity to hide bad news. Nevertheless, non-executive board members are mostly looking to gain a better reputation and future careers through more effective oversight of executives. This conflict leads to improved "management oversight" and limits managers to bad news hoarding. This limitation leads to a significant reduction in the impact of political connections on stock price crash risk.
- The results of the H3 test show that CEO non-duality undermines the positive effect of political connections on stock price crash risk. The duality of the CEO's duties refers to the situation in which the CEO is also the chairman of the board while increasing the scope of the CEO's authority. As a result, other board members may be prevented from overseeing the CEO. Under such circumstances, decision-making power is centralized, and the possibility of voluntary disclosure of the information is reduced. The duality of CEO duties also reduces the threat of job loss. It also reduces the CEO's motivation to improve performance and encourages him to show more opportunistic behavior. Therefore, CEO non-duality increases the effectiveness of the supervisory role of board members and voluntary disclosures of information and reduces the probability of the occurrence of opportunistic behaviors of managers. This leads to a reduction in the positive impact of political connections on stock price crash risk.
- According to H4 findings, the existence of an IAF has a diminishing effect on the relationship between political connections and stock price crash risk. Based on the existing theoretical literature, in companies with effective internal auditors and internal controls, managers' ability to conceal bad company news is limited due to effective monitoring of their behavior, which in turn reduces the probability of one-time communication. Bring bad news to the market. This leads to a weakened effect of political connections on stock price crash risk. According to the research findings, shareholders are suggested to consider the extent of the company's political connections when deciding whether to buy, hold, or sell shares. Also, since corporate governance mechanisms affect the relationship between political connections and the company's stock price crash risk, the competent authorities are recommended to improve the laws and regulations related to corporate governance mechanisms and enforce these laws more seriously. Finally, to conduct further studies, future researchers are reminded that many industries active in the Tehran Stock Exchange, such as the refining and chemical industries, are strongly influenced by political factors. Therefore, researchers are suggested to study the effect of corporate political connections on stock price crash risk at the industry level and compare the results. Thus, the degree to which political connections affect stock price crash risk in different industries can be determined. Since the capital market has received more attention in the last two years and companies have become more and more under the microscope, researchers have suggested examining the effect of media coverage on the relationship between political connections and stock price crash risk.

References

[1] Taghizadeh Khaneghah, Vahid; Badavar Nahandi, Younes. (2017). "Effects of Dividend Payment and Non-Publication of Bad News on Stock Price Crash Risk with Emphasis on Information Asymmetry." Accounting and Auditing Review, Vol. 24, No. 1, pp. 19-40.

[2] Bahri Sales, Jamal; Ebrati, Mohammad Reza (2019). "Effects of Political Connections on Stock Price Crash Risk with Emphasis on Product Market Competition in Companies Listed on the Tehran Stock Exchange." Investment Knowledge, Vol. 8, No. 29, pp. 275-296.

[3] Lee, W., Wang, L. (2016). Do Political Connections Affect Stock Price Crash Risk? Firm-Level Evidence from China. Review of Quantitative Finance and Accounting, Vol. 48, No. 3, pp. 643-676.

[4] Houcine, A. (2017). The Effect of Financial Reporting Quality on Corporate Investment Efficiency: Evidence from the Tunisian Stock Market. Research in International Business and Finance, Vol. 42, pp. 321-337.

[5] Tee. C.M. (2018). Political Connections and Stock Price Crash Risk: Evidence of Institutional Investors' Heterogeneous Monitoring. Spanish Journal of Finance and Accounting, Vol. 48, No. 1, pp. 50-67.

[6] Fang, T.Y., Lin, F., Lin, S.W., Huang, Y.H., (2020a). The Association between Political Connection and Stock Price Crash Risk: Using Financial Reporting Quality as a Moderator. Finance Research Letters, In Press, Corrected Proof, Available At: https://Www.Sciencedirect.Com/Science/Article/Abs/Pii/S1544612319302715

[7] Kazemi, Hussein; Hemmati, Hassan; Rostami, Zeinab (2013). "Effects of Corporate Governance Mechanisms on Financial Performance and Information Transparency." Applied Research in Financial Reporting, Vol. 2, No. 3, pp. 123-148.

[8] Mohammadi, Abdullah; Rezazadeh, Javad (2019). "Managerial Ability, Political Connections, and Fraudulent Financial Reporting." Accounting and Auditing Review, Vol. 26, No. 2, pp. 217-238.

[9] Haji Alizadeh, Masoumeh; Jafarzadeh Bishak, Mohammad Sadegh. (2020). "Relationship Between Corporate Innovation Strategy and Stock Price Crash Risk with Emphasis on the Behavioral Factor of Managers." Accounting and Management Perspectives, Vol. 3, No. 21, pp. 80-96.

[10] Hu, G., Wang, Y. (2018). Political Connections and Stock Price Crash Risk: The Role of Intermediary Information Disclosure. China Finance Review International, Vol. 8, No. 2, pp. 140-157.

[11] Panpan, F., Jeon, S., Park, M. (2020). The Effect of Political Connections on the Relationship between Stock Price Crash Risk and the Quality of Accounting Earnings: Evidence from China. Korean Management Review, Vol. 49, No. 1, pp. 1-29.