The Influence of Independent Director Characteristics on Financial Fraud Based on A-share Listed Companies

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Abstract. Recently, independent directors have attracted the attention of scholars, and the possible impact of their different characteristics has become a hot research topic. The frequent occurrence of financial fraud incidents has stimulated academic circles to think about the corporate fraud. In this context, this article's sample is the A-shared public company in China for 10 years. By accessing to consult relevant literature, hypotheses are proposed and logistic regression models are established. For a more comprehensive consideration, the study not only considers the effects of the individual characteristic but also builds a comprehensive indicator. It can be seen from the outcomes that independent directors' comprehensive characteristics and financial fraud are significantly negatively correlated. Female and highly educated independent directors, and those with academic, financial and accounting background play an important role in reducing the company's financial fraud. Based on this, diversification and overall consideration of independent directors cannot be ignored. This is helpful for strengthening corporate governance and reducing financial fraud.

Keywords: Characteristics of independent directors, financial fraud, corporate governance.

1. Introduction

Financial fraud is not unusual in the capital market. It has been the topic of market and academic discussion ever since Enron's financial deception in 2001. In the next ten years, financial fraud of listed companies occurred frequently, from the financial fraud of WorldCom and Xerox in the United States to the domestic financial fraud of LANTIAN, KDX and KANGMEI. Despite numerous attempts to outlaw and penalize financial fraud, it seems to be spreading, which is causing investors' confidence in the financial statements to erode. Under the information asymmetry phenomena and Principal-Agent problem, financial statements become a crucial way for shareholders to understand the company's operating conditions. Thus, eradicating financial fraud committed by listed firms is vital to preserving the capital market's healthy growth.

Internal governance failure and management dereliction are primary grounds for financial fraud. In the context of the Principle-Agent problem, the establishment of independent directors introduces a third-party mechanism, which aims to improve the corporate governance structure, prevent internal control and the erosion of minority shareholders' interests by major shareholders, and provide protection for the overall interests of the company. However, the frequent occurrence of financial fraud has made independent directors increasingly questioned by the market. What kind of directors are the most diligent and dutiful to play a good supervisory role? Many studies have shown that the educational background, professional ability and social relations directly affect their performance. Nevertheless, existing studies mainly focus on the single characteristic, and rarely comprehensively examine the impact of different characteristics on financial fraud. Yet independent directors account for more than 1/3 of the seats on the board of directors. Their involvement in governance is significantly impacted by their comprehensive traits.

The author puts forth this idea against this backdrop. The paper selects five independent director characteristics, studies how these characteristics affect corporate financial fraud, and builds a comprehensive indicator to fully assess their effects. It broadens the scope of research on the independent director governance and explores the effect of their roles in decreasing financial fraud, which is crucial for improving investors' confidence in the reliability of the company's financial statements, safeguarding the interests of creditors and shareholders, and preserving the steady and

healthy growth of the capital market. The shareholders of the company can also pay attention to the personal characteristics of independent directors and find early warning of the potential financial fraud to avoid the harm of it.

2. Model Setting and Research Assumptions

2.1. Sample Determination and Data Processing

In order to make the conclusion more realistically, the 2011-2020 data of Shanghai and Shenzhen A-share public companies become the target of this paper's sample selection. There are two reasons to choose them. For one thing, these data are more accurate and transparent. For another, these firms are the most representative whose ownership and control are completely separated and governance structures are more legalized.

Furthermore, this article advances the measurement of financial fraud. Previously, audit opinions and financial restatements were used to measure fraud. They are widely available, but only cover partially. To collect more data, the author refers to Wang's research on the types of illegal fraud and screens out financial fraud in the violation records [1]. The data is processed as follows.

Eliminate ST, PT and financial insurance firms. Remove duplicate samples. The author also queried and supplemented some missing data. Finally, 18007 sample observations were collected. All continuous variables were quantile tailed at 1% to minimize the effect of outlier.

2.2. Research Hypothesis and Basis for Selection of Assumptions

2.2.1 Comprehensive characteristics of independent directors

Independent directors are important for supervising the company's violations, and their supervision effectiveness is closely related to each one. To ensure the full effectiveness of supervision, the author plans to comprehensively consider the characteristics of each independent director. Therefore, hypothesis 1 is proposed.

H1: The comprehensive characteristics of independent directors are negatively correlated with financial fraud.

