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Research on Early Warning Model of Financial Report Fraud in China

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ABSTRACT

At present, financial report fraud is becoming more frequent with the continuous development of the world economy. How to provide early warning before financial report fraud occurs has become more and more important. The **purpose** of this paper is to set up a logistic regression model, namely an ex-ante warning model, which can provide early warning before financial report fraud occurs, by comparing the governance of financial report fraudulent companies and non-fraudulent ones. First, this paper uses the "fraud triangle" theory as a framework to find the relevant proxy variables for fraud opportunities, fraud pressure, and fraud rationalization. Second, the study uses T-test, Mann-Whitney test and chi-square test to identify statistically significant differences among these proxy variables. Hypotheses were made about the relationship between the coefficient values and the presence of false behavior in the reports. Finally, an ex-ante fraud warning model is set up from the indicators with statistically significant differences, meanwhile the hypotheses regarding the behavior of the indicators and their impact on the model are tested. The overall accuracy of the ex-ante fraud early warning model developed in this paper is 70.9%. How to further debug the model to make the screening of fraudulent companies more accurate is the difficulty and further research direction of the article.
Keywords: financial report fraud; fraud triangle; fraud opportunities; T-test; Mann-Whitney test; chi-square test; ex-ante fraud early warning model

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Исследование модели предварительного предупреждения мошенничества в финансовой отчетности компаний Китая

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АННОТАЦИЯ

В настоящее время мошенничество в финансовой отчетности становится все более частым в связи с непрерывным развитием мировой экономики. Выявление мошенничества в финансовой отчетности до его возникновения становится все более важным. **Целью** данной работы является создание модели логистической регрессии, а именно модели предварительного предупреждения, которая может предупреждать возникновение мошенничества в финансовой отчетности путем сравнения корпоративного управления компаниями-мошенниками и компаниями, не являющимися мошенниками. Во-первых, в данной работе используется теория о треугольнике мошенничества в качестве основы для поиска соответствующих вторичных показателей для возможности, стимула и рационализации. Во-вторых, в данном исследовании использовался Т-тест, тест Манн-Уитни и критерий хи-квадрат для выявления статистически значимых различий между этими вторичными показателями. Были предложены гипотезы о связи между значениями коэффициентов и наличием ложного поведения в отчете. Наконец, модель предварительного предупреждения о мошенничестве строится из показателей со статистически значимыми различиями, в которой проверяются гипотезы относительно полученных показателей и их влияния на модель. Общая точность модели предварительного предупреждения о мошенничестве, разработанной в данной работе, составляет 70,9%. Как в дальнейшем использовать модель, чтобы проверка мошеннических компаний была более точной, является объектом и направлением для следующего исследования.
Ключевые слова: мошенничество в финансовой отчетности; треугольник мошенничества; Т-тест; Манн-Уитни тест; критерий хи-квадрат; модель предварительного предупреждения

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INTRODUCTION

In 1992, China reformed the shareholding system of state-owned enterprises. At the same time, the China Securities Regulatory Commission was also established to manage and supervise listed companies [1].

In this historical context, shares were artificially divided into circulating and non-circulating shares. Non-circulating state-owned shares accounted for over 60% of the total share capital. As a result, the majority shareholder has absolute control over the company [2]. This leads to the board of directors being forced to act in accordance with the views of the shareholders [3]. This shareholding structure reveals the practical urgency of improving the supervision system of Chinese companies. As a result, the Company Law of 1993 regulated the supervisory board system of listed companies. In 1998, the Securities Law came into force, providing regulations for the listing and delisting of companies. 2003 saw the introduction of independent directors in China. In 2006, the Ministry of Finance issued the Code of Practice for Chinese Certified Public Accountants, which laid the foundation for external auditing. In December 2007, the China Securities Regulatory Commission required for the first time that listed companies disclose a summary report on the performance of the audit committee in their 2007 annual reports. As a result, the regulatory system for listed companies in China has basically taken shape [4]. However, in recent years, due to the continuous development of the capital market, financial statement fraud has also emerged and intensified.

Financial statement fraud is the intentional misstatement or omission of figures presented in financial reports or notes to financial statements for the purpose of deceiving users of financial report. It includes: manipulation of the accounting records or supporting documents on which financial reports are based; intentional omission of errors in transactions, events or other material information in financial reports; and intentional misapplication of accounting principles relating to quantities, classifications, presentation or disclosure [5]. Jing Gao believes that financial statement fraud also leads to weak controls and a disorganized corporate governance structure, and deteriorates the quality of its audit function [6].

