

Dose Enterprise Digital Transformation Affect Quality of Accounting Information?

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Abstract. The development of the digital economy has strengthened enterprises' capabilities in handling, transmitting, and regulating data assets, which significantly affects the quality of their accounting information. This study takes Chinese A-share listed companies from 2012 to 2021 as samples to explore the impact of enterprise digital transformation on the quality of accounting information. The research reveals a significant positive correlation between enterprise digital transformation and accounting information quality, a relationship that remains valid after a series of robustness tests. Further investigation indicates that enterprise digital transformation enhances accounting information quality through two pathways: improving internal control quality and attracting analyst attention. This effect is more pronounced in companies with lower management ownership ratios, research and development investments, and market competition intensity. The study provides empirical evidence for the connection between enterprise digital transformation and accounting information quality, contributing to promoting high-quality development, enhancing competitiveness, and adapting to market changes for businesses.

Keywords: Digital Transformation; Quality of Accounting Information; Internal Control; Analyst Attention.

1. Introduction

Since the 18th National Congress of the Communist Party of China, the central leadership has attached great importance to the development of the digital economy and introduced a series of policies to drive its growth. The role of the digital economy as a "stabilizer" and "accelerator" of the national economy has become more prominent. Digital transformation plays an actively facilitating role in the high-quality development of manufacturing enterprises (Wang Pengfei et al., 2023; Yang Zhen, 2023) [1, 2], and it is an inevitable path for microeconomic entities to achieve high-quality development (Wu Fei et al., 2021) [3]. The impact of enterprise digital transformation on the quality of accounting information has become a highly discussed topic in the academic community.

Existing literature on enterprise digital transformation and the quality of accounting information mainly focuses on the following aspects. Factors Influencing Enterprise Digital Transformation: Scholars have identified key factors influencing enterprise digital transformation. These include the effect of peer influence (Hu Chunhui et al., 2023; Zhang and Du, 2023) [4, 5] and policy driving (Wu Fei et al., 2021; Lin et al., 2018) [1, 6]. Factors Affecting the Quality of Accounting Information: Literature on accounting information quality examines both internal and external factors. Internal factors mainly include board effectiveness (Ye Bangyin and Wang Xuan, 2022) [7], top management individual factors (Lan Ziwen et al., 2023) [8], and executive compensation (Xu Jingchang and Li Zhaopeng, 2022) [9]. External factors primarily encompass accounting standards and regulations (DeFond, 2010; Liu Xiaohua and Wang Hua, 2015) [10, 11], customer stability (Qiu Baoyin and Cheng Bo, 2022) [12], and market-driven resource allocation mechanisms (Ma Lijun et al., 2022) [13]. Economic Consequences of Accounting Information Quality: Existing research indicates that accounting information quality influences various economic outcomes for businesses. These outcomes include transaction costs, merger and acquisition efficiency (Marquardt and Zur, 2015) [14], monetary policy transmission (Armstrong et al., 2019) [15], and stock prices (Li Qingyuan et al., 2021) [16]. Overall, the intersection of enterprise digital transformation and the quality of accounting information is a topic of considerable academic interest, with researchers exploring various aspects and implications of this relationship.

The contributions of this study are as follows: Firstly, existing research has predominantly focused on the influence of digital transformation on corporate management changes (Qi Yudong and Xiao Xu, 2020)[17] and performance levels (Yao Xiaotao et al., 2022)[18], with little attention paid to its impact on accounting information quality. Against the backdrop of the deep integration between the digital economy and traditional physical enterprises, this study explores the influence of digital transformation on accounting information quality, thereby expanding the scope of research on the economic consequences of digital transformation. Secondly, while previous research has mostly examined factors influencing accounting information quality from the perspectives of internal governance structure (Ye Bangyin and Wang Xuan, 2022)[7] and management heterogeneity (Zhou Weihua and Liu Yilin, 2022)[19], this study investigates the impact of digital transformation on accounting information quality from the viewpoint of the enterprise's digital strategic transformation. This enriches the research on factors influencing accounting information quality and extends the current research domain. Thirdly, this study clarifies the mechanism behind the interaction between enterprise digital transformation and accounting information quality. It reveals that digital transformation enhances accounting information quality through the pathways of improved internal controls and increased analyst attention. Lastly, this study finds that the promotion of accounting information quality by digital transformation is more significant in companies with lower management ownership ratios, lower research and development investments, and lower market competition intensity.

2. Theoretical Analysis and Research Hypotheses

2.1 Digital Transformation and Accounting Information Quality

This paper argues that digital transformation can impact the quality of accounting information within enterprises in several ways:

Firstly, data accuracy and consistency: Digital transformation gives rise to a "data chain" that spans from data collection and insights to dynamic solutions (Adner et al., 2019)[20]. This contributes to higher accuracy in financial reporting, thus enhancing the quality of accounting information. Secondly, internal control and risk management: Digital transformation can enhance a company's internal control environment and risk management system. Furthermore, digital transformation also positively affects a company's innovation capacity by reducing transaction costs and alleviating financing constraints, thereby enhancing innovation ability (Fan Hongzhong et al., 2022)[21]. This enhanced innovation capability helps strengthen core competitiveness and sustainable profitability, which in turn has a positive impact on accounting information quality (Zhang Zhang et al., 2018)[22].

In summary, this paper proposes the following hypothesis:

H1: Holding other conditions constant, enterprise digital transformation significantly enhances the quality of accounting information.

2.2 Digital Transformation, Internal Control, and Accounting Information Quality

Digital transformation also has a positive influence on both internal control and accounting information quality. Firstly, the application of digital technology enables companies to monitor risks in a more timely manner. Through real-time data collection and analysis, potential risks can be swiftly identified and addressed, reducing operational risks and losses (Wang Shouhai et al., 2022)[23]. Secondly, digital transformation optimizes communication and information dissemination within enterprises, establishing robust internal control systems conducive to effective implementation. Weak internal control systems can lead to greater risks. Companies with ineffective internal control systems tend to face more accounting errors compared to those with effective systems. Weak internal control systems can result in more unintentional and intentional errors in accrual estimation processes (Choi, 2021) [24]. Therefore, digital transformation improves the quality of internal control within enterprises, consequently enhancing the accuracy and reliability of accounting information and overall accounting information quality.

In conclusion, the following hypothesis is proposed:

H2: Enterprise digital transformation improves accounting information quality by enhancing internal control.

2.3 Digital Transformation, Analyst Attention, and Accounting Information Quality

Digital transformation aligns with the development trend of the digital economy era, making it easier to attract analyst attention in the capital market (Lei Guangyong et al., 2022)[25]. Previous studies have shown that after a company undergoes digital transformation, analyst coverage significantly increases (Chen et al., 2022)[26], leading to enhanced accuracy of publicly available information. This offers analysts more usable public information, enabling them to adjust earnings expectations promptly and provide investors with more accurate earnings forecasts. Digital transformation broadens the scope of financial information. Apart from traditional structured data, it provides unstructured financial accounting information such as videos, images, audio, and text files, enriching the content of financial information (Warren et al., 2015)[27].

Analyst attention also influences companies through supervision and incentive mechanisms. Media often play a role in external supervision and improving corporate governance in the capital market (Dyck et al., 2008)[28]. This form of supervision can prompt companies to prioritize digital transformation and accounting information quality to meet the needs of investors and analysts, thereby enhancing corporate governance and transparency.

In conclusion, the following hypothesis is proposed:

H3: Enterprise digital transformation improves accounting information quality by enhancing analyst attention.

3. Research Design

3.1 Research Sample and Data Source

Since China's digital economy framework took shape in 2012, often referred to as the "Year of Big Data," this study is grounded in data from Chinese A-share listed companies on the Shanghai and Shenzhen stock exchanges from 2012 to 2021. The data underwent the following preprocessing steps: (1) Exclusion of financial and insurance companies; (2) Exclusion of samples categorized as ST, ST*, PT; (3) Exclusion of samples with missing variables. Additionally, a 1% trimmed mean was applied to continuous variables, resulting in a final dataset containing 21,566 valid observations. Financial data for the study was sourced from the CSMAR database, while the internal control index was obtained from the Shenzhen Dib Big Data Research Center.

3.2 Variable Definitions and Model Construction

3.2.1 Measurement of Accounting Information Quality

Accounting information quality encompasses the quantity and quality of company announcements, with the aim of providing decision-makers with sufficient information that reflects the company's operational situation (Zhang Xinmin et al., 2019)[29]. This study adopts the modified Jones model to calculate the absolute value of discretionary accruals $DA_{i,t}$ as a measure of earnings management level, which is used to assess accounting information quality. The larger the discretionary accruals, the greater the tendency toward earnings management, indicating poorer accounting information quality.

The calculation is as follows: First, the model is used to estimate the accounting quality for each company. A regression is performed by industry and year to obtain regression coefficients that are then applied to Equation (2) to derive non-discretionary accruals NDA . This value is then substituted into Equation (3) to obtain the modified discretionary accruals (DA).

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_0 \frac{1}{A_{i,t-1}} + \beta_1 \frac{\Delta REV_{i,t}}{A_{i,t-1}} + \beta_2 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{i,t} \quad (1)$$

$$NDA_{i,t} = \hat{\beta}_0 \frac{1}{A_{i,t-1}} + \hat{\beta}_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \hat{\beta}_2 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) \quad (2)$$

$$DA_{i,t} = \frac{TA_{i,t}}{A_{i,t-1}} - NDA_{i,t} \quad (3)$$

Among them, TA represents total accruals, calculated as operating profit minus net cash flow from operating activities; NDA represents non-discretionary accruals; ΔREV stands for changes in operating revenue; ΔREC stands for changes in accounts receivable; $PPE_{i,t}$ represents the net amount of fixed assets in period t .

3.2.2 Measurement of Enterprise Digital Transformation

Enterprise digital transformation refers to the process of using a combination of digital technologies to bring about significant changes and improvements within a company, with the aim of achieving transformational goals and creating value (Yao Xiaotao et al., 2022)[18]. Existing research employs two main approaches to measure enterprise digital transformation. The first approach considers both the degree of digital transformation within a company and the digitalization level of the region. This is evaluated using indicators such as the proportion of intangible assets represented by digital technology-related assets and digital environment indicators to assess the levels of digital transformation and regional digitalization (Qi Huaijin et al., 2020; Zhao Chenyu et al., 2021)[30; 31]. The second approach involves utilizing text analysis methods to process annual reports of listed companies. This method involves extracting digital-related keywords from these reports and using standardized word frequencies as proxy variables to measure the degree of digitalization (Wu Fei et al., 2021)[3].

In this study, the approach similar to Wu Fei et al.'s is adopted to measure the degree of enterprise digital transformation. Python was utilized to compile and organize annual reports of companies listed on the Shanghai and Shenzhen stock exchanges. Relevant keywords associated with digital transformation were extracted. These indicators were standardized and then mapped to a range of 0-100 using the cumulative distribution function of the standard normal distribution, resulting in a composite indicator, labeled as "Dig" for measuring the degree of enterprise digital transformation.

3.2.3 Model Construction

Based on the research hypotheses of this paper, the following baseline model is established to examine the correlation between accounting information quality and enterprise digital transformation. The coefficient β_l represents the relationship between accounting information quality and the degree of digital transformation

$$DA_{i,t} = \beta_0 + \beta_1 Dig_{i,t} + \gamma Control_{i,t} + \sum Ind + \sum Year + \varepsilon_{i,t} \quad (4)$$

Drawing on the research works of Peng Kai (2021)[32], Zhang Duolei and Zou Rui (2021)[33], among others, Model (4) includes control variables such as firm size (*Size*), leverage (*Lev*), return on assets (*Roa*), cash flow ratio (*Cashflow*), firm growth (*Growth*), ownership percentage of the largest shareholder (*Top1*), ownership percentage of management (*Mshare*), proportion of independent directors (*DP*), CEO-chair duality (*Dual*), and ownership nature (*Soe*). Additionally, industry and year fixed effects are also controlled for in the model. Variable definitions can be found in Table 1.

Table 1. Variable definition table

Variables		Definition
Dependent Variable	<i>DA</i>	Calculated and absolute value using the modified Jones model by Dechow et al. (1995)[34]
Independent Variable	<i>Dig</i>	Index of Enterprise Digital Transformation
Mediating Variables	<i>IC</i>	Dib Internal Control Index Score
	<i>Analyst</i>	Natural logarithm of the number of analysts following the company plus one
	<i>Size</i>	Natural logarithm of total assets of the company
	<i>Lev</i>	Total liabilities / Total assets ratio
	<i>Roa</i>	Net profit / Total assets ratio
	<i>Cashflow</i>	Net cash flow from operating activities / total assets ratio of the company
	<i>Growth</i>	(Current year's operating revenue - Last year's operating revenue) / Last year's operating revenue
Control Variables	<i>Top1</i>	Number of shares held by the largest shareholder / Total number of shares
	<i>Mshare</i>	Number of shares held by management / Total number of shares at the end of the period
	<i>DP</i>	Number of independent directors / Total number of directors in the board
	<i>Dual</i>	The value is 1 when the Chairman and CEO are the same person, otherwise it is 0
	<i>Soe</i>	The value is 1 when the company is a state-owned enterprise, otherwise it is 0
	<i>Ind</i>	Controlling for industry fixed effects
	<i>Year</i>	Controlling for year fixed effects

4. Empirical Results

4.1 Descriptive Statistics

Table 2 presents the results of descriptive statistics. From Table 2, it can be observed that the mean and median of earnings management level (*DA*) are 0.063 and 0.044, respectively. The minimum value is 0.001, and the maximum value is 0.355, which is consistent with the findings reported by Zhai Huayun and Li Qianru (2022)[35] as well as Zhang Duolei and Zou Rui (2021)[34]. The average value of the selected corporate digital transformation index is 37.060, with a standard deviation of 10.573, indicating a relatively large variation within the sample. The minimum value is 23.220, and the maximum value is 65.331, showing a wide range of values within the sample, similar to the results of Zhu Ying et al. (2023)[36]. The descriptive statistics of the control variables are in line with the findings of Peng Kai (2021)[32] and Zhang Duolei and Zou Rui (2021)[33].

Table 2. Descriptive statistics of the key variables

Variables	N	Mean	SD	Min	Med	Max
<i>DA</i>	21566	0.063	0.063	0.001	0.044	0.355
<i>Dig</i>	21566	37.060	10.573	23.220	34.880	65.331
<i>Size</i>	21566	22.255	1.271	20.140	22.050	26.330
<i>Lev</i>	21566	0.404	0.192	0.056	0.397	0.836
<i>Roa</i>	21566	0.046	0.057	-0.184	0.042	0.214
<i>Cashflow</i>	21566	0.052	0.063	-0.123	0.050	0.233
<i>Growth</i>	21566	0.166	0.330	-0.482	0.115	1.812
<i>Top1</i>	21566	0.339	0.146	0.084	0.317	0.737
<i>Mshare</i>	21566	0.154	0.201	0.000	0.026	0.680
<i>DP</i>	21566	0.377	0.053	0.333	0.364	0.571
<i>Dual</i>	21566	0.298	0.458	0.000	0.000	1.000
<i>Soe</i>	21566	0.306	0.461	0.000	0.000	1.000

Table 3 presents the correlation coefficients among the key variables. Both the accounting information quality indicator *DA* and the corporate digital transformation index *Dig* are significant at the 1% level and exhibit a negative correlation, thus providing preliminary support for the hypotheses proposed in this study. Additionally, this study examined multicollinearity using Variance Inflation Factors (VIFs), and the Mean VIF value was 1.330, indicating the absence of multicollinearity among the variables.

Table 3. Correlation coefficients of the key variables

	<i>DA</i>	<i>Dig</i>	<i>Size</i>	<i>LEV</i>	<i>ROA</i>	<i>Growth</i>	<i>Mshare</i>	<i>Top1</i>	<i>SOE</i>	<i>Dual</i>	<i>Cashflow</i>
<i>DA</i>	1										
<i>Dig</i>	-0.00100	1									
<i>Size</i>	0.064***	0.020***	1								
<i>Lev</i>	0.044***	0.037***	0.550***	1							
<i>Roa</i>	0.096***	0.058***	0.019***	0.346***	1						
<i>Growth</i>	0.092***	0.021***	0.025***	0.029***	0.275***	1					
<i>Mshare</i>	0.036***	0.053***	0.393***	0.299***	0.150***	0.091***	1				
<i>Top1</i>	0.034***	0.155***	0.178***	0.050***	0.116***	-0.013*	0.097***	1			
<i>Soe</i>	0.057***	0.118***	0.397***	0.275***	0.094***	0.094***	0.479***	0.232***	1		
<i>Dual</i>	0.022***	0.077***	0.192***	0.133***	0.042***	0.036***	0.238***	0.030***	0.292***	1	
<i>Cashflow</i>	0.148***	0.078***	0.059***	0.160***	0.426***	0.026***	-0.00900	0.097***	-0.002	0.013*	1

Note: *, **, and *** represent significance levels at 10%, 5%, and 1%, respectively, in the statistical analysis.

4.2 Baseline Regression

Table 4 primarily examines the impact of the degree of digital transformation on the quality of accounting information. The regression results indicate that only the coefficients of *Dig*, *Size*, *Lev*, *Roa*, *Growth*, *Soe*, and *Cashflow* are significantly non-zero, and their t-statistics are all significant. Specifically, after controlling for industry and year fixed effects, the coefficient of *Dig* is -0.0002, suggesting a significant positive relationship between digital transformation and the quality of accounting information, confirming H1; the coefficients of *Size*, *Lev*, *Roa*, *Growth*, *Soe*, and *Cashflow* are -0.0034, 0.0177, -0.0760, 0.0206, -0.0057, and -0.1017, respectively, indicating that company size, leverage, profitability, growth, state ownership proportion, and cash flow significantly influence the risk level.

Table 4. Baseline Regression Results

Variables	(1)	(2)
<i>Dig</i>	-0.0002*** (-3.6999)	-0.0002*** (-4.4209)
<i>Size</i>	-0.0036*** (-7.9692)	-0.0034*** (-7.2534)
<i>Lev</i>	0.0159*** (4.9445)	0.0177*** (5.3248)
<i>Roa</i>	-0.0751*** (-4.3877)	-0.0760*** (-4.3785)
<i>Growth</i>	0.0209*** (11.1816)	0.0206*** (10.7924)
<i>Mshare</i>	0.0013 (0.5311)	0.0022 (0.876)
<i>Top1</i>	0.0007 (0.2443)	0.0007 (0.2235)
<i>Soe</i>	-0.0058*** (-5.3163)	-0.0057*** (-5.1258)
<i>Dual</i>	0.0000 (0.0439)	0.0003 (0.3495)
<i>Cashflow</i>	-0.1069*** (-8.3764)	-0.1017*** (-7.8041)
<i>DP</i>	0.0213*** (2.6222)	0.0195** (2.411)
<i>_Cons</i>	0.1355*** (14.3490)	0.1374*** (12.5594)
<i>Ind</i>	No	Yes
<i>Year</i>	No	Yes
<i>N</i>	21,566	21,566
<i>Adjusted R²</i>	0.044	0.064

4.3 Robustness Test

4.3.1 Replacing Independent Variables

The conclusion about the impact of digital transformation on accounting information quality might be influenced by measurement errors in digital transformation. Therefore, this study divides the enterprise digital transformation index into groups based on industry medians and replaces the independent variable with a binary variable representing digital transformation. The impact of digital transformation on accounting information comparability is reexamined. The regression results are presented in Column (1) of Table 5, which shows that the coefficient of enterprise digital transformation on accounting information comparability remains significant at the 1% level.

4.3.2 Replacing Dependent Variable

Accounting conservatism is one of the fundamental principles in accounting that involves the high-level professional choice of accounting policies (Han et al., 2014)[37]. The principle of accounting conservatism requires companies to adopt a cautious approach when recognizing earnings. To mitigate potential measurement error issues in this study, the *CScore* model and the *Basu* model are employed for robustness tests. The test results, shown in Columns (2) and (3) of Table 5, indicate that the enterprise digital transformation index is significantly negatively correlated with both *Basu* and *CScore* at the 1% level.

4.3.3 Narrowing Sample Interval

In 2017, the State Council of China issued the "Guiding Opinions on Deepening the Development of 'Internet Plus Advanced Manufacturing'," which aims to promote the integration of the Internet and advanced manufacturing, facilitating digital transformation and upgrading of enterprises. Therefore, this study shortens the sample period to 2017-2021 and re-examines the impact of digital transformation on accounting information quality. The regression results, as shown in Column (4) of Table 5, reveal that the coefficient of digital transformation on accounting information quality remains significant at the 1% level.

4.3.4 Independent Variable Lagged by One Period

This study finds that digital transformation has a significant positive impact on the quality of enterprise accounting information. However, there might be a potential time lag effect that could influence the accuracy of the results. To mitigate this impact, this study performs a regression analysis with a one-period lag of the enterprise digital transformation index, as shown in Column (5) of Table 5. The results indicate that the impact of digital transformation on the quality of enterprise accounting information remains significant at the 5% level.

4.3.5 PSM-DID

To address endogeneity issues, this study employs the Propensity Score Matching with Difference-in-Differences (PSM-DID) method. This approach matches treated and control groups with similar characteristics, aiming to control for external factors' interference on causal effects. Based on the degree of digital transformation, the sample is divided into treatment and control groups. Samples without successful matches are removed, and then the Fixed Effects estimation method is employed for DID estimation. The results, as shown in Column (6) of Table 5, indicate that the impact of digital transformation on the quality of enterprise accounting information is negative and statistically significant at the 1% level. This suggests that digital transformation significantly enhances the quality of enterprise accounting information.

4.3.6 Instrumental Variable Method

Following the methodology of Xiao Hongjun et al. (2021)[38], the average value of digital transformation within the same region and industry is selected as the instrumental variable. Through instrumental variable tests, the Kleibergen-Paap LM statistic is 1833.12 (p-value 0.00), indicating no underidentification problem, and the Cragg-Donald Wald F statistic is 3355.99, substantially

exceeding the 10% Stock-Yogo critical value (16.38), indicating no weak instrumental variable threat. Therefore, the chosen instrumental variable is reasonable and effective.

Columns (7) and (8) in Table 5 display the regression results using the 2SLS instrumental variable approach. In the first-stage regression, the coefficient of the instrumental variable (*AvgDigital*) is 0.9664 and significantly positive at the 1% level, indicating a strong correlation between the instrumental variable and digital transformation. In the second-stage regression, the coefficient of digital transformation (*Dig*) is significantly negative at the 1% level, further confirming the research conclusion of this study.

Table 5. Robustness Test Results

Variables	(1) <i>DA</i>	(2) <i>CSore</i>	(3) <i>Basu</i>	(4) <i>DA</i>	(5) <i>DA</i>	(6) <i>DA</i>	(7) <i>Dig</i>	(8) <i>DA</i>
<i>Dig</i>		-0.0083*** (-9.4489)	-0.0073*** (-13.0559)	-0.0002*** (-4.0767)				-0.0004*** (-3.1719)
<i>Digital</i>	-0.0037*** (-4.3463)				-0.0003** (-2.2689)	-0.0036*** (-3.1049)		
<i>AvgDigital</i>							0.9664*** (51.9769)	
<i>_Cons</i>	0.1341*** (-12.3473)	3.6032*** (-16.2513)	0.0195 (-0.2045)	0.1266*** (-9.7268)	0.2158*** (-4.4579)	0.1292*** (-8.1332)	-28.8205*** (-18.7699)	0.1350*** (12.2411)
<i>Ind</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	21,566	19,379	19,379	13,207	18,088	11,515	21,540	21,540
<i>R²</i>	0.064	0.108	0.161	0.078	0.056	0.067	0.360	0.063

5. Mechanism Test

5.1 Internal Control

Corporate digital transformation, by improving and upgrading internal controls, can enhance internal management practices and the quality of accounting information. Sound internal control quality further influences the quality of accounting information and reliability of financial information while reducing financial risks (DeFond, 2010)[10].

Drawing from relevant research, the Internal Control and Risk Management Database (*DIB*) is used to obtain disclosed internal control indices as a proxy variable for internal control quality. This is employed to examine whether corporate digital transformation affects accounting information disclosure quality through internal controls. Column (1) in Table 6 reports the results of the mediation regression between internal control quality and accounting information quality. In Column (1), the regression coefficient of corporate digital transformation on accounting information disclosure quality is -0.0002, significantly negatively correlated at the 1% level. This indicates that corporate digital transformation contributes to enhancing the quality of accounting information disclosure. It can be observed that internal control quality and corporate digital transformation are significantly positively correlated at the 1% level, suggesting that corporate digital transformation contributes to improving a company's internal control quality.

5.2 Analyst Attention

Digital transformation enables companies to release standardized and structured information more easily, which can be readily identified and analyzed by external stakeholders. This increased visibility drives heightened attention from analysts (Wu Fei et al., 2021)[3]. First, in response to analysts' information demands, companies tend to enhance the transparency, providing accurate, comprehensive, and timely financial data. Second, as the number of analysts tracking a company increases, external monitoring of listed companies strengthens, reducing earnings management practices (Li Chuntao et al., 2016)[39]. Analyst attention attracts broader attention from other market participants, triggering a spillover effect of supervision (Liu Bai et al., 2021)[40]. Third, the sustained

attention of analysts compels companies to emphasize auditing and internal control, thereby enhancing the credibility and accuracy of financial reporting.

In summary, analyst attention influences accounting information quality through various channels. Column (2) in Table 6 reports the results of the mediation regression between analyst attention and accounting information quality. It is evident that analyst attention and corporate digital transformation are significantly positively correlated at the 1% level, indicating that digital transformation contributes to increasing analyst attention and plays a positive role in a company's internal governance.

Table 6. Mechanism Test Results

Variables	Internal Control	Analyst Attention
	(1)	(2)
	<i>DIB</i>	<i>Analyst</i>
<i>Dig</i>	0.1681*** (-4.4708)	0.0088*** (-12.7047)
<i>_Cons</i>	450.4647*** (-47.2866)	-9.8536*** (-64.8429)
<i>Ind</i>	Yes	Yes
<i>Year</i>	Yes	Yes
<i>N</i>	21,566	21,566
<i>R²</i>	0.273	0.418

6. Heterogeneity Analysis

6.1 Management Ownership Ratio

During the process of digital transformation, the management team must shoulder more responsibilities and pressures, which can subsequently influence accounting information quality. Equity incentives can enhance earnings quality through the "alignment of interests" effect between management and shareholders (Fu Qiang et al., 2019)[41]. However, excessively high levels of management ownership can weaken external monitoring forces and increase the management's autonomy and decision-making authority in corporate operations.

This study divides management ownership ratios into two groups based on industry medians: high management ownership ratio and low management ownership ratio. The regression results are reported in columns (1) and (2) of Table 7. The findings suggest that when the management ownership ratio is high, the impact of corporate digital transformation on accounting information quality is significant at the 10% level. Conversely, when the management ownership ratio is low, the impact of digital transformation on accounting information quality is significant at the 1% level. This discrepancy might be due to companies with higher management ownership ratios already having prioritized corporate governance and improvements in accounting information quality in the past. The impact of digital transformation on accounting information quality might be more stable and significant in such companies.

6.2 Research and Development Expenditure

Enterprise research and development (R&D) innovation investments are long-term commitments that may not yield immediate economic benefits. In the eyes of management, R&D investments might not always be a "rational choice" (Huang Dayu et al., 2022)[42]. To ensure short-term financial stability, corporate executives often reduce high-risk R&D investments (Che Dexin et al., 2022)[43]. It also mitigates the risk associated with a company's own R&D investments. Therefore, when sufficient funding is available, companies are more likely to increase R&D investments, subsequently driving digital transformation (Tang Song et al., 2022)[44].

The sample companies are divided into high R&D investment enterprises and low R&D investment enterprises based on industry medians. Regression results are shown in columns (3) and (4) of Table 7. In the case of high R&D investment companies, the regression coefficient of corporate

digital transformation on accounting information quality is -0.0001, which is not significant. For low R&D investment companies, the regression coefficient of corporate digital transformation on accounting information quality is -0.0003, significantly negatively correlated at the 1% level. This indicates that, in low R&D investment companies undergoing digital transformation, more resources might be allocated to improving accounting information quality.

6.3 Competitive Intensity

With the rapid development of the digital economy, businesses are confronted with intense market competition, which can lead to a range of challenges and pressures, including financial and liquidity risks, thereby exerting significant pressure on earnings (Hou and Robinson, 2006)[45]. Even with ample resources and a strong corporate culture, in highly competitive industries, the outcomes of digital transformation might still fall short. The impact of industry competition intensity on digital transformation is crucial, especially in relation to factors linked to executive risk preferences (Zhu Yongming et al., 2023)[46].

In this study, the sample is divided into industry median groups based on the Herfindahl-Hirschman Index (*HHI*). The regression results are reported in columns (5) and (6) of Table 7. The regression outcomes indicate that when industry competition intensity is high, the impact of corporate digital transformation on accounting information quality is not significant. However, when industry competition intensity is low, the impact of corporate digital transformation on accounting information quality is significant at the 1% level. A competitive environment implies that companies may prioritize short-term competitive advantages and market share gains, potentially overlooking the significance of accounting information quality.

Table 7. Heterogeneity Analysis Results

Variables	Management Ownership Ratio		R&D Expenditure		Competitive Intensity	
	(1)	(2)	(3)	(4)	(5)	(6)
	High	Low	High	Low	High	Low
<i>Dig</i>	-0.0001*	-0.0003***	-0.0001	-0.0003***	-0.0001	-0.0003***
	(-1.7059)	(-4.4849)	(-1.5500)	(-4.2244)	(-0.9118)	(-4.5414)
<i>_Cons</i>	0.1085***	0.1566***	0.1275***	0.1221***	0.1183***	0.1532***
	(-6.1513)	(-11.9423)	(-7.625)	(-7.5814)	(-7.2948)	(-11.2262)
<i>Ind</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	10,769	10,797	9,558	9,537	10,041	10,276
<i>R</i> ²	0.077	0.056	0.07	0.067	0.083	0.056

7. Summary

This study examines the impact and pathways of corporate digital transformation on accounting information quality. The main findings are as follows: Firstly, corporate digital transformation significantly enhances accounting information quality, a conclusion that remains robust after undergoing various endogeneity and robustness tests. Secondly, corporate digital transformation improves accounting information quality by reinforcing internal control quality and attracting analyst attention. Thirdly, heterogeneity tests indicate that the promoting effect of digital transformation is more pronounced in companies with low management ownership, low R&D investment, and low market competition intensity.

Considering the research conclusions and the actual development of digital transformation in Chinese companies, this study offers several implications with relevance for policy-making authorities, listed companies, and investors. Firstly, the impact of digital transformation varies significantly among firms with different attributes. When formulating policies, governments should consider the heterogeneity of enterprises. Secondly, companies should focus on building a robust internal control system during the digital transformation process and prioritize analyst attention to

provide accurate and transparent financial information, enhance market attention and recognition. Lastly, investors should pay attention to a company's digital transformation process, evaluate whether a company is proactively undergoing digital transformation, and understand its digital transformation strategies and implementations. The positive impact of digital transformation on accounting information quality implies that companies may possess more accurate and reliable financial information, which holds significant implications for investor decisions and evaluations.

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