2.2.2 Different characteristics of independent directors

(1) Gender

Most researchers agree that women are important for monitoring infractions. According to Liu, Zhang and Campbell's research, the proportion of female directors and the fines levied on businesses are strongly inversely correlated [2-4]. Therefore, hypothesis 2 is proposed.

H2: The more female independent directors, the lower the financial fraud.

(2) Education

Independent directors with higher education have stronger ability to identify and avoid risks which makes them more suitable to be supervisors. Tang and Ma discovered that when these directors with advanced degree failed to perform their duties, the public reacted more violently. It forced them to perform duties faithfully [5, 6]. Therefore, hypothesis 3 is proposed.

H3: Education levels are negatively associated with financial fraud.

(3) Overseas background

Independent directors who have studied or worked overseas have a broader visual field and wider employment options, making them more economically and spiritually independent. They are less tolerant of fraud, so they can stop it at the source. He discovered that they also improved the quality of information disclosed [7]. Therefore, hypothesis 4 is proposed.

H4: Overseas background is inversely correlated with financial fraud.

(4) Academic background

Scholars have rich professional knowledge, are more sensitive to the latest trends in the field, and are able to put forward original opinions. Zhang and Wang think scholars are more independent, so

they can compensate for leadership's shortcomings and enhance supervisory effectiveness [8,9]. Therefore, hypothesis 5 is suggested.

H5: Academic background and financial fraud are negatively correlated.

(5) Financial and accounting background

Hu have proved that accounting independent directors are essential for reducing the level of earnings management. They can find the fraudulent information in the financial report timely and identify the means of earnings manipulation [10]. Therefore, hypothesis 6 is proposed.

H6: The financial and accounting background is negatively related to financial fraud.

2.3. Variable Selection and Processing

2.3.1 An explained variable

Dummy variable 'Fraud' is the dependent variable. If it has fictitious profits, fraudulent assets, false records, significant omissions, false disclosure, or general accounting mishandling, the firm will be considered to have financial fraud in the current year. It receives the value 1. If not, it is 0.

2.3.2 Explanatory variables

Five specific characteristics are selected and averaged. Also using Deng's study, the paper develops a comprehensive characteristic indicator of independent directors based on these five traits [11]. It's shown in Table 1.

To process the data, first, standardize the average:

$$X_j' = \frac{X_j - X_{j,min}}{X_{j,max} - X_{j,min}} \tag{1}$$

X_j: a character variable j; $X_{j,max}$ and $X_{j,min}$: the maximum and minimum; X'_j: the standardization.

Secondly, using the information weight method, the coefficient CV is used to measure the degree of difference in independent directors' characteristics of different companies. The comprehensive characteristic indicator is built using this information.

$$CV_j = \frac{S_j}{M_j} \tag{2}$$

$$CD_{i,t} = \sum_{j=1}^{5} \frac{CV_j}{CV} \times X'_{i,j,t} \tag{3}$$

$CD_{i,t}$: the comprehensive characteristics of company i in period t; S_j and M_j: the standard deviation and mean; $X'_{i,j,t}$ the normalized value of the characteristic j of company i in the year t; CV_j: the difference degree of the feature j; CV: the sum of CV_j.

Table 1. Variable interpretation

Name	Relevant definitions
Financial fraud (Fraud)	If there're financial frauds, it's 1, otherwise it's 0.
CD	The comprehensive indicator of the characteristics.
Gender (Gen)	Male independent director is 0, and female is 1.
Education (Edu)	Doctor and above is 5, the master is 4, undergraduate and junior college are 3 and 2, technical secondary school and below is 1.
Overseas background (Ove) Academic background (Aca) Financial and accounting background (Finback)	If there's the background, it's 1, otherwise it's 0.

2.3.3 Control variables

The following 10 control variables are selected.

Firm size (Size), Debt asset ratio (Lev), ROE, ATO, Board size (Board), Independent director proportion (Indep), State-owned enterprise or not (Soe), Listing period (Listage), Shareholding proportion of the biggest shareholder (Top1), Audited by the Big Four accounting firm or not (Big4).