This paper hypothesises that there is a causal relationship between the corporate governance indicators set up to change as a result of financial statement fraud. This paper first examines the relationship between all independent and dependent variables through univariate analysis (t-test, Mann-Whitney test, chi-square test), and then conducts logistic regression analysis, which ensures more accurate results.

This study takes the special situation of Chinese capital market as the background, takes the basics of corporate governance structure, and uses the relevant proxy variables of the fraud triangle to construct an ex-ante fraud early warning model. The results of the paper can help confirm key companies to observe before fraud occurs. It has theoretical and practical significance for early warning of financial report fraud.

The main objective of this paper is to develop an economic model that can provide early warning before financial report fraud occurs by studying the corporate governance situation. The following are the main goals:

1. Find proxy variables for fraud opportunities, fraud pressure and fraud rationalization in the fraud triangle;
2. Perform statistical tests on the above proxies by T-test, Mann-Whitney test and Chi-Square test;
3. Perform binary logistic regression based on the results of the second step to establish an ex-ante fraud warning model that can provide early warning of financial report fraud.

REVIEW OF THE LITERATURE

Beasley (1996) found that the proportion of outside directors was significantly higher in non-fraudulent firms than that in fraudulent firms [7].

In 1999, the COSO published "Fraudulent Financial Reporting: 1987–1997, An Analysis of U.S. Public Companies", it was noted that only 38% had audit committees composed entirely of outside directors. 65% of audit committee members have no accounting qualifications. In about 60% of the directors are insiders. About two-thirds of the fraudulent companies, CEOs are the same person as the chairman of the board.

Wael Almaqoushi, Ronan Powell (2017) concluded that companies with low audit quality are more likely to have internal accounting problems [8].

Research on the relationship between corporate governance and financial fraud in China started late. Guohong Zhu (2001) concluded that insufficient management incentives and weak accounting controls were the causes of financial statement fraud [9].

Liguo Liu and Ying Du (2003) found that the proportion of corporate shares, the proportion of executive directors, the degree of insider control and the size of the supervisory board are positively related to the likelihood of fraud, while the proportion of outstanding shares is negatively related to the likelihood of fraud [10].

Ning Cai and Lizhen Liang (2003) found that there was a negative relationship between firm size and the likelihood of fraud, while there was a

positive relationship between board size and equity concentration and the likelihood of fraud [11].

Wei Yang and Tao Yao (2006) found that the proportion of national shares and the proportion of outstanding shares were positively related to fraud, the likelihood of fraud was higher when the chairman of the board was also the general manager [12].

Qingxiang Yang et al. (2009) found that the shareholding ratio of the board of directors was significantly and positively related to financial fraud, and the frequency of board meetings was gradually increasing the inhibitory effect on financial fraud [13].

Tiesheng Zhang et al. (2011) found that effective internal control can significantly inhibit the possibility of financial fraud [14].

Xin Lu et al. (2015) found that the average age of the executive team and the high proportion of males made them more likely to commit fraud [15]. The findings of Yang Wang et al. (2021) also suggest that female corporate leaders improve the monitoring capacity of the board of directors and reduce the incidence of financial statement fraud [16].

Jianrong Yao et al. (2019) found that more than 50% of the fraudulent companies were concentrated in 2014–2017 [17]. This is indication that financial statement fraud is becoming more prevalent.

Yue Wang, Yue Wang (2021) built a logistic regression model including Benford factors and obtained an overall accuracy rate of 89.31% [18].

Zhelin Liu and Meifang Chen (2021) found that the risk of financial fraud was lower in listed companies with a larger board of directors and supervisory committee, and higher degree of equity checks and balances; and the risk of financial fraud was higher in companies that were issued with a non-standard audit opinion type two years before the fraud occurred [19].

Chen Xing (2021) found that four indicators, including the proportion of outstanding shares, the number of executives, the total remuneration of the top three executives and the proportion of shares held by the supervisory board, had a positive influence on the company's financial fraud; three indicators, including the proportion of shares held by the largest shareholder, the number of board members and the proportion of independent directors, had a negative influence on the company's financial fraud [20].

