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The Impact of Enterprise Digital Transformation on Audit Risk

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Abstract: This study examines the impact of corporate digital transformation on audit risk using A-share listed companies in Shanghai and Shenzhen from 2015 to 2022 as a sample. The findings reveal a significant negative correlation between the degree of digital transformation and audit risk, indicating that digital transformation helps mitigate audit risks. Mechanism analysis demonstrates that digital transformation effectively reduces uncertainties and risk exposure in auditing by enhancing internal control quality, increasing information transparency, and optimizing data management. Further mediation analysis shows that internal control quality partially mediates the relationship between digital transformation and audit risk. The research provides empirical evidence for enterprises to strengthen internal control systems and audit risk governance during digital transformation, while also offering guidance for audit institutions to optimize audit procedures and improve audit quality in the digital era.

Keywords: Digital Transformation; Audit Risk; Internal Control

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1.Introduction

In the context of the rapid development of the global digital economy, digital transformation has become a crucial pathway for enterprises to enhance competitiveness and achieve sustainable development. Digital transformation not only involves the application of technology and the restructuring of business processes, but also profoundly impacts organizational structures, management models, and information disclosure mechanisms. Meanwhile, as a key component of corporate governance and information disclosure supervision, auditing has seen significant changes in its risk characteristics and response strategies due to the digitalization process of enterprises.

Audit risk typically denotes the risk of material misstatements in financial statements that auditors fail to detect. As corporate digital transformation progresses, the audit environment has grown increasingly complex. On one hand, the application of digital tools enhances data accessibility and processing efficiency, enabling auditors to identify risks more accurately. On the other hand, technical complexity, system integration risks, and emerging business models may introduce new audit uncertainties. Existing research has yet to reach a consensus on the relationship between digital transformation and audit risk, and lacks systematic empirical testing based on large sample sizes.

In view of this, this paper takes China A-share listed companies from 2015 to 2022 as samples to empirically examine the impact of digital transformation on audit risk and its underlying mechanisms. The possible contributions of this study are

as follows: First, it provides empirical evidence in the field of auditing for the governance effects of digital transformation; Second, it reveals the mediating role of internal control quality between digitalization and audit risk; Third, it offers references for corporate managers, auditors, and regulatory authorities to optimize risk management in the process of digitalization.

2.Literature Review

2.1 Multifaceted Economic Effects of Digital Transformation

As the digital economy continues to evolve, the economic implications of corporate digital transformation have been extensively examined. Research demonstrates that digital transformation can restructure business processes and organizational frameworks, thereby enhancing operational efficiency [1], stimulating innovation potential[2], and positively impacting business performance and information transparency [3]. These findings provide a foundation for understanding the macro-level value of digital transformation, while also suggesting its potential to influence external audit activities through improvements in information environments and governance structures.

2.2 Traditional and Emerging Influencing Factors in Audit Risk Research

In the field of audit risk studies, scholars widely acknowledge that audit risks are influenced by multiple factors, with internal control quality being recognized as the core determinant[4]. Meanwhile, the advancement of enterprise informatization and enhanced data traceability help mitigate information asymmetry, thereby creating favorable conditions for audit risk management [5]. However, when examining the direct relationship between digital transformation and audit risks, existing literature presents divergent conclusions and explanatory approaches.

2.3 Research Progress and Disputes on the Relationship Between Digital Transformation and Audit Risk

Some studies suggest that digital transformation can reduce audit risks by strengthening internal controls and improving information quality and transparency[6]. For instance, scholars using a multivariate difference-in-differences model found that digital transformation enhances audit quality [7]. Other research highlights that digital tools improve data verifiability and processing efficiency, enabling auditors to more accurately identify and assess risks[8]. However, other studies focus on the complexities and emerging risks associated with digital transformation. Challenges such as technological dependency, system integration difficulties, data security issues, and the ambiguity of new business models may increase uncertainties in audit processes[9]. Particularly when corporate digitalization intertwines with business diversification strategies, auditors may face heightened judgment challenges and risk exposure[9]. These divergences indicate that the impact of digital transformation on audit risk is not unidirectional, and its specific effects may depend on the degree of transformation, implementation approaches, and the governance context both internally and externally within enterprises.

In conclusion, while existing research has examined audit risk from both risk reduction and risk complexity perspectives, a systematic and consistent analytical framework remains lacking regarding the underlying mechanisms of digital transformation's impact on audit risk—particularly whether and how internal control quality plays a pivotal role in this process. Moreover, robust empirical testing based on large-scale samples is still absent. Addressing these gaps and comparative shortcomings in the literature, this study aims to clarify the primary relationship pathways between digital transformation and audit risk. Focusing on the internal control system as a core governance component, we propose the following research hypotheses.

