

# Analysis of the Relationship between Listed Companies' Earnings Quality and Internal Control Information Disclosure\*

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#### **Abstract**

This article examines the relationship of earnings quality and internal control disclosure information in the sample of 1273 nonfinancial firms in shanghai and Shenzhen Stock Exchange in 2010. Using multiple regression model, we launch an empirical analysis on the relationship between earnings quality and internal control disclosure information. We find a positive relation between earnings quality and internal control disclosure information. The better the earnings quality is, the higher level of the internal control disclosure information will be. This provides a theoretical support to perfect our system of internal control disclosure of information, and to reduce the occurrence of financial fraud.

**Keywords:** Earnings Quality, Internal Control, Disclosure of Information

# 1. Introduction

The cases of financial fraud lead to incalculable losses in these years, which are related to firm's weak system of internal control. Now, both domestic and foreign have issued a series of legal norms. For example, Sarbanes-Oxley (SOX) Act force listed Companies to disclose their internal control information, including internal control deficiencies and internal self-assessment report and external auditor's audit opinion. We formulate two important files: "Shanghai Stock Exchange listed companies internal control guidelines" and "Shenzhen Stock Exchange listed companies internal control guidelines". These files require companies to disclose internal control self-assessment report and comments of external auditor's audit, which greatly improve company's effectiveness of internal control and quality of financial information. Accounting earnings is the score and one of the most important elements in all of the accounting information, which mainly refers to the company's ability of forecasting future net cash flow. Higher earnings quality is the key to the effective function of the market and the insurance of the company's future cash flow. The better

quality of company's earnings inclined to disclose more internal control information and to get more outside investment. Therefore, earnings quality is one of the most important factors to affect internal control information disclosure. In this article, with the analysis of multiple regressions, we examine the relationship of earnings quality and internal control disclosure of information in the sample of 1273 nonfinancial firms in shanghai and Shenzhen Stock Exchange in 2010.

# 2. Prior Research on Internal Control Information Disclosure

Listed companies' internal control information disclosure is mostly voluntary before 2002, but few companies are willing to do so. Since Sarbanes-Oxley (SOX) Act is enforced, many listed companies are forced to disclose their information of internal control, which providing more material and information to scholars who study listed companies' internal control. Researches on internal control information disclosure are mainly concentrated on the following four aspects:

1) The current situation and solutions of internal control information disclosure.

There are lots of researches on the current situation of internal control information disclosure, Mc. Mullen, Ra-

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gahunandan and Rama [1] studied 4154 companies during 1989-1993, suggesting that only 26.5% companies are willing to disclose their internal control information, and that only 10.5% provide their internal control report among those companies with deficiencies on their financial reports. It shows that the proportion of companies voluntarily disclosing their internal control information is little, and that the companies with deficient financial report are more unwilling to provide the internal control self-assessment report. Hermanson [2] also did corresponding empirical research on listed company's internal control information disclosure and got the same conclusion. Minghui Li [3] and Dongmei Qin [4] made related researches on the current situation of internal control information disclosure. They believed that current listed companies' enthusiasm of disclosing internal control information is not strong, and much internal control information was not substantial but formal. Minghui Li [3] also drawn on the experiences of the United States in internal control information disclosure, and provided a series of suggestions and measures of improving internal control information disclosure. Hua Li, Lina Chen [5], Xiaofeng Dai and Jun Pan [6] analyzed the current situation of internal control information disclosure with internal control theories, and pointed out the problems and put forward the corresponding solution. Xinhua Dai and Qiang Zhang [7] mainly did the research on listed banks' internal control information disclosure, finding that our listed banks' system of internal control information disclosure is not standardized and sufficient. They interpreted the corresponding requirements of the US internal control information disclosure set by "Sarbanes-Oxley Act", suggesting China to promote the improvement of listed banks' internal control information step by step. According to relevant provisions of internal control information disclosure required by "Shanghai Stock Exchange Guidelines" and "The Notice on Listed Companies' Annual Report in 2006", Youhong Yang and Wei Wang [8] analyzed the internal control information disclosure of listed companies on Shanghai Stock Exchange in 2006 with descriptive statistics, and found many problems.

2) Impact factors of internal control information disclosure.

