

# The Impact of Digital Transformation on Analyst Forecast Accuracy

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**Abstract.** This paper studies the impact of the degree of digital transformation on the accuracy of analysts' forecasts, based on A-shared listed companies from 2007 to 2020. The results show that the degree of digital transformation has a positive impact on the accuracy of analysts' forecasts, and the quality of accounting information plays a positive moderating role between the degree of digital transformation and the accuracy of analysts' forecasts. In a further group test, it was found that for state-owned enterprises, digital transformation can significantly improve the accuracy of analysis and prediction; in addition, in a bull market, digital transformation has a significant impact on the accuracy of analysis and prediction, but in a bull market, the impact is not significant; The quality of accounting information plays a significant moderating role in the above effects. This paper can help enterprises to take advantage of digital transformation and improve the accuracy of analysts' forecasts, providing some inspiration for the government to formulate relevant policies to improve the quality of accounting information of enterprises.

**Keywords:** Digital Transformation, analysts, A-shared.

## 1. Introduction

With the continuous emergence of technologies such as big data, cloud computing, artificial intelligence, etc., the development of enterprises has undergone tremendous changes. The data processing capability has leaped from KB level to PB level. Human society is entering a new digital-centric feature. era. The Fourth Plenary of the 19th Central Committee of the Communist Party of China will position data as the seventh production factor after capital, labor, knowledge, land, technology and management, which marks the acceleration of China's economic development towards digitalization, intelligence and networking. The 14th Five-Year Plan issued by the government clearly deploys tasks such as optimizing digital infrastructure, giving full play to the role of data elements, and promoting digital industrialization. Especially after the new crown epidemic, the impact of the digital economy on business operations and capital markets has become prominent. Government departments at all levels in China are actively turning the "epidemic" into an opportunity and vigorously promoting the process of economic and social digitalization. In this time-oriented change and policy-driven scenario, digital transformation has become an inevitable trend of current enterprise development. The digital transformation of enterprises can improve the dynamic capabilities of enterprises, increase the attention of analysts, and alleviate information asymmetry. Analysts use their professional knowledge to forecast listed companies' information based on various information about companies in the market, and have an important impact on investors' decision-making. High-quality forecasts also improve the efficiency of corporate information transmission to stock prices. Therefore, the accuracy of analysts' forecasts has always been the focus of the capital market and academia.

Regrettably, there are few studies linking digitization and analysts' earnings forecasts. In view of this, this paper takes Shenzhen A-share listed companies as samples to study the impact of digital transformation on the accuracy of analysts' forecasts. This paper makes contributions in the following aspects: Starting from digital transformation, this paper enriches the research on the influencing factors of analyst forecasts and broadens the research scope of analyst forecasts. This paper introduces analyst earnings forecasts into digital theoretical research, from the perspective of analyst forecasts. It supplements the economic consequences of digital transformation, and at the same time studies the impact mechanism of the latter on the former from the perspective of accounting information quality,

enriching the research content of digitalization. From a practical point of view, companies need to focus on showing the reliability of information to analysts, so that digital transformation can fully help analysts make predictions, better transmit high-quality signals to the market, and reduce financing risks. For analysts, whether the more information brought by digital transformation of enterprises is valuable is affected by the quality of their own accounting information, and analysts need to take this into account when making predictions. Governments should strengthen the regulation on enterprises' accounting behaviors, promoting digital transformation to improve analyst forecast accuracy and promotes market efficiency.

## 2. Literature Review

Digital transformation is a process in which an enterprise uses digital technology to drive the transformation of its services, core products and processes, which significantly enhances the core competitiveness of the enterprise and promotes the high-quality development of the enterprise . Digital transformation has an important impact on the development of enterprises and the development of the national economy, industry and enterprises, and is one of the current research hotspots. Current research on the impact of digital transformation can be divided into three levels: macro, meso and micro.

From a macro perspective, digital transformation has an impact on employment and economic development. Zhao Yuxun and Du Zizhe found that the development of the digital economy can optimize the employment structure and improve the quality of employment. In addition, digital transformation has contributed to accelerating the process of urbanization and promoting the coordinated development of regional economies . From a meso-level perspective, digital transformation has an impact on the industry. Digital industrialization has improved the level of industrial digitalization , improved the overall production efficiency and product quality of the industry , and thus promoted the upgrading of the industrial structure. From a micro perspective, digitalization has an impact on the development of enterprises. Digital transformation improves information transparency and reduces managers' irrational decision-making, thereby improving corporate governance. In addition, digital transformation enhances corporate internal control and innovation capabilities, and improves corporate performance. These micro-enterprise-level improvements will have an impact on the stock market.