Yuming Shen (2021) combined logistic regression models with knowledge graph models. And showed that the relevant information improved the accuracy of logistic regression [21].

The above studies do not present the whole picture of corporate governance in relation to financial fraud. This paper's ex ante early warning model simultaneously looks shareholding structure, board and supervisory board characteristics, the gender and age of management and external auditing, arguably making this study more comprehensive than previous studies. This is the first contribution to this paper. The second contribution is the inclusion of financial variables. It can reflect whether a company will face financial distress prior to fraud. The third contribution is the inclusion of pre-fraud accrual levels and accrual directions in the model, which provide evidence of management's willingness to manipulate financial statement data.

SAMPLE SELECTION AND RESEARCH METHODS

This study utilizes the CSMAR Database[1] to collect 88 listed companies with financial report fraud that were punished for violations from 2010 to 2019. We selected 88 annual data of the first fraud as the fraud sample.

This paper prepares relevant matched samples for each fraud sample:

(1) The same year as the fraud samples;

(2) The same industry as the fraud samples;

(3) Excluding *ST and ST companies;[2]

(4) Excluding companies which have already been punished for financial report fraud;

(5) Excluding companies lack of key data.

According to the criteria above, 249 matched samples were selected for the 88 fraud samples.

In this paper, the binary regression analysis is used to establish an ex-ante early warning model. This paper is a proxy variable for the Pressure, Opportunity, Rationalization of the Fraud Triangle Theory [22] is used to detect the probability of fraud in listed companies.

INDI3CATOR SETTING

(1) Fraud Opportunity Variables

Proportion of outstanding shares (POOS). In China non-tradable shareholders are usually unable to form an effective monitoring system for the management. Therefore, we expect that the POOS is negatively related to the likelihood of fraud.

Percentage of shares present at the annual general meeting (PSAM). Geng Chen et al. found that the higher the PSAM ratio, the stronger the shareholders binding effect on the management [23]. However, shareholders may turn a blind eye to the fraud that has occurred for

[1] GTA CSMAR China Listed Company Database [国泰安CSMAR 中国上市公司数据库].(In Chinese). URL: https://us.gtadata.com/ (accessed on 01.04.2020).

[2] ST means a company with two consecutive years of losses or net assets lower than the par value of the stock, *ST means the company is still in loss in the third (yeardelisting risk).

their own financial interests. Therefore, we cannot expect a relationship between PSAM and the likelihood of fraud.

The number of board meetings during the year (NBMD). There are two contrasting academic views. The first view is that more board meetings indicate more motivated board members, thus it will help to prevent fraud [24]; the other view is that more meetings mean more problems, which increases the possibility of corporate fraud [25]. Considering that boards of directors of listed Chinese companies often act only according to the opinions of shareholders, we expect that NBMD is positively related to the likelihood of fraud.

Board size (BS). Communication and consultation between the board of directors and its functional committees[3] can play a better monitoring role and reduce the possibility of fraud. Therefore, this paper concludes that BS is negatively related to the possibility of fraud.

Size of the board of supervisors (SBS). Yiqi Qi found that the larger of the board of supervisors is, the more fully its supervision performs and the less likely the firm is to engage in fraud [26]. Therefore, this paper expects that the SBS is negatively related to the likelihood of fraud.

The proportion of independent directors (POID). Fangfang Han [27], Jiangkai Zhang et al. [28], and Wenxiu Hu et al. [29] found that people with a larger POID are less likely to commit fraud; Therefore, we expect that POID is negatively related to the possibility of fraud.

The chairman of the board is also the general manager (CPGM). Xiaodan Du ‘s study shows that companies with CPGM are more likely to engage in fraud [30]. Therefore, we expect that fraud is more likely in public companies with CPGM.

Whether a state-owned holding company (WSHC). When a listed company is a state-owned holding company, it can get support from the state, without committing fraud. Therefore, we expect that fraud is more likely in non-state-owned holding companies.

Herfindahl-Hirschman index (HHI). In this paper, the sum of squares of the shareholdings of the top 10 shareholders of a company is used as HHI. There are different academic findings. Mengying Gu [31], Wei Huang et al. [32] found that HHI is negatively related to fraud likelihood. However, Xuetong Tang et al. [33], Yueying Ren and Guohai Lan [34] found that HHI is positively related to the likelihood of fraud. Therefore, we cannot expect the relationship between HHI and the likelihood of fraud for the time being.

Degree of control of the first largest shareholder (Z). The ratio of the shareholding ratio between the first largest shareholder and the second largest shareholder of the company is used as Z. The higher Z, the more likely it is to implement more effective supervision of the executives of the listed company. However, too high Z may also lead to the behavior of the controlling shareholder not being effectively restrained. Therefore, we cannot expect the relationship between Z and the possibility of fraud for the time being.

Companies audited by large accounting firms or companies are subject to dual domestic and foreign audits (LFDA). Cheng Chen found that auditors from large accounting firms have higher audit quality, thus preventing fraud. Dual audits have a similar effect [35]. Therefore, we expect that LFDA is less likely to commit fraud.

As can be seen from (*Tables 1 and 2*), there are significant differences between the fraud sample and the matched sample in terms of the proportion of outstanding shares, the degree of control of the largest shareholder, whether it is state-owned holding, and whether a large accounting firm is responsible for the audit or the company is subject to a dual audit.

(2) Fraud Pressure Variables

Whether loss before fraud (WLBC). If a listed company loses money for two consecutive years, the trading of the listed company’s stock will face the risk of exiting the stock market (ST). Therefore, we expect that listed companies that have already incurred losses before the fraud are more motivated to engage in fraud.

Profitability before fraud (PBC). The profitability of a listed company is critical to its ability to qualify for refinancing; therefore, listed companies with poor profitability before fraud are more likely to commit fraud. We use return on equity (ROE) before fraud as profitability, and we expect that companies with lower ROE are more likely to commit fraud.

Development ability before fraud (DABC). Xiaoqing Zeng and Xiangyong Tang’s found that companies with higher development capacity are more likely to commit financial statement fraud [36]. We choose the increase rate of main business revenue in the year before the fraud as an indicator of firm growth and expect that the higher the indicator, the more likely the firm is to be fraudulent.

Solvency before fraud (SBC). Listed companies with poor solvency often have a strong incentive to commit financial statement fraud. We use the net cash flow from operating activities/current liabilities indicator before fraud as a proxy variable for solvency for our sample firms, and we expect that firms with lower indicators are more likely to be fraudulent.

[3] Including audit committee, nomination committee, remuneration committee, strategy committee, etc.

Table 1

Descriptive Statistical Table of Continuous Fraud Opportunity Variables

Fraud opportunity variables	Fraud or Not	Numbers of observations	Mean	Median	T test (P)	Mann-Whitney Test(P)
POOS	1	88	0.612	0.577	2.874	−1.818
	0	249	0.711	0.772	(0.004)***	(0.069)*
PSAM	1	88	0.504	0.499	−0.923	−0.683
	0	249	0.484	0.499	(0.357)	(0.495)
NBMD	1	88	9.330	9	−0.175	−0.377
	0	249	9.245	9	(0.861)	(0.706)
BS	1	88	8.920	9	0.465	−0.333
	0	249	9.028	9	(0.642)	(0.739)
SBS	1	88	3.591	3	0.985	−1.177
	0	249	3.731	3	(0.325)	(0.239)
POID	1	88	0.352	0.333	0.816	−1.100
	0	249	0.358	0.333	(0.415)	(0.271)
Z	1	88	11.141	2.629	1.292	−2.473
	0	249	18.406	4.398	(0.197)	(0.013)**
HHI	1	88	0.143	0.117	1.530	−1.160
	0	249	0.164	0.123	(0.127)	(0.246)

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

Shares held by management (SRSM). We use the natural logarithm of management's shareholding in the year of fraud as a proxy for management's shareholding. We expect that companies with higher total management shareholdings are more likely to commit fraud.

Change of management (COL). When a company's chairman or general manager changes, the successor often takes drastic steps to clean up old accounts or even resorts to financial statement fraud. Therefore, we expect companies with a change in chairman or managing director during the year to be more likely to be fraudulent.

As seen in *Tables 3* and *4*, there are significant differences between the fraudulent and matched samples in terms of profitability before fraud, development ability before fraud, solvency before fraud, shares held by management, change of management, and whether there was a loss before the fraud.

(3) Fraud Rationalization Variables

Accrual level and accrual direction before fraud (ALBC 1, ALBC 2). Accrual level refers to the difference between accounting profit and net cash flow from operating activities. Beneish found that fraudulent firms are more likely to have persistent positive accruals in the year prior to the fraud [37]. We expect that the higher the accrual level, the more likely a company is to commit fraud, and companies with positive accrual direction before fraud are more likely to commit fraud.

Average age of management (AAOM). The findings of Yuehua Xu et al. suggest that as the average age of the board increases, CEOs become less likely to engage in corporate financial fraud [38]. Therefore, we expect that AAOM is inversely related to the likelihood of corporate fraud.

Gender ratio of management (GROM). Liuye Guo suggest that men are more likely to commit fraud than women [39]. Therefore, we expect that the higher the proportion of males in management, the higher the likelihood of corporate fraud.

As can be seen in *Tables 5* and *6*, there are significant differences between the fraud sample and the matched sample in terms of the mean age of management, the accrual level and accrual direction before fraud.

Table 2

Chi-Square Test Table of Discrete Fraud Opportunity Variables

Fraud opportunity variables	Fraud or Not	Numbers of observations	Mean	Chi-square (P)
CPGM	1	88	0.284	1.435
	0	249	0.221	(0.231)
WSHC	1	88	0.284	7.400
	0	249	0.450	(0.007)***
LFDA	1	88	0.023	7.230
	0	249	0.120	(0.007)***

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).
Note: (1) The number of fraud samples is 88 and the number of matched samples is 249; (2) The significance level of the statistical tests in the table is 5% (i.e., the confidence interval percentage is 95%); (3) T-test is used to test the statistical significance level of the mean of each variable, all two-tailed tests; (4) Mann-Whitney U test for testing the statistical significance level of the median of each variable, all two-tailed tests; (5) ***, **, * represent passing the significance test level of 1, 5, 10%, respectively. *Table 1 – Table 8* are the same as the note.

Table 3

Descriptive Statistics Table of Continuous Fraud Pressure Variables

Fraud pressure variables	Fraud or Not	Numbers of observations	Mean	Median	T test (P)	Mann-Whitney Test(P)
PBC	1	88	0.044	0.059	1.824	-1.716
	0	249	0.079	0.075	(0.071)*	(0.086)*
DABC	1	88	0.749	0.112	-0.992	-1.683
	0	249	0.378	0.164	(0.324)	(0.092)*
SBC	1	88	0.051	0.015	2.407	-4.385
	0	249	0.305	0.136	(0.017)**	(0.000)***
SRSM	1	88	4.460	4.488	2.417	-2.098
	0	249	5.389	6.156	(0.017)**	(0.036)**

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

ESTIMATION OF THE EX-ANTE WARNING MODEL

We selected 13 statistically significant variables from the aforementioned descriptive statistical analysis to build an ex-ante warning model by establishing a multivariate analysis model.

Before building the ex-ante warning model, a multicollinearity diagnosis was performed, and the VIF (Variance inflation factor) of all the indicators are less than 10. Therefore, there is no multicollinearity problem between these variables.

Next, we proceed to develop an ex-ante warning model. Since the dependent variable CORRUPTION is a binary variable and the explanatory variables have both dummy and continuous variables, this paper uses a logistic regression model for analysis:

$$\text{Prob}(\text{fraud}) = \frac{1}{1+e^{-z}}.$$

Z is a linear combination of independent variables.

$$Z = \beta_0 + \beta_1 POOS + \beta_2 WSHC + \beta_3 Z + \beta_4 LFDA + \\ + \beta_5 WLBC + \beta_6 PBC + \beta_7 DABC + \beta_8 SBC + \\ + \beta_9 SRSM + \beta_{10} COL + \beta_{11} AAOM + \\ + \beta_{12} ALBC1 + \beta_{13} ALBC2.$$

Table 4

Chi-Square Test Table of Discrete Fraud Pressure Variables

Fraud pressure variables	Fraud or Not	Numbers of observations	Mean	Chi-square (P)
WLBC	1	88	0.216	13.722
	0	249	0.072	(0.000)***
COL	1	88	0.398	6.204
	0	249	0.257	(0.013)**

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

Table 5

Descriptive Statistical Table of Continuous Fraud Rationalization Variables

Fraud rationalizationvariables	Fraud or Not	Numbers of observations	Mean	Median	T test (P)	Mann-Whitney Test(P)
GROM	1	88	0.833	0.862	0.140	−0.355
	0	249	0.835	0.857	(0.889)	(0.722)
AAOM	1	88	47.767	47.945	1.627	−1.667
	0	249	48.432	48.538	(0.105)	(0.095)*
ALBC 1	1	88	0.017	0.019	−1.700	−2.463
	0	249	−0.002	−0.002	(0.092)*	(0.014)**

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

Table 6

Chi-Square Test Table of Discrete Fraud Rationalization Variables

Fraud rationalization variables	Fraud or Not	Numbers of observations	Mean	Chi-square (P)
ALBC 2	1	88	0.614	3.986
	0	249	0.490	(0.046)**

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

In this paper, the Enter screening covariate method is used to make all the above 13 independent variables enter the logistic regression equation at once, and the regression results and discriminant rates are shown in the following table.

As can be seen from *Tables 7* and *8*, the estimated ex-ante warning model has a chi-square value of 69.529 with a significance level of 0.000, indicating that the overall test of the independent variables included in the model is highly significant. The Nagelkerke R Square is 0.873, indicating that the model has good explanatory power. The discriminant table shows that the discriminant accuracy of the model is 70.9%, which has a good discriminant effect.

Specifically for each explanatory variable, the regression coefficient of the outstanding share ratio and the natural logarithm of the number of management shares are negative and statistically significant, which indicates that the lower their numerical value, the higher the possibility of fraud, as expected. The regression coefficients for state-owned holding companies, large accounting firms auditing or undergoing dual audits and whether the firm had a loss prior to the fraud are negative and statistically significant, which indicates that non-state-owned holding companies, small accounting firms auditing and firms with a loss prior to the fraud are more likely to engage in financial report fraud, in line with expectations.

Table 7

Logistic Regression Results of Logistic Regression Model

Variable	Regression Coefficient B	Wald Test Value	Significance (P)
Constant	−0.455	0.046	(0.831)
POOS	−1.852	11.858	(0.001)***
WSHC	−0.914	7.240	(0.007)***
Z	−0.006	1.829	(0.176)
LFDA	−1.653	4.328	(0.037)**
WLBC	1.436	6.374	(0.012)**
PBC	−1.575	0.962	(0.327)
DABC	0.080	1.883	(0.170)
SBC	−0.518	1.551	(0.213)
SRSM	−0.140	8.096	(0.004)***
COL	0.442	2.095	(0.148)
AAOM	0.033	0.528	(0.467)
ALBC 1	3.450	1.312	(0.252)
ALBC 2	0.114	0.076	(0.783)
Chi-Square	69.529		(0.000)***
Nagelkerke R Square	0.873		
Total number of samples	337		
Number of fraud samples	88		
Number of matching samples	249		

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).

Table 8

Discriminant Table

			Number of observations		⊠
			Fraud or not		Accuracy
			0	1	
Number of observations	Fraud or not	0	178	71	71.50%
		1	27	61	69.30%
Overall accuracy					70.90%

Source: Guotaian CSMAR database of Chinese listed companies. URL: https://us.gtadata.com/ (accessed on 03.07.2022).
Note: The proportion of fraud samples in the total sample of 26% is used as the discrimination point.

CONCLUSION

The ex-ante warning model before fraud is successfully established in this paper by studying the corporate governance situation. It can effectively provide pre-warning for financial report fraud. This paper uses data analysis methods that cleverly combine financial management with knowledge related to econometrics, thus making this paper's financial indicators better than other papers and the model fit and accuracy better. The model fills the

gap of ex-ante warning model before fraud in China, and provides a theoretical basis for establishing key companies to observe before the occurrence of financial report fraud.

This paper begins by successfully finding the proxy variables of fraud opportunity, fraud motive and fraud rationalization by using fraud triangle theory as a framework. Secondly, this paper uses T-test, Chi-Square test and Mann-Whitney test to screen out the corporate governance indicators that affect financial report fraud. Finally, based on the results of the above studies, this paper successfully established an ex-ante fraud early warning model using Enter screening covariates. The overall accuracy of the model reaches 70.9%, which has a good identification effect.

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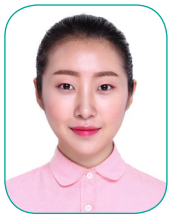

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