Bronson, carcello, Raghunandan [9] and Doyle, Ge, McVay [10] suggested that there is a correlation between corporate identity and internal control information disclosure. Company size, the proportion of institutional investor holding, the number of audit committee and the speed of earnings growth have impact on internal control information disclosure. Many other experts did empirical study on such question. Ge and McVay [11] used a survey method to analyze the sample, discovering that the

disclosure of material defects is related to the complexity of the company but there is no direct correlation with company size and profitability. Jifu Cai [12] made a relevant empirical study of A-share listed companies to find impact factors of listed companies' internal control information disclosure. The results showed that the companies with a better operating performance and higher reliability of financial report are more inclined to disclose its internal control information, and vice versa. This indicates that the company's operating performance and reliability of financial report affect the listed companies' internal control information disclosure. Adrew J. Lcone [13] selected listed companies who disclosed material defects of their internal control information in their annual reports as samples to study the impact factors of internal control information disclosure. The results show that the complexity of corporate structures, the changes in company structure and the inputs to internal control are all the impact factors of internal control information disclosure. Shaoging Song and Yao Zhang [14] studied A-share listed companies on Shanghai and Shenzhen Stock Exchange from 2006 to 2007, finding that there is a correlation between corporate governance characteristics and internal control information disclosure. Audit committee, annual statistics, company size and the place of listing have a significant impact on internal control information disclosure. Bin Wang and Huanhuan Liang [15] studied 1884 listed companies on Shenzhen Stock Exchange between 2001 and 2004. They made use of their rating reports of information disclosure quality to examine the inherent relationship between listed companies' corporate governance characteristics, characteristics of operating condition and information disclosure quality, finding that corporate governance characteristics and characteristics of operating condition have a certain impact on internal control information disclosure.

3) The cost of internal control information disclosure.

The studies on the cost of internal control information disclosure are not very much. J. Efrim, Boritz, Ping Zhang [16] thought that the costs of disclosing internal control information is enormous, and the management did not believe that the benefits of internal control information disclosure would surpass the corresponding costs. Maria [17] analyzed the sample which discloses their internal control information in accordance with SEC requirements, primarily study the relationship between the costs of disclosing internal control information and the effectiveness of the internal control system. It is found that the cost of disclosing deficiencies of internal control information is far more than that of defect-free.

4) Correlation between internal control and earnings quality.

There are many researches on the correlation between

internal control and earnings quality. Doyle [11] studied the relationship between internal control and earnings quality, and found that internal control is a motivation of earnings quality. The studies of Chan [18] and Goh and Li [19] are similar. Chan [18] discovered that earnings management of those who disclose the material defects of internal control has a higher degree but the return on investment is very low. Goh and Li's [19] also found that company's earnings stability can be increased after improving the defects of internal control. Lobo and Zhou [20] made a comparison on companies' discretionary accruals between before implementing "Sarbanes-Oxley Act" and after implementing it, finding that companies' discretionary accruals decreased a lot after the implementation of "Sarbanes-Oxley Act". Doyle, Ge and Mcvay [10] divided the internal control defects into two aspects: corporate level and account level, finding that internal control defects on corporate level is influential to earnings quality, but there is no correlation between internal control defects on account level and earnings quality. Guoqing Zhang [21] selected non-financial A-share listed companies in 2007 as a research object to study the internal control quality on earnings quality. The results have shown that there is no close link between high quality internal control and earnings quality, but company's characteristics and corporate governance factors may affect internal control quality and earnings quality systematically. Chunsheng Fang et al. [22] used questionnaire survey to examine the relationship between internal control system and financial reporting quality, finding that financial reporting quality improved after implementation of internal control system. Jun Zhang and Junzhi Wang [23] selected listed companies on Shanghai Stock Exchange in 2007 as sample, and used adjusted Jones model to calculate discretionary accruals and found that discretionary accruals significantly reduced after the review of internal control. Shengwen Xie and Wenhai Lai [24] selected A-share listed companies on Shanghai Stock Exchange in 2007 and 2008 as samples. They analyzed the relationship between internal control deficiencies and earnings quality by using a paired study, and found that listed companies' internal control information disclosure had an effect on earnings quality.

