

Research on Internal Control and Audit Quality of R & D Information Disclosure

Jiajia Xiao

City University of Macau, China
kristenshao@outlook.com

Abstract: In the economic environment where information acquires rapidly and all kinds of enterprises rush in rapidly, the importance of information disclosure becomes more and more obvious, and becomes an indispensable research object in the field of environmental accounting. It has a profound impact on different aspects of audit quality, and in the corporate governance and development of an irreplaceable position. Effective internal control can reduce audit risk and improve audit quality, and high-quality audit can further ensure the accurate disclosure and transparency of R & D information. Thus, in actuality, businesses should enhance the design of their internal control system, enhance the process for disclosing research and development information, and adopt research-based audit methods to achieve higher audit quality and better corporate governance results. The research shows that the R & D information disclosure of internal control has a positive correlation with audit quality. Additionally, there is a favorable correlation between audit quality and internal control enhancement.

Keywords: Information disclosure, Internal control, Audit quality, R & D.

1. Introduction

Recently evolving, the Information Age provides a robust groundwork for establishing uniform internal management and oversight. According to the statistical data, for different industries of information disclosure, the impact on audit quality is multi-faceted, which undoubtedly provides a solid background for this study. In the research field of R & D information disclosure, especially from the perspective of the standardization and security of corporate governance, R & D Information Disclosure has gradually become the core issue of common concern.

This study aims to solve the problem of internal control to make R & D information disclosure more perfect, improve the information asymmetry, and better effect on audit quality, we hope to have a more comprehensive and in-depth understanding of the field of R & D Information Disclosure. Based on this, this paper first puts forward theoretical assumptions, then constructs a model of R & D Information Disclosure and audit quality, and then introduces internal control as an intermediary variable. Consequently, the article emphasizes the role of internal control in enhancing audit quality through an analysis of the link between audit quality and the disclosure of R&D Information.

2. Literature Review

Although many scholars and experts have conducted in-depth research and discussion, the impact of R & D Information Disclosure on audit quality has not been fully resolved. For example, the 2016 study by Yu Xuemin demonstrated the favorable correlation between audit quality and internal control information disclosure, which led to a series of follow-up studies. However, even on the basis of these studies, research on this dimension of R & D information disclosure is still insufficient. China's securities market is a new market, our country for R & D information disclosure is still some deficiencies (Zhu Lingli & Xu Min, 2017). Zhao Liping, Hu Xiaokang, & Wan Xiaojuan (2017)

studied the present situation of R & D activity revealing details of publicly traded corporations on GEM, and summarized the confusion of disclosure form of R & D Project Progress, etc., some listed companies have not capitalized their R & D Expenditures in accordance with the guidelines, and some listed companies have problems with their R & D data, the author also puts forward some suggestions on strengthening the supervision of external institutions and perfecting relevant laws and regulations (Zhao Liping, Hu Xiaokang, & Wan Xiaojuan, 2017). Some other scholars have also studied the information disclosure of R & D activities of the new third board innovation layer enterprises, concluding that the disclosure of R & D content is incomplete, the lack of standardization, and the repeated filling-in of R & D situation, etc., put forward the suggestion of compliance supervision and perfecting R & D Information Disclosure System (Chen Feng & Yang Shaoliang, 2020). Following the release of annual reports, Wang Xinhong & Liang Ying (2014) conducted an empirical study and discovered a notable positive correlation exists between the intensity of R&D and the value of stocks. (Wang Xinhong & Liang Ying, 2014). According to Wang Yufeng (2011), a steady upward trend is observed in the positive link between stock prices and the caliber of R&D information revealed. (Wang Yufeng, 2011). Through two-tailed correlation tests and regression analyses, Gong Ying and Yu Xuemin (2016) determined that disclosure of internal control information would affect audit quality (Gong Ying & Yu Xuemin, 2016). Wei Biaowen believes that improving internal controls can reduce the chance of financial fraud (Wei Biaowen, 2020A). Additionally, he said that audit time might be reduced in proportion to the quality of internal control information disclosure (Wei biwen, 2020b). Huang Hao and Zhao Ling (2023) found that industry-by-industry disclosure can significantly improve audit quality in general. This positive effect is more obvious when the internal control level of the company is higher and the Auditor has industry expertise. But as the risk of corporate text manipulation increased, the positive effect weakened significantly. Industry-specific

information disclosure can improve information transparency, reduce financial fraud and audit risk, and facilitate auditors to implement audit procedures, and ultimately improve audit quality (Huang Hao & Zhao Ling, 2023). Zhao Jin (2023) found an affirmative link between the revelation of corporate social responsibility information and audit quality through descriptive statistics and correlation analysis (Zhao Jin, 2023)

Following an in-depth examination of current literature, determining if enhanced internal control efficiency leads to better standardization and security in R & D information disclosure, thereby impacting audit quality, remains straightforward. However, there are clear deficiencies in this research, presenting a significant research prospect for this investigation. Current studies have focused more on the present state of R & D Information Disclosure and its influence on innovation or IPO negotiations, while literature on audit quality examines how different types of information disclosures affect audit quality. R & D Information Disclosure plays a crucial role in information dissemination, yet there's a scarcity of research exploring the connection between R & D Information Disclosure and other accounting or auditing domains. Consequently, this research aims to investigate how internal control, specifically R & D Information Disclosure, influences the effects of audit quality elements. Under the circumstances of insufficient external compulsion, due to the fact that revealing R & D information encompasses the confidential trade details of pertinent firms, it can not be determined through internal control to make the information disclosure of R & D More Perfect, whether it can affect audit quality positively, whether it can improve information asymmetry.

3. The relationship between internal control of R & D Information Disclosure and audit quality

3.1. Disclosure of R & D Information

As a micro-economic entity, listed companies need to strengthen their core competence in order to implement the transformation and development strategy. Research and development (R & D) is the basic economic advantage and the most important means to develop technical skills. Hence, it's crucial to make R & D data public.

The disclosure of R & D information shall be clearly stated in the annex, including at least the specific level of annual R & D expenditure and the progress of R & D projects. Revealing this information aids investors and stakeholders in grasping the enterprise's research and development endeavors and prospects, while also boosting its transparency and trustworthiness. Revealing such information can boost investor trust, lower business financing expenses, and elevate the market reputation and brand worth of companies.

High-quality R & D information disclosure can reduce investors' uncertainty about future earnings and reduce their demand for stock returns. When a company discloses its R & D Investment and project progress, it increases the trust of investors and meets the external financing needs of the company. Disclosure of R & D information helps to attract internal and equity financing to support the enterprise's innovation activities. This type of financing is more conducive to long-term growth than debt financing.

On September 28, 2023, the CSRC strengthened the requirement of financial report information disclosure, and required the disclosure of R & D expenditure to be more detailed, but it is still not as good as the relevant system abroad.

3.2. Research Hypothesis

Numerous academics possess an initial evaluation of the current state and significance of research and development information disclosure, as well as an empirical foundation for investigating the influence of diverse forms of information disclosure on audit quality. However, some problems have not been solved: 1. R & D Information Disclosure as an important part of corporate information disclosure, whether there will be a positive relationship with audit quality. 2. Because the disclosure of R & D information involves trade secrets and its own complexity, whether the improvement of the quality of R & D information disclosure will have a negative relationship with the audit quality. Currently, the pertinent rules governing the disclosure of R & D information are incomplete and imperfect. However, the extent of internal control may influence audit quality to some degree, raising the question of whether internal control can serve as a moderating factor to enhance R & D information disclosure quality, thereby impacting audit quality to some degree.

Pursuing this objective, the paper posits the subsequent presumptions:

A positive correlation exists between the disclosure of R & D Information and the quality of audits.

Enhancing the quality of R & D information disclosure inversely correlates with the quality of audits.

A greater Internal Control Information Disclosure Index correlates with enhanced audit quality.

3.3. Model construction

To examine the link between R & D Information Disclosure and the quality of audits, SPSS statistical software is employed for analyzing the sample data:

$$AQ = \beta_0 + \beta_1 R \& D_DISC + \beta_2 MV + \varepsilon CONTROL + \varepsilon \quad (1)$$

To evaluate internal control's moderating influence between R & D Information Disclosure and audit quality, the model is constructed as Formula (2):

$$AQ = \beta_0 + \beta_1 IC + \beta_2 R \& D_DISC + \beta_3 IC * R \& D_DISC + \varepsilon CONTROL + \varepsilon \quad (2)$$

Model variables are shown in Table 1:

Table 1. Summary of model variables

Control variables	Profitability	ROA
	Debt levels	LEV
	Ownership concentration	DCSR
Interpreted variables	Audit quality	AQ
Explanatory variables	Internal Control Index	IC
	Internal Control Information Disclosure Index	ICDI
	R & D disclosure	R&D DISC
	Disclosure of internal control deficiencies	DD

Audit quality, known as Aq, serves as the dependent variable, while the ICDI, or internal control information disclosure index, originates from the Shenzhen-listed businesses' internal control information database. Lev

represents the proportion of overall assets to liabilities, while DCSR indicates the level of equity concentration.

4. Empirical Research

4.1. Sample Selection

Considering the uniformity and comparability of the sample data, the internal control information disclosed in the sample selected 2020-2023 data. Because the disclosure of internal control information of financial listed companies is very different from that of non-financial listed companies, it has some particularity, so it is excluded. After eliminating, 4665 samples were obtained, including 108 ST samples and 4557 non-ST samples.

4.2. Descriptive Statistics

All the sample data were classified according to whether or not St was obtained in Table 2:

Table 2. Descriptive analysis

Variables	Category	Minimum	Maximum	Mean	Standard deviation
AQ	St	0	1	0.6227	0.4836
	N-ST	0	1	0.8678	0.3345
ICDI	St	8.4631	48.366	31.2436	8.8965
	N-ST	3.3686	53.469	36.3428	6.4821
Roa	St	0.3553	29.8554	1.4662	7.8649
	N-ST	0.4467	35.3168	2.3546	10.5587
Lev	St	0.0153	63.9706	1.1683	5.8085
	N-ST	0.0079	8.6107	0.4357	0.2581
DCSR	St	4.0478	71.4688	31.8294	16.1845
	N-ST	2.2188	92.8246	36.2156	15.5521
R & D Disc	St	7.5438	32.1421	22.3238	7.4875
	N-ST	3.4322	45.7338	26.4578	5.2565

The average value of audit quality of St Company is less than non-ST, the standard deviation is more than non-ST, but the result of audit quality is more than 0.5, which indicates that the audit quality of the whole capital market is better. The Disclosure Index of internal control information for ST companies is lower than the average for non-ST companies, indicating that the quality of internal control information disclosure is lower for ST companies than for non-ST companies. This could be due to internal control defects within ST companies or to the relatively low scores of its internal control factors. Irrespective of the underlying reasons, ST companies exhibit a lower average internal control information disclosure index compared to non-ST companies.

In contrast to a non-ST entity, St. Company exhibits a significantly higher ratio of asset liability and a reduced profit margin. The disclosure of R & D data reveals that ST companies hold an average value lower than non-ST companies, suggesting a substandard quality of R & d-related data for ST companies.

4.3. Regression Analysis

The multicollinearity test is conducted on the model's variables to verify the absence of multicollinearity within them. This paper first makes a regression analysis on the linear relationship of variables in non-ST companies, as shown in Table 3:

Table 3. Linear regression results between non-ST company variables

	Sum of squares	Degrees of freedom	Mean Square	F	Significance
Return	.596	1	.596	21.256	.044B
Residual	.056	2	.028		
Total	.652	3			
	Unstandardized coefficients		Normalized coefficient	t	Significance
	B	Standard error	Beta		
Constant	.091	.130		.696	.559
Internal Control Information Disclosure Index	.018	.004	.956	4.610	.044
	Enter Beta	t	Significance	Partial correlation	Collinearity Tolerance
Profitability	-- 114b	-- 282	.825	-- 272	.489
Debt levels	-- 293b	723	.601	-- 586	.345
Ownership concentration	-- 287b	-- 343	.789	-- 325	.110
R & D disclosure	- 1.744B	-- 894	.536	666	.013

Then this paper explores the linear relationship between the variables of St Company, and makes regression analysis by

using SPSS system, and gets Table 4:

Table 4. Linear regression results between ST company variables

	Sum of squares	Degrees of freedom	Mean Square	F	Significance	
Return	.512	3	.171	.	B	
Residual	.000	0	.			
Total	.512	3				
	Unstandardized coefficients		Normalized coefficient		t	Significance
	B	Standard error	Beta			
(constant)	-- 244	.000			.	.
Debt levels	-- 045	.000	-3.358		.	.
Profitability	.098	.000	3.239		.	.
Internal Control Information Disclosure Index	.025	.000	1.159		.	.
	Enter Beta	t	Significance	Partial correlation	Collinearity Tolerance	
R & D disclosure	B000	
Ownership concentration	B000	

From these results we can clearly see that non-ST company's audit quality and other variables of the relationship between the need to explore. Therefore, this paper further explores the relationship between N-ST company's internal control, audit quality and R & D Information Disclosure. A positive correlation is evident as the internal control information disclosure index and audit quality have a correlation coefficient of 0.956. The completer and more detailed the disclosure of internal control information, the lower the audit risk and improve the audit quality. The tolerance of R & D information disclosure is minimal. However, there is a negative correlation between disclosure of internal control defects and audit quality, which is not shown in detail here. This indicates that, although the company has honestly disclosed its internal control deficiencies, the failure to improve the quality of the audit due to the company's acknowledgement of the existence of internal control deficiencies indicates that its internal controls are ineffective, control risks are increased and audit risks are increased, impact on the improvement of audit quality. A positive correlation exists between the quality of audits and the disclosure of R&D information by internal control. Internal control enhancement and audit quality are positively correlated, and information disclosure across industries has a double effect on audit quality. Relatively speaking, all kinds of information disclosure affect audit quality in different ways. The enhancement of the quality of R&D information disclosure does not necessarily have a negative relationship with audit quality. On the contrary, high-quality information disclosure usually promotes the improvement of audit quality. If the information disclosure is not transparent or there are serious internal control problems, this will adversely affect the quality of the audit.

5. Conclusion

Disclosure of R&D information has a direct impact on investors' comprehension of the company's future growth and market transparency. The link between R&D Information Disclosure and audit quality under internal control regulations is the main topic of this article. Good R & D disclosure can

demonstrate a company's innovation capability and long-term development strategy. Standardized disclosure of R & D information will enable companies to better assess the value and market of capital and product markets, reduce asymmetries with corporate actors, further raise share prices and attract more investors. The internal control system assists management in keeping an eye on and assessing how R&D projects are being carried out, ensuring efficient resource allocation and risk management, and lowering the possibility of misinformation being disclosed or improper behavior during the R&D process. Audit quality directly affects the authenticity and reliability of a company's financial statements. High-quality audits provide independent third-party assessment to ensure that information is disclosed in accordance with laws, regulations and accounting standards. The bigger the company, the more likely it is to disclose research and development information. However, The R&D Disclosure Index and a company's profitability are significantly correlated negatively. The existing rules governing the disclosure of R&D information are not flawless and are not totally obligatory. Enterprises should strengthen internal control and improve audit quality to support good R & D Information Disclosure.

References

- [1] Chen Feng, & Yang Shaoliang. (2020). Research on information disclosure of R & D activities of innovation-level enterprises in the new third board of Innovation — taking software and information technology service industry as an example. *Journal of Hebei Software Vocational and technical college*, 22(03), 67-71.
- [2] Gong Ying, & Yu Xuemin. (2016). Research on the influence of internal control information disclosure on audit quality: Based on the data analysis of a-share listed companies in Shanghai Stock Exchange of our country. *International Business Accounting* (02), 75-81.
- [3] Huang Hao, & Zhao Ling. (2023). Industry-by-industry disclosure and audit quality-based on a "Quasi-natural experiment". *Audit study* (03), 136-147.

- [4] Wang Xinhong, & Liang Ying. (2014). Research on value relevance of R & D information disclosure of GEM listed companies. *Business Accounting* (23), 18-21.
- [5] Wang Yufeng. (2011). Value relevance study on disclosure of R & D Expenditure Information. *Financial Theory and practice*, 32(02), 73-78.
- [6] Mark Wei. (2020A). Impact of internal control disclosure on audit quality. *Industrial Innovation Research* (08), 77-78 + 80.
- [7] Wei Biaowen. (2020B). Impact of internal control disclosure on audit quality. *Market for the economy of Technology* (01), 42-43 + 100.
- [8] Zhao Jin. (2023). Impact of corporate social responsibility disclosure on audit quality. *Cooperative Economics and technology* (05), 158-160.
- [9] Zhao Liping, Hu Xiaokang, & Wan Xiaojuan. (2017). Research on disclosure of research and development activities of listed companies on the growth enterprise market. *Friends of accounting* (21), 60-63.
- [10] Zhu Ling, & Xu Min. (2017). A summary of the current situation of R & D information disclosure of listed companies in our country. *Mall modernization* (09), 232-233. Doi: 10.14013/J. CNKI. SCXDH. 2017.09.134