3.Theoretical Analysis and Research Hypotheses

3.1 The Direct Impact of Enterprise Digital Transformation on Audit Risk

The implementation of digital transformation has effectively addressed information asymmetry within the company. Through digital technologies, internal and external data are now interconnected, while blockchain technology ensures data immutability, enhancing both usability and reliability while boosting transparency. This system also provides management with timely access to critical data, significantly improving decision-making capabilities. Furthermore, the shift in information storage formats has streamlined data acquisition, tracking, and monitoring processes. Auditing institutions now gain clearer

insights into corporate information, leading to substantially improved audit efficiency and reduced risks. Based on the aforementioned analysis, the first hypothesis is proposed:

H1: The higher the degree of enterprise digital transformation, the lower the audit risk

3.2 The Mediating Effect of Internal Control Quality

Corporate digital transformation integrates digital technologies with internal systems like financial platforms and OA approval workflows, achieving data transparency, visualization, and automated processes. This reduces manual intervention, streamlines interdepartmental coordination, promptly identifies internal control deficiencies, enhances control effectiveness, and lowers the likelihood of material misstatement risks, thereby mitigating audit risks. Based on the above analysis, the second hypothesis of this paper is proposed:

H2: Digital transformation indirectly reduces audit risk by improving internal control quality

4.RESEARCH DESIGN

4.1 Sample Selection and Data Sources

This study examines A-share listed companies in Shanghai and Shenzhen from 2015 to 2022, with data sourced from the CSMAR database and annual reports. The dataset underwent the following processing: (1) Exclusion of ST and *ST (Special Treatment) samples; (2) Filtering out financial sector samples; (3) Removal of samples with missing data. After these filters, 14,864 samples remained. All continuous variables were trimmed by 1% tails to eliminate the influence of outliers.

4.2 Variable Definition and Model Design

4.2.1 explained variable

Audit Risk (AR). Audit risk refers to the potential for improper audit opinion issuance when material misstatements in financial reports are either undetected or inadequately assessed during the audit process. We consider that companies bear higher audit risks, and we label such cases as AR when they experience financial statement restatements or receive penalties from the Securities and Futures Commission (SFC).

4.2.2 explanatory variable

Enterprise Digital Transformation (EDT). Following the research methodology of Wu Fei et al. [3], this study constructs a feature lexicon based on five core keywords (artificial intelligence, big data analytics, cloud storage, blockchain, and digital technology applications). By quantifying the frequency of relevant terms in corporate annual report texts, it measures the extent of enterprise digital transformation.

4.2.3 controlled variable

This paper selects the company size, equity multiplier 2, property ratio, total assets net interest rate, return on equity, operating income growth rate, annual stock yield 1 as control variables, the specific variables are defined as shown in Table 1.

4.2.4 model design

To investigate the potential impact of enterprise digital transformation on audit risk and test Hypothesis 1, we constructed a model.

$$AR=\beta+\beta EDT+\sum Control+\varepsilon$$

Table 1 variable-definition

	Variable name	variable symbol	variable-definition
explained variable	audit risk	AR	1 for financial statement restatements, 0 otherwise; 1 for penalties by the CSRC, 0 otherwise
explanatory variable	Enterprise digital transformation	EDT	The annual report's full text was used as the database, and the frequency of matching was calculated by the feature word spectrum composed of five categories of keywords.

	Variable name	variable symbol	variable-definition
controlled variable	company size	Size	Logarithm of total assets
	Equity multiplier 2	EM2	average balance of total assets/average balance of owner's equity
	equity ratio	DER	total liabilities at the end of the year / owner's equity at the end of the year
	Net interest rate on total assets: 1	ROA1	average balance of net profit/total assets
	The net interest rate on total assets is 2	ROA2	average balance of EBIT/total assets
	return on equity	ROE	net profit/average balance of owner's equity
	increase rate of business revenue	Growth	Current year's operating revenue minus the previous year's operating revenue
	Annual return on individual stocks 1	Annual return on individual stocks 1	annual return on individual stock considering reinvestment of cash dividend

5.Empirical Analysis

5.1 Descriptive statistics

Table 2 Descriptive statistics of main variables

variable name	sample capacity	mean	standard deviation	least value	crest value
AR	14,864	8.01e-05	0.000224	0	0.00374
EDT	14,864	0.384	0.486	0	1
Nk	14,864	641.7	107.1	0	941.3
Size	14,864	22.72	1.295	19.74	26.45
EM2	14,864	2.097	1.088	1.061	8.906
DER	14,864	1.123	1.164	0.0542	9.171
ROA1	14,864	0.0338	0.0631	-0.373	0.247
ROA2	14,864	0.0490	0.0676	-0.365	0.287
ROE	14,864	0.0558	0.126	-0.926	0.437
Growth	14,864	0.145	0.403	-0.658	4.024
Annual return on individual stocks 1	14,864	0.102	0.511	-0.689	3.643

Table 2 presents the descriptive statistics of key variables. The audit risk (AR) of the dependent variable shows minimal variation, with an average close to zero, indicating that the sample companies generally have low audit risks. The independent variable, company digital transformation level (EDT), averages around 0.4, suggesting moderate digital transformation among the sample companies. However, the large standard deviation highlights significant variations in digital transformation levels across firms. The internal control quality of enterprises is notably high, with an average score above 600, indicating that the sample companies demonstrate strong internal control quality.

5.2 Regression Analysis

This study investigates the potential impact of corporate digital transformation on audit risk through multivariate regression

analysis using Model (1). Table 3 presents the regression results. The three-star rating for Enterprise Digital Transformation (EDT) obtained from the data indicates significance at the 1% level, demonstrating that digital transformation significantly reduces audit risk. These findings strongly support Hypothesis H1.

Table 3 Results of Enterprise Digital Transformation and Audit Risk

variable	AR
EDT	54.16***
	(19.35)
Size	0.0109***
	(0.00401)
EM2	-0.0372**
	(0.0179)
DER	0.0360**
	(0.0170)
ROA1	-1.975***
	(0.449)
ROA2	1.268***
	(0.386)
ROE	0.184**
	(0.0922)
Growth	-0.0347***
	(0.00977)
Annual return on individual stocks 1	-0.0851***
	(0.00650)
Constant	0.178**
	(0.0900)
trade	YES
Observations	14,860
R-squared	0.023

Note: *, **, and *** indicate significance at the 10%,5%, and 1% levels, respectively; the t-values in parentheses are White-corrected.

5.3 Mediating Regulation of Internal Control Quality

In the initial examination of mediating effects, we investigated how corporate digital transformation (EDT) influences internal control quality (NK). The regression results showed that the EDT coefficient was 110.6, statistically significant at the 1% level (T-value = 39.19), indicating that internal control quality scores increased substantially with higher levels of digital transformation.

Table 4 Results of the mediation effect test 1

variable	Nk
EDT	110.6***
	(39.19)
Constant	6.425***
	(0.00933)
Observations	14,863
R-squared	0.001

Table 5 Results of the Mediation Effect Test 2

variable	AR
Nk	-0.000443***
	(3.70e-05)
EDT	49.49***
	(17.70)
Constant	0.664***
	(0.0242)
Observations	14,863
R-squared	0.010

In the second mediation test, we further examined whether internal control quality (NK) mediates the relationship between enterprise digital transformation (EDT) and audit risk (AR). The internal control quality coefficient was-0.000443, which was statistically significant at the 1% level (T-value = 3.70E-05), indicating a negative correlation between internal control quality and audit risk. Meanwhile, the EDT coefficient was 49.49, also significant at the 1% level (T-value = 17.70), further confirming the negative relationship between enterprise digital transformation and audit risk. This also validates Hypothesis H2.

6.Conclusion

This study examines the impact of corporate digital transformation on audit risk through an analysis of data from A-share listed companies in Shanghai and Shenzhen from 2015 to 2022. The findings reveal that enhanced digital transformation significantly correlates with reduced audit risks. By strengthening internal controls, improving information transparency, and refining data management, digital transformation helps mitigate uncertainties and risk points in audit processes, thereby lowering audit risks.

This study demonstrates that corporate digital transformation can significantly reduce audit risks, with this effect partially achieved through enhanced internal control quality. The conclusions indicate that digital transformation is not merely a technological upgrade but also a critical pathway to improving corporate governance and audit quality.

For enterprises, it is crucial to enhance internal control systems in tandem with digital transformation, while strengthening data governance and system security. Auditors should proactively leverage digital tools to optimize audit procedures and improve adaptability to digital environments. Future research could further investigate the heterogeneous impacts of digital transformation on audit risks across industries and ownership structures, as well as the moderating role of auditors' professional competence in this process.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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