Based on the above studies, we can see that internal control gets more attention after the promulgation of "Sarbanes-Oxley Act". Current researches centralize on the defects of existing laws and regulations, the current situations of listed companies' internal control information disclosure, the relationship between listed companies' internal control information disclosure and their operating conditions, financial report quality and earnings quality. Among the current studies, most have focused on descriptive statistics and the relationship be-

tween internal control quality and earnings quality, while there is no study use earnings quality as explanatory variable to reflect its effect on internal control information disclosure. Therefore, this article uses earnings quality as main explanatory variable and disclosure of internal control as the dependent variable to do empirical study, which compensate for the lack of current research to some extent.

#### 3. Method

# 3.1. Hypothesis

Hypothesis: the better the quality of earnings is, the higher the level of internal control information disclosure will be.

According to agency theory and signaling theory, corporate trustee has obligation to report relevant information to the corporate capital owners, which give help to the operation of business. In the process of reporting, corresponding information is to pass the corporate relevant signal to the capital market. The signal can make the operator affect the flow of resources in capital market in a certain extent to improve the enterprise's interests. There is the mutually reinforcing relationship between internal control information disclosure and the quality of earnings. A company that can fully disclose its information of internal control means that its managers have a good description of ethics. Meanwhile, a company that can take the initiative to show its internal control information in detail indicates that its company has a higher self-confidence, which will attract more capital market resources, increase its cash flow, enhance the quality of earnings, and improve management capabilities. Conversely, companies with good earnings quality will choose to voluntarily disclose their information of internal control in detail. They can distinguish themselves to the companies with inferior earnings quality and get more favor from investors.

#### 3.2. Variable Selection and Definitions

#### 3.2.1. Dependent Variable

In this paper, we use internal control index to substitute internal control information disclosure (ICD) to test the full of detail of internal control information disclosure. The selection criteria of internal control information disclosure item are "listed company's internal control guidelines on Shanghai Stock Exchange" and "listed company's internal control guidelines on Shanghai Stock Exchange". The eight items of information disclosure are: internal environment, risk assessment, control activists, information and communication, internal oversight, in-

ternal control deficiencies, internal evaluation and external evaluation. The eight items cover almost all major information that stakeholders needed and reflect the real situation of internal control by a large margin, which can accurately reflect the level of companies' internal control information disclosure. The specific method of operation is scoring method, that is, make scores to the eight items. Disclose one item gets one point, otherwise gets zero, then the sum of the eight items is the internal control information disclosure index.

# 3.2.2. Independent Variables

The company's earnings quality is the company's accounting earnings quality. Acruals quality is widely used as a proxy variable of earnings quality. Healy [25] divided accruals into discretionary accruals and non-discretionary accruals. Many scholars believe that the level of discretionary accruals could measure the level of earnings quality. This article makes discretionary accruals as an alternative to earnings quality to be estimated in the modified cross-section Jones Model.

$$TA_{i,t}/A_{i,t-1} = \alpha_1 (1/A_{i,t-1})$$
  
  $+ \alpha_2 [(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}]$   
  $+ \alpha_3 PPE_{i,t}/A_{i,t-1} + e_{i,t}$ 

 $\mathit{TA}_{i,t}$ : the current total accruals of company i,

$$TA_{i,t} = RET_{i,t} - CFO_{i,t}$$

( $RET_{i,i}$  means the current net profits of company i,  $CFO_{i,i}$  means the current cash flow from operating activities of company i).

 $A_{i,t-1}$ : the total assets of company i at the end of last year.

 $\Delta REV_{i,t}$ : the margin of the current main business in-

come and the last year's main business income in company i.

 $\Delta REC_{i,t}$ : the margin of the current accounts receivable balance and the last year's accounts receivable balance in company i.

 $PPE_{i,t}$ : the current total fixed assets of company i.  $e_{i,t}$ : residuals, controllable profits is its absolute value.  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ : general parameters, can be estimated by basic Jones model with the year's data:

$$\begin{split} TA_{i,t} \big/ A_{i,t-1} &= \alpha_1 \left( 1 \big/ A_{i,t-1} \right) + \alpha_2 \, \Delta REV_{i,t} \, \big/ A_{i,t-1} \\ &+ \alpha_3 \left( PPE_{i,t} \big/ A_{i,t-1} \right) \end{split}$$

#### 3.2.3. Control Variables

In addition to the study of the earnings quality on internal control information disclosure, there is a lot of researches about the impact factors of internal control information disclosure. Disclosure of internal control information can't be completely attributed to earnings quality. Many other factors should be taken into consideration as well. Bronson, Carcello, Raghunandan [9] and Doyle, Ge, McVay [10] thought that company's characteristics are related to internal control information disclosure. Company size, the stake holding proportion of institutional investors, the number of attending meeting of audit committee and the income growth all affect the internal control information disclosure. Shaoging Song and Yao Zhang [14] also discovered that there is correlation between corporate governance characteristics and internal control information disclosure. Therefore, this article selects controlling variable from the basic characteristics of company, company performance and corporate governance characteristics. The selected control variables are classified in Table 1.

Table 1. Variables and their measurement method.

Nature of Variables	Name of Variables	Measurement of Variables	Symbols of Variables	
Dependent Variables	Internal Control Information Disclosure	mation Disclosure Score each item of internal control information disclosure, and then sum them		
Independent Variables	Earnings Quality	EQ		
	Return on Equity	Net profits/[(Balance of Shareholders' Equity at the End of Period + Balance of Shareholders' Equity at the End of Period/2] × 100%	ROE	
	The debt-to-asset ratio	Total Liabilities/Total Assets × 100%	DTA	
	Earnings Per Share	Net Income after Tax/All Ordinary Shares	EPS	
Controlling Variables	Board Size	Number of Board Directors	BS	
	The Proportion of Independent Directors	Number of Independent Director/Total Number of Board Directors	ID	
	Ownership Concentration	Proportion of the top five shareholders	OC	
	Internal Audit Agency	Dummy Variable, Establishment = 1; 0 Otherwise	IAC	

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# 1) Return on Equity (ROE):

ROE is rate of return on common stockholders' equity. ROE reflects the income of company's net assets and the company's profitability. The level of ROE reflects the level of strength of corporate profitability. Jifu Cai [12] believed that listed companies with good operating performance tend to disclose their internal control information

#### 2) The Debt-to-Asset Ratio (DTA).

DTA is the reflection of the comprehensive ability. The level of the DTA reflects the strength of company's predictive power. Hossain [26] studied the impact factors of internal control information disclosure twice, He found that debt ratio were positively correlated with the level of disclosure. Thus this article chooses DTA as one of control variables.

# 3) Earnings per Share (EPS).

It is an important indicator of measuring corporation's operating performance. Lang and Lundholm's [27] study showed that the better the company's operating performance is, the higher level of internal control information disclosure will be. Thus this article chooses EPS as one of control variables.

#### 4) Board Size (BS).

BD is an important feature of corporate governance. The size of board may also affect the disclosure of internal control information. Yermack [28] used the data of 500 listed companies in US published on "Forbes" magazine between 1981 and 1991. They made a conclusion that the larger the BD is, the worse the corporate performance will be, so it can't play a good role in the disclosure of information outside.

#### 5) The Proportion of Independent Directors (ID).

Independent directors are always independent and generally the experts in economic, legal, accounting and others, they can express their authoritative opinions on the information listed company should disclosure by standing on the position of investors. They are more likely to affect decision-making of information disclosure and make them inclined to disclose internal control information.

#### 6) Ownership Concentration (OC).

Ownership concentration plays an important role in internal control information disclosure. Wei Zuo and Ye Qiao [29] believed that the higher the ownership concentration is, the greater the risk of major shareholders stealing the interests of minority shareholders will be. Then companies tend to disclose more detailed information to make users understand more about corporate business situations and to protect the interests of minority shareholders. In addition, Hossain [26] found that there is a positive relationship between ownership concentration and the level of the disclosure of internal con-

trol information. Thus the ownership concentration should be one of controlling variables.

#### 7) Internal Audit Agency (IAC).

In general, the companies established IAC may attach more importance to the internal control information disclosure and reduce various types of risk.

# 3.3. Sample Selection

This article selects 1689 listed companies of A-share market main board in Shanghai and Shenzhen Stock Exchange in 2010, to ensure the validity of data, removing 39 financial and insurance companies and 221 companies listed in the year and 61 companies of delisting and suspension of listing and 95 companies of missing data.