2.4. Establish Logistic Regression Model

$$Model\ 1: Logistic(p) = P(Fraud = 1) = \beta_0 + \beta_1 CD_{i,t} + \Sigma controls + \varepsilon \quad (4)$$

$$Model\ 2: Logistic(p) = P(Fraud = 1) = \beta_0 + \beta_1 Gen + \beta_2 Edu + \beta_3 Ove + \beta_4 Aca + \beta_5 Finback + \Sigma controls + \varepsilon \quad (5)$$

3. Conclusion of Data Regression Analysis

3.1. Descriptive Statistics

Table 2 shows the results.

Table 2. Descriptive statistics

Variable	Mean	Std.Dev.	Minimum	Maximum
Fraud	0.0554	0.2281	0	1
CD	0.2578	0.4313	0.052	0.605
Gen_M	0.1590	0.3221	0	0.75
Edu_M	4.1580	0.8570	1.75	5
Ove_M	0.1690	0.3909	0	1
Aca_M	0.6710	0.4434	0	1
Finback_M	0.4100	0.4670	0.17	1

According to the table, approximately 5.54% of businesses experienced financial fraud. The CD average is 0.2578, with lowest and highest values of 0.052 and 0.605, respectively. It shows that the CD is quite different and comparing different comprehensive characteristics' influence is easier. Among the specific indicators, female account for 15.9%. Education average is 4.1580, indicating that most have master's degree or above. 16.9% of the independent directors have overseas background. This figures for academic and financial background are 67.1% and 41%.

3.2. Variable Correlation Analysis

The correlation of relevant variables is analyzed to observe whether there is a certain relationship between the variables. Because of sequential variables, Spearman Correlation Analysis is used. Table 3 presents the outcomes.

Table 3. Correlation analysis

	Fraud	CD	Gen_M	Edu_M	Ove_M	Aca_M	Finback_M	Controls
Fraud	1							
CD	-0.0342***	1						
Gen_M	-0.0187**	0.0635***	1					
Edu_M	-0.0534***	0.0492***	0.012	1				
Ove_M	0.0094	0.0529***	-0.0057	0.0021	1			
Aca_M	-0.0457***	0.0414***	0.0156**	0.0792***	-0.0029	1		
Finback_M	0.0211***	-0.0407***	-0.0021	-0.0789***	0.0034	-0.0885***	1	
Controls	***	***	*	***	**	***	***	1

Note: when p<0.10, it is indicated by *; **means p<0.05; *** indicates p<0.01.
The number of * in the following three tables also have this meaning.

Table 3 shows a 1% significant negative association between financial fraud and the CD. For specific indicators, at the significance level of 5%, there is a negative correlation between gender and financial fraud. The 1% significance level exam is passed by academic background. At a significance level of 1%, a positive correlation between financial and accounting experience and the fraud is shown. However, there is little evidence linking having an overseas background to financial fraud, hence H1, H2, H3, and H5 are only speculatively proven. And there is no multicollinearity when the absolute value of Spearman correlation coefficients between the variables are lower than 0.2.

3.3. Univariate Analysis

Next a matched sample t-test according to financial fraud is used to test for the existence of significant differences. The difference is shown in Table 4 between the distinctive indicators of whether fraud has occurred.

Table 4. Univariate analysis

N=1155

	CD		Gen_M		Edu_M		Ove_M		Aca_M		Finback_M	
Fraud	1	0	1	0	1	0	1	0	1	0	1	0
Mean	0.2232	0.2918	0.1474	0.1699	4.0441	4.2821	0.1799	0.1611	0.5927	0.6998	0.3811	0.4308
Difference	-0.0683***		-0.0223**		-0.2383***		0.0197		-0.1075***		-0.0495***	
T value	-4.9378		-2.2962		-8.9983		1.5936		-7.705		-3.4411	

In Table 4, when a company commits financial fraud, CD average, gender, education, academic, and financial backgrounds fall. Gender passes the 5% significance level test, while others meet the 1% level. That is, the five indicators have a significant impact on financial fraud, which has preliminarily confirmed that H1, H2, H3, H5, and H6 are true.

3.4. Regression Analysis

The causal relationships between variables are shown by determining the regression coefficients. Table 5 shows the outcomes of this process.