As participants in the stock market, analysts use their professional knowledge to forecast listed companies based on the collected information, which is of great significance to helping investors make decisions and protecting investors' interests. Therefore, the accuracy of analysts' forecasts deserves attention. There are many factors that affect the accuracy of analysts' forecasts, which can be summarized in the following aspects: (1) At the company level, including the quality of accounting information and corporate strategy. The research of Gu Wenlin et al. found that the more transparent the information disclosure of listed companies, the more securities analysts made predictions, the higher the accuracy of prediction, and the smaller the degree of disagreement. Yan Zhijuan and Wang Shan proved that an increase in the degree of strategic differentiation reduces the accuracy of analysts' earnings forecasts. (2) The characteristics of the analysts. The analyst's experience , gender differences and other characteristics will affect the analyst's forecast bias. (3) Macro environment. Research by Liu Zhinan et al. (2021) found that environmental uncertainty negatively affects analysts' forecast accuracy; in addition, market conditions will affect the forecast value of analysts' stock ratings. In general, data transformation is gradually becoming an important breakthrough point of innovation. Domestic and foreign researches on the impact of digitalization and the factors affecting the quality of analysts' earnings forecasts have achieved certain results. However, few studies have examined the relationship between digital transformation and the accuracy of analysts' forecasts. This also provides an opportunity for this study to explore the impact of enterprise digital transformation on analyst forecasts.

### 3. Theoretical Analysis and Hypothesis

The reasons for the impact of the degree of digital transformation on the accuracy of analysts' forecasts can be viewed from two perspectives: information disclosure by companies and information collection and transformation by analysts. From the perspective of enterprises, the application of digital technology has improved the propensity and ability of enterprises to disclose information. In the past, enterprises accumulated a large amount of information in the production process. Before the popularization of digital technology, most enterprises processed information through inefficient methods such as written records, and the information hidden in the data could not be effectively used. Now, digital transformation enables enterprises to use data technology to dig out more potential information, so as to show the situation of the enterprise more comprehensively, and provide high-quality information for analysts to predict more in time. From the analyst's point of view, the analyst's ability to collect and analyze information is improved. Digital transformation allows analysts to get more information from the enterprise, so as to understand the enterprise more fully, and the analytical ability has also been improved. In addition, the increase in the amount of information released by enterprises can reduce the difficulty and cost of obtaining information for analysts. Therefore, assume the following:

Hypothesis 1: The degree of digital transformation has a positive impact on analyst forecast accuracy.

Analysts make predictions based on the information obtained. The quality of accounting information plays an important role in analysts' forecasts. The improvement of accounting information quality is also conducive to strengthening analysts' trust in obtaining information, relying more on objective information and reducing subjective judgments, thereby reducing the probability of subjective bias. The quality of accounting information requires accounting information to be reliable, relevant, understandable, comparable, substance over form, importance, prudence and timeliness. If listed companies can disclose information in a timely and adequate manner, and the transparency of information increases, the more reliable information analysts can use. The research of Wei Yanlin et al. proved that the higher the frequency of information disclosure of data assets, the higher the accuracy of analysts' forecasts. When the quality of corporate accounting information is high, the information delivered by digital transformation is more available to analysts and can be better used for earnings forecasting. However, when the quality of corporate accounting information is low, it is more likely that report whitewashing and financial fraud will occur within the company. Although the digital transformation of a company can imply more company information, such information may not be reliable, and may even interfere analysts' predictions, which negatively affects the relationship between the degree of digital transformation and the accuracy of analysts' forecasts. Based on that, the paper puts forward the following hypothesis:

Hypothesis 2: The quality of accounting information plays a positive moderating role between the degree of digital transformation and the accuracy of analysts' forecasts.

## 4. Research Design

### 4.1 Sample Acquisition

This paper selects Shanghai and Shenzhen A-share listed companies as research samples to test the impact of the degree of digital transformation on the accuracy of analysts' forecasts, and obtains indicators of the degree of digital transformation of listed companies, analysts' forecasted earnings per share, and company basic indicators through the CSMAR database. For the initial sