Quality of Internal Control of Listed Companies, Digital Level and CPA Audit Opinion

Xurui Ma
Accounting, Beijing Jiaotong University, Beijing, China

mxrdurant35@163.com

Abstract-The quality of an enterprise's internal control affects the audit workflow, as well as the choice of audit procedures and scope, and ultimately the audit opinion. This paper takes A-share listed companies in 2016-2020 as the research sample and constructs a regression model to test the relationship between internal control quality and audit opinion in the context of digital transformation of enterprises. The empirical results show that internal control quality is significantly and negatively related to non-standard audit opinion, and this paper introduces the moderating variable of corporate digitization level, and the findings show that corporate digitization level can significantly moderate the effect of low internal control quality on the increase of non-standard audit opinion. The improvement of enterprise digitization level helps auditors to issue appropriate audit opinions. The article provides new perspectives on the importance of enterprise digitization construction.

Keywords- Internal control; Audit opinion; Digital level

1. Introduction

There have been numerous incidents of financial fraud in recent years, both domestically and internationally, and companies where financial fraud has occurred often have serious internal control deficiencies. Internal control, as an important part of corporate governance, can curb financial fraud and other situations. The quality of accounting information also depends to some extent on the quality of internal control, the relatively low quality of accounting information is a common feature of companies with defects in internal control [1]. Compared with the company without internal control defects, the company with internal control defects has lower earnings quality [2] and lower earnings persistence [3]. The auditor's determination of the authenticity of a company's financial statements is directly affected by the quality of the accounting information, which in turn affects which type of audit opinion the auditor issues. Currently, far-reaching digital changes are also taking place within enterprises. It is also important to explore the impact of enterprise digital transformation on audit work, so whether the digitization of enterprises can reconcile the relationship between the quality of internal controls and audit opinions and improve audit quality in the context of the rapid development of the digital economy is an important concern of this paper. Therefore, we investigate the relationship between the quality of internal control and audit opinion and the role of digitization of enterprises. This paper enriches the theoretical research on the correlation between digitization, internal control and audit opinion to promote the enterprise to improve the internal control system and digital construction.

BDEIM 2022, December 02-03, Zhengzhou, People's Republic of China

DOI 10.4108/eai.2-12-2022.2328727

2. Materials and Methods

2.1 Internal control and audit opinion

Information asymmetry theory. The internal control system of enterprises requires companies to disclose information about internal control to the public, so the auditor can better grasp relevant information about the audited company during the audit process, properly select audit testing procedures, and issue a high-quality audit report to the auditor. If there is an asymmetric behavior in the acquisition of information about the quality of the company's internal control, it will affect the auditor's judgment and thus also affect the final audit result, i.e., the type of audit opinion.

Agency theory. A well-developed internal control system can have restraint on management's behavior and ensure shareholders' rights and interests. When the internal control of the enterprise is relatively perfect, shareholders have better control over the major business decisions of the company, and it can also help the auditor to make correct judgment on the company's financial condition and operating results during the audit. Therefore, the level of corporate internal control quality has a great impact on the CPA's audit work and is directly related to the audit opinion it issues.

Insurance theory. Enterprise internal control risk is an important factor affecting audit risk. When the quality of internal control of the audited entity is low, the auditor needs to expand the scope of control testing and change the nature and timing of substantive procedures, increasing the workload and audit cost. Audit opinions largely depend on effective internal control operation of listed companies [4][5]. High-quality internal control can weaken the positive correlation between corporate financial restatements and audit expenses [6]. With limited audit costs, a rational auditor should prefer to issue a non-standard audit opinion in order to avoid unnecessary risks.

Based on the above theory, it can be concluded that the internal control situation of a company has a significant impact on the audit opinion. Therefore, corporate internal control will certainly be an important factor for auditors to consider when auditing. In summary, based on the relationship between internal control and auditing and the investigation of the relationship between the quality of internal control and audit opinion, this paper proposes the hypothesis that the quality of internal control is negatively related to non-standard audit opinion. That is, the lower the quality of internal control, the higher the likelihood that the audit opinion issued will be a non-standard audit opinion.

Based on the above theoretical analysis, the first hypothesis is as follows:

H1: The quality of internal control is negatively related to the non-standard audit opinion.

2.2 Enterprise digitization, internal control and audit opinion

Wu, Li and Yang conducted an empirical study on the relationship between information technology capabilities and internal control performance based on the information technology perspective and found that listed companies with superior information technology capabilities have a significant impact on operational efficiency, corporate value and truthful and perfect financial reporting information, but no significant impact on improving asset security and promoting legal compliance in operational management [7]. Combining information technolo-

gy and internal control is an effective way to significantly improve the quality of internal control [8]. From recent studies in academia, it is found that digital technology, as an important management tool and monitoring tool, can effectively cut organizational agency costs. With the gradual popularity of digital technology in modern enterprises, the management ideas and internal control methods empowered by digital technology are also embedded in the daily operations of enterprises, making the management processes such as finance and internal control more transparent.

From this further analysis, on the one hand, as enterprise digitization makes the management process of internal control more transparent, auditors are more able to detect internal control deficiencies and other problems when auditing companies, and the level of enterprise digitization has a certain impact on auditors' audit procedures and decisions, the higher the level of enterprise digitization, the more auditors can detect problems by examining the internal digital systems of enterprises, etc. The higher the level of digitization of the enterprise, the more auditors can identify problems by examining the enterprise's internal digital systems, etc., reducing sampling risk and further improving audit efficiency. On the other hand, when the higher the digitization level of enterprises, the higher the availability of data on business and finance, accounting firms can better analyze the data, make comprehensive use of technical tools such as RPA, combine with ERP applications commonly used by enterprises, develop multi-type and multi-version applicable automated data extraction and cleaning tools, start from the underlying data, and conduct in-depth business, financial and operational data on the massive Audit analysis and more accurate audit opinions are given. In addition, studies have shown that the application of blockchain technology by enterprises may make auditors perceive that audit risks are increased, which leads to auditors becoming more cautious and investing more audit resources, thus making them more inclined to issue non-standard audit opinions and increase audit fees [9].

Based on the above theoretical analysis, the second hypothesis is proposed:

H2: The level of digitization of enterprises significantly enhances the negative relationship between internal control quality and non-standard audit opinions.

2.3 Study design

2.3.1 Variable definition

The Dependent variable is the type of audit opinion (Opinion), which is denoted by OP. Audit opinion is divided into two levels, which are standard audit opinion and non-standard audit opinion. The standard audit opinion is the standard unqualified opinion, except for the non-standard audit opinion. It includes unqualified opinion plus matter paragraph; qualified opinion; qualified opinion plus matter paragraph; unable to express an opinion; and adverse opinion. When a listed company obtains a standard audit opinion, OP takes 0. When a non-standard audit opinion is obtained, OP takes 1.

The explanatory variable is internal control quality, and scholars at home and abroad measure the quality of internal control of companies from different perspectives, such as using internal control elements as internal control quality evaluation criteria and establishing evaluation index systems. The article on the assessment of internal control quality selects the internal control index of listed companies released by Shenzhen DIB to measure, which is expressed by

ICQ. The following six control variables are selected in this paper: company size (Size), whether loss occurs (Loss), firm size (Big4), financial leverage (Lev), profitability (ROA) and nature of enterprise (SOE).

The moderating variable is Digitization level. Based on the definition of digital transformation, this paper measures the digitization level of enterprises by the proportion of intangible assets related to digital transformation to the total intangible assets. Specifically, when the intangible assets details include keywords related to digital transformation technologies such as "software", "network", "client", "management system", "intelligent platform" and related patents, and then a number of digital technology intangible assets of the same company in the same year are added up to calculate the proportion of intangible assets in the current year, which is the proxy variable of the degree of digital transformation of the enterprise [10].

Table 1 provides the definition of variables.

Table 1 Variable Definition

Variable Definition	**Variable Symbols**	**Variable Name**	**Variable Definition**
Dependent variable	OP	Type of audit opinion	Non-standard audit opinion of 1, standard audit opinion of 0
Explanatory variable	ICQ	Quality of internal control	According to Shenzhen DIB Internal Control Index / 100
Moderator	Digital	Digitization level	Ratio of digital assets to total intangible assets
Control variables	Size	Enterprise size	Natural logarithm of the company's total assets at the end of the period
	Loss	Whether loss	Loss for the year is 1, no loss is 0
	ROA	Profit Level	Return on Assets
	Big4	Firm Size	Audit firms are Big 4 for 1, non-Big 4 for 0
	Lev	Gearing ratio	Ratio of liabilities to total assets at the end of the year
	SOE	Nature of business	1 for state-owned enterprises, 0 for non-state-owned enterprises

2.3.2 Econometric model

In this paper, the type of audit opinion (OP) is the explanatory variable, internal control quality (ICQ) is the explanatory variable, and six indicators of firm size (Size), whether loss occurred (Loss), firm size (Big4), financial leverage (Lev), profitability (ROA), and nature of the firm (SOE) are used as control variables. The following regression model (1) for audit opinion was constructed.

$$OP_{it} = \alpha + \beta 1 ICQ_{it} + \beta 2 Size_{it} + \beta 3 Loss_{it} + \beta 4 Big4_{it} + \beta 5 Lev_{it} + \beta 6 ROA_{it} + \beta 7 SOE_{it} + \sum Year + \sum Industry + \varepsilon \quad (1)$$

Based on the regression model (1), the regression model (2) is constructed by adding the moderating variable Digital level (Digital) and the cross product term of internal control quality and Digital level (ICQ*Digital).

$$OP_{it} = \alpha + \beta 1 ICQ_{it} + \beta 2 Digital_{it} + \beta 3 (ICQ * Digital)_{it} + \beta 4 Size_{it} + \beta 5 Loss_{it} + \beta 6 Big4_{it} + \beta 7 Lev_{it} + \beta 8 ROA_{it} + \beta 9 SOE_{it} + \sum Year + \sum Industry + \varepsilon \quad (2)$$

2.3.3 Robustness test

In order to verify the stability of the model, the robustness of the constructed model is tested. The digital level of the enterprise is measured by referring to previous scholars' research and using big data and text mining technology to digitize the annual reports published by listed companies with corresponding keyword word frequency, which is used as a proxy variable for enterprise digitization. Firstly, this paper obtains the annual reports of A-share listed company through Python language; secondly, this paper constructs a digitization keyword lexicon by referring to previous literature, and then counts the digitization-related word frequencies in the annual reports of listed companies through manual collation and Python word splitting algorithm to form an initial index to measure the digitization of enterprises. The larger the index is, the higher the degree of digitization of enterprises.

3. Results & Discussion

3.1 Descriptive statistics

Table 2 shows the descriptive statistics of the main variables in this paper, the total number of valid data is 10220. the mean value of OP is 0.0187, the non-standard audit opinion in the sample accounts for about 1.87% of the total number of samples. The mean value of ICQ is 6.502, the minimum value is 1.155, and the maximum value is 9.413. the mean value of Loss is 0.093, indicating that about 9.3% of the sample is in loss status. the mean value of Big4 is 0.0648, indicating that about 6.48% of the companies have hired Big 4 accounting firms to provide audit services for them. Further correlation analysis of the variables was performed. The absolute value of the correlation coefficient between the variables is 0.622 at the maximum and 0.018 at the minimum, both of which are less than 0.8. If the absolute value of the correlation coefficient between the variables is less than 0.8, it can be concluded that there is no significant correlation. There is no covariance among the variables, which meets the requirements of regression analysis for the selection of variables.

Table 2 Descriptive statistics

Descriptive Statistics	**N**	**mean**	**sd**	**min**	**max**
OP	10,220	0.0187	0.135	0	1
ICQ	10,220	6.502	0.833	1.155	9.413
SOE	10,220	0.312	0.463	0	1
Big4	10,220	0.0648	0.246	0	1
Loss	10,220	0.0930	0.290	0	1
ROA	10,220	0.0350	0.0840	-1.629	0.786
Digital	10,212	0.133	0.250	-7.51e-05	1
Lev	10,220	0.421	0.194	0.00836	1.687
Size	10,220	22.43	1.332	17.95	28.52
Number of code	3,042	3,042	3,042	3,042	3,042

3.2 Analysis of regression results

Regressions are performed on model (1) and the results are shown in column (1) of Table 3. The results of regression 1 were analyzed and it was found that the five variables of company internal control quality (ICQ), gearing (Lev), firm size (Size), and whether the firm had a loss for the year (Loss), and nature of the firm (SOE) passed the significant test and had a significant correlation with the type of audit opinion. However, the variables of company's return on assets (ROA) and firm size (Big4) are not significantly correlated with the type of audit opinion.

The coefficient of Internal Control Quality (ICQ) is -0.035, which is negatively correlated at 1% level of significance. Hypothesis H1 was verified that there is a significant negative correlation between the quality of the company's internal control and the issuance of a non-standard audit opinion by the CPA, and as the quality of the company's internal control over management improves, the company is less likely to be issued a standard audit opinion. In addition, the coefficient of firm size (Size) is significantly negative; the coefficient of balance sheet ratio (Lev) is significantly positive; the coefficient of nature of enterprise (SOE) is significantly negative; the coefficient of whether loss (Loss) is significantly positive; and the coefficients of profitability level and firm size are not significant

Regressions are performed on model (2) and the results are shown in column (2) of Table 3. Column (2) adds the level of digitization at the firm level (Digital) and the cross product term for the quality of internal control and the level of digitization (ICQ*Digital). The results show that the quality of internal control is significantly negative at the 1% level, and the interaction terms for the digitization and the quality of internal control of the firm are each significantly negative at the 1% level. This result indicates that, based on hypothesis H1, the development of enterprise digitization can effectively enhance the negative relationship between internal control quality and non-standard audit opinions, and enterprise digitization can enhance the negative effect of low internal control quality on non-marked audit opinions to some extent.

The above findings support the hypothesis H2 of this paper.