Table 5. Regression analysis

Variable	Model 1	Model 2
CD	-0.109*** (-3.09)	
Gen_M		-0.0654** (-2.65)
Edu_M		-0.207*** (-5.15)
Ove_M		0.0183 (1.28)
Aca_M		-0.117*** (-3.71)
Finback_M		-0.0791*** (-3.05)
Controls	**	***
LR chi2	1778.44***	1407.66***
Pseudo R^2	0.1778	0.1905
Ind FE and Year FE	YES	YES

The table shows that two models' LR chi2 are 1778.44 and 1407.66, respectively, and their Pseudo R^2 are 0.1778 and 0.1905, indicating that the models' ability to fit the data well. The model is typically sound because of the low significance level.

In Model 1, with a coefficient of -0.109 and a 1% significant level, the CD and financial fraud are inversely associated, supporting H1. In Model 2, gender passes the 5% significance level test. A significant negative link between gender and financial fraud may be seen by looking at the coefficient, which is -0.0654. That's confirms H2. The 1% significance level test is passed by the education and academic background coefficients, which are -0.207 and -0.117, respectively. This demonstrates that financial fraud and education and academic background are highly inversely associated. Scholar independent directors are better and financial fraud decreases as independent directors' educational levels rise. H3 and H5 are supported by this. Moreover, financial fraud is inversely connected with accounting and financial background. They pass the 1% significant level test. The coefficient is -0.0791. This evidence supports H6. The overseas background failed the significance test. It has little to do with financial fraud, therefore, H4 is untrue.

3.5. Robust Test

The author solely utilizes 2016-2020 data for logistic regression analysis to assess the results' robustness. This shortens the time window and eliminates the effect of market and policy changes on model results.

Table 6. Robust test

Variable	Model 1	Model 2
CD	-0.107*** (-3.01)	
Gen_M		-0.0633** (-2.54)
Edu_M		-0.215*** (-5.23)
Ove_M		0.0197 (1.33)
Aca_M		-0.122*** (-3.75)
Finback_M		-0.0780*** (-3.01)
Controls	**	***
Pseudo R^2	0.1878	0.2004
Ind FE and Year FE	YES	YES

In Table 6, the aforementioned findings demonstrate that there is no discernible difference between the regression sample results for 2016-2020 and the initial results. Except for the overseas background, all other indicators passed the test at a level of 1%. The results remain robust and trustworthy even when the sample selection time range is reduced.

4. Discussion

This essay draws the next conclusions based on the empirical findings.

For the comprehensive characteristic of independent directors, it is negatively correlated with the company's financial fraud. The stronger the comprehensive characteristic, the lower the probability of financial fraud.

After performing a regression analysis on the single variable, except for the overseas background of independent directors, gender, education, academic background and financial and accounting background are negatively correlated with the fraud. That is, female, highly educated independent directors, and independent directors with academic, financial and accounting background all had obvious effects on reducing the corporate financial fraud. These conclusions are consistent with the author's assumptions and previous relevant research.

The author speculates that there are two main reasons for the failure of overseas background to pass the significance test. On the one hand, the influence of overseas background on financial fraud is weaker than other characteristics. Although independent directors have worked or studied overseas, they essentially share the same cultural roots and cultural identity as domestic ones. They reenter the workforce in their home countries and become fully integrated. Furthermore, since financial fraud is the consequence of numerous variables, cultural background differences by themselves do not significantly affect the effectiveness of their fraud monitoring. On the other hand, it's also possible that the sample size is insufficient to draw this conclusion.

5. Conclusion

This study demonstrates that the supervisory role of independent directors with different characteristics in corporate financial fraud differs significantly.

Now that more and more pertinent legislation have been passed, the company's board of directors must be made up of individuals who are diverse and comprehensive. Therefore, as an important part of corporate governance, the employment of independent directors should also comprehensively consider the profession, background and experience to improve the comprehensive level of them. This will help to bring into play the active role of independent directors, improve the effectiveness of corporate supervision, suppress financial fraud, insider trading and disclosure of false information, and make up for the shortcomings of the management as much as possible. This is of great significance for promoting the governance structure and operation quality of listed companies, and reducing the occurrence of corporate financial fraud.

The author thinks that additional, in-depth study is still required to fully understand independent directors' function in corporate governance. Other characteristics, including tenure and political affiliation, should be taken into account. Future research may also take into account including additional company kinds to compare the variations in independent director characteristics' influences on financial fraud in various company types. These studies will be of great significance for fully ensuring the of investors' rights and interests and making the capital market more stable and healthy growth.

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