The indicators data of sample are from Shanghai Stock Exchange (http://www.sse.com.cn), Shenzhen Stock Exchange (http://www.szse.cn), Huge influx of information network (http://www.cninfo.com) and Ruisi Database (http://www.resset.cn). Data processing using statistic software spss 16.0.

#### 3.4. Model Set

This article chooses multiple linear regression models:

$$ICD = \alpha_0 + \alpha_1 EQ + \alpha_2 ROE + \alpha_3 DTA + \alpha_4 EPS + \alpha_5 BS$$
$$+ \alpha_6 ID + \alpha_7 OC + \alpha_9 IAC + e$$

 $\alpha_0$  is constant term,  $\alpha_i (i = 1, 2, 3, \dots, 8)$  is model regression coefficients, e is residuals.

# 4. Empirical Analysis

# 4.1. Internal Control Information Disclosure Index

This article uses internal control information disclosure index to measure the listed company's internal control information disclosure. According to "listed company's internal control guidelines on Shanghai Stock Exchange" and "listed company's internal control guidelines on Shanghai Stock Exchange", the selected eight items are internal environment, risk assessment, control activists, information and communication, internal oversight, internal control deficiencies, internal evaluation and external evaluation. The results of information disclosure are shown in **Table 2**.

The statistic results shows that there are 468 companies whose ICD equal and less than 4, accounting for 36.76%, and 805 listed companies equal and more than 5, accounting for 63.24%. This indicates that most companies strictly perform internal control information disclo-

Table 2. Internal control information disclosure index.

ICD	Number of Companies	Proportion (%)		
≤4	468	36.76		
≥5	805	63.24		

sure. But we can't ignore the companies that can't execute their internal control information disclosure.

# 4.2. Descriptive Statistical Analysis of Sample

Using regression model to analyze each variable, the descriptive analysis results are shown in **Table 3**.

The descriptive statistics results shows that the maximum of ICD is 8, that is to say all eight items are disclosed; the minimum ICD is 1, it reflects that it didn't basically disclose the internal control information. The mean is 5.12, which shows that the level of the internal control information disclosure of listed companies is good overall and basically observe the two "Guidelines" requirements. The minimum and maximum value of earnings quality has a large gap. The minimum is 0 and the maximum is 12.62, and the mean is 0.4425. The standard value is 0.85258, which shows that different company differs greatly in earnings quality. ROE is from -991.2% to 1295 %. DTA is from 1% to 699.85%. EPS is from -2.48 to 5.35. These big gaps fully reflect the difference in listed companies' performance. In the aspect of corporate governance structure, the differences of all companies are not small. The mean of BS is 12, and the proportion of ID is about 34.689%. Different company has different OC, the top five shareholders of some companies hold nearly 100% shares, which shows that the OC of these companies are very high. The mean of the proportion of top five shareholders is 49.17%, which indicates that the OC of the whole listed companies is very high. As for the establishment of IAC, some companies established and some didn't, which is in the line with reality.

#### 4.3. Correlation Analysis

The correlation analysis of variables and the significance level are shown in **Table 4**.

ICD is negatively related to listed company's EQ and DTA at 1% significance level. The manageability of profit has a negative correlation with the level of internal control information disclosure, and that is to say there is a positive relationship between earnings quality and the level of internal control information disclosure. DTA is negatively related to internal control information disclosure, which is contrary to the findings of Hossain's [26]. ICD is positively related to EPS, OC and the establishment of IAC. This shows that the higher the company's EPS is, the better the company's performance will be, and then the company is more inclined to disclose its internal control information. The major shareholders in the company with high OC are more likely to steal the interests of minority shareholders. The company is more willing to disclose its internal control information in detail. Furthermore, the establishment of IAC can reduce the company's risk, and this also reflects the attention to internal control information disclosure. The ICD shows

Table 3. Descriptive statistical analysis of variables.

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Variable's Name	Minimum	Maximum	Mean	Standard Value
ICD	1.00	8.0	5.1170	1.84108
EQ	0.00	12.62	0.4425	0.85258
ROE	-991.20	1295.00	9.0455	51.73995
EPS	-2.48	5.35	0.3427	0.50329
DTA	1.00	699.85	56.8180	38.15713
BS	5.00	34.00	12.7007	3.90804
ID	6.67	80.00	33.6891	8.57244
OC	0.00	0.99	0.4917	0.16806
IAC	0.00	1.00	0.6237	0.48464

Table 4. Correlation analysis of variables.

	ICD	EQ	ROE	EPS	DTA	BS	ID	OC	IAC
ICD	1.00								
EQ	-0.163**	1.00							
ROE	0.047	-0.047	1.00						
EPS	0.118**	-0.220**	$0.199^{**}$	1.00					
DTA	-0.095**	0.350**	-0.040	-0.115**	1.00				
BS	$0.058^{*}$	0.037	0.023	0.051	0.019	1.00			
ID	0.028	-0.047	-0.009	0.009	-0.012	-0.284**	1.00		
OC	0.082**	-0.193**	$0.063^{*}$	0.230**	-0.047	0.041	$0.076^{**}$	1.00	
IAC	0.674**	-0.120**	0.007	0.028	-0.100**	0.011	0.001	0.009	1.00

This table presents the results for correlation analysis of variables. \*\*, \*Denote significance at the 1% and 5% levels, respectively.

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positive correlation with BS at the 5% significance level. That is to say the company with larger BS is more likely to disclose its internal control information. In addition, ICD also shows positive correlation with ROE and ID. A company with high ROE indicates its good corporate earnings, and then the company will disclose its positive information to attract more investors. Similarly, a company with high proportion of ID can better stand in the position of investors to express its authoritative opinion of the information that listed company should disclose. They are more likely to affect the decision of information disclosure. From the perspective of multi-collinearity, collinearity doesn't exist if the correlation coefficient is not greater than 0.8, according to the study of Hossain, Perera and Rahman [30]. From the results of the variables' correlation analysis, we can see that the correlation coefficient is essentially no more than 0.8. Therefore, we can conclude that there doesn't exist multi-collinearity in the model of multiple regression.

# 4.4. Analysis of Multiple Regression

Regress the selected sample with per-set model, and the results are shown in **Table 5**.

#### 1) Test of Goodness of Fit

The model of goodness of fit is 0.472, which indicates that the explanatory power of regression equation is 47.2%. That is to say, EQ, ROE, EPS, DTA, BS, ID, OC and IAC can make 47.2% explanatory to the level of internal control information disclosure. Thus this model has a strong explanatory power.

# 2) Overall Significance Test of Model.

The F-value of this model is 142.893, with 0.000 accompanying probability less than 0.001. The value of  $F_{\alpha}$  (8, 1264) is significantly less than 142.884 at the signifycance level of 1%. This indicates that independent variables have linear regression relationship with dependent variable. And the regression model is overall significant, which means various factors within model significantly affect internal control information disclosure.

Table 5. Internal control information disclosure on the impact of earnings quality.

Name of Variable	В	T	Sig.
Constant	2.671	10.320	0.000
EQ	-0.135	-2.759	0.006
ROE	0.001	1.088	0.277
EPS	0.253	3.186	0.001
DTA	8.747E-5	0.083	0.934
BS	0.027	2.714	0.007
ID	0.008	1.641	0.101
OC	0.465	1.992	0.047
IAC	2.525	32.291	0.000

Adjusted R Square = 0.472 F Value = 142.884 Sig. = 0.000.

3) Significance Test of Single Regression Coefficient.

EQ is through significance test, indicating that EQ of listed company has a significant impact on internal control information disclosure, which means that the better the earnings quality is, the higher level of the internal control disclosure of information will be. So this article's study hypothesis can be accepted. In the control variables, EPS, BS, the proportion of ID, OC and the establishment of IAC are all through significance test. All of them have significant impact on internal control information disclosure, which consistent with a lot of previous researches. ROE and DTA don't pass the significance test. It shows that the impact is no obvious.

#### 5. Conclusions

The result of the above study shows that EQ of listed company has significant impact on internal control information disclosure. Therefore, if listed companies want to improve the level of their disclosure of internal control information, they should enhance the supervision and management of their EQ so that they can improve the quality of their earnings. A company's EQ is related to not only the level of internal control information disclosure but also the ability of predicting company's future business profitability and its cash flow. Therefore, listed companies must strengthen the supervision and management to their managers, reduce the manipulation of their profits, improve the quality of earnings, and increase the level of internal control information disclosure. Then the incidence of financial fraud must be reduced.

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