Table 3 Regression results of audit opinion, internal control quality, and digital level

Regression Results	**OP**	**OP**
ICQ	-0.035***	-0.029***
	(-17.48)	(-13.17)
Digital		0.313***
		(6.49)
ICQ*Digital		-0.050***
		(-6.83)
Size	-0.046***	-0.046***
	(-8.19)	(-8.24)
ROA	-0.009	0.016
	(-0.38)	(0.70)
LEV	0.166***	0.166***
	(8.10)	(8.09)
SOE	-0.019*	-0.020*
	(-1.70)	(-1.84)
Loss	0.021***	0.023***

	(3.60)	(3.91)
Big4	0.004	0.003
	(0.23)	(0.20)
Constant	1.195***	1.162***
	(9.83)	(9.54)
Industry Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
Observations	10,220	10,212
R-squared	0.088	0.095
Number of code	2,997	2,994

3.3 Robustness analysis

Firstly, the measurement method of the variables is changed. Referring to previous scholars' studies, the annual reports published by listed companies are digitized using big data and text mining techniques to measure the frequency of corresponding keyword words as a proxy variable for enterprise digitization. Table 4 shows the regression results after replacing the measurement method of digitization level.

Table 4 Regression results of audit opinion, internal control quality, and digital level

Regression Results	**OP**
ICQ	-0.028***
	(-12.52)
Digital2	0.003***
	(7.37)
ICQ*Digital2	-0.0004***
	(-6.85)
Size	-0.046***
	(-8.39)
Lev	0.163***
	(8.27)
SOE	-0.021*
	(-1.88)
Loss	0.021***
	(4.11)
Big4	0.002
	(0.09)
Industry Fixed Effects	YES
Year Fixed Effects	YES
Observations	10,220
Number of code	2,997
R-squared	0.095

4. Conclusions

The article explores the impact of internal control quality on CPA audit opinions using A-share listed companies from 2016-2020 as a research sample, and the empirical results show that (1) both internal control quality and non-standard audit opinions are significantly and

negatively related, and the impact of the quality of internal control on the type of audit opinion issued is significant. Firms with lower quality of internal control are more likely to be issued non-standard audit opinions, while firms with higher quality of internal control are more likely to receive standard audit opinions. (2) The level of corporate digitization significantly moderates the effect of low internal control quality on the increase of non-standard audit opinions.

The conclusions of this paper have the following two aspects of enlightenment: (1) Enterprises should strengthen the construction of internal control system and improve the quality of accounting information. (2) The digital transformation of enterprises has an impact on the audit work. The digital transformation of enterprises can help auditors find the problems of the audited companies. Auditors should take advantage of the improved digital level of enterprises.

Acknowledgments

I am really grateful to all those who devote time to reading this thesis and give me much advice, which will benefit me in my later study.

References

[1] Liu,B.(2013)The Impact of Internal Control Based on Financial Reporting on the Quality of Accounting Information: Empirical Evidence from Listed Companies in Shenzhen Stock Exchange. Economic and Management Research, 11:101-108.

[2] Lei,Y., Wu, J.Y., Sun, H.(2013) The Impact of Internal Control Audit on the quality of Accounting Earnings -- Based on the Empirical analysis of Shanghai A-share listed companies. Accounting Research, 11:75-81+96.

[3] Xiao,H.,Zhang,G.Q.(2013)Internal Control Quality, Earnings Sustainability and Corporate Value. Accounting Research ,05:73-80+96.

[4] Sun,L.H.(2013)Research on the influence of Internal Control Effectiveness of Listed Companies on Audit opinions. Communications on Finance and Accounting, 24:30-32.

[5] Zhou,S.W.,Chen,F.X. (2016)Research on the Impact of the Effectiveness of Internal Control of Listed Companies on Audit Opinions.China Internal Audit, 03: 6-8.

[6] Deng,X.J.,Hou,F.T. (2022)Quality of Internal Control, Restatement of Financial Statements and Audit Costs. Communications on Finance and Accounting,19:38-43.

[7] Wu,J.N., Li,Y.L., Yang,Y.D. (2014) Information technology capability and internal control performance - empirical evidence from listed companies in Shanghai and Shenzhen. Financial Research, 01: 69-72.

[8] Zhou,W.H.,Liu,Y.L.(2022) Management ability, enterprise digitization and internal control quality.Economic and Management Research,05: 110-127.

[9] Xu, R.Y., Wang, J.X., Wang, Y.T.(2022) Does the application of blockchain technology influence auditor behavior? Accounting and Economic Research ,06:38-50.

[10] Qi, H.J., Cao, X.Q., Liu, Y.X. (2020) The impact of digital economy on corporate governance - based on the perspective of information asymmetry and managers' irrational behavior. Reform, 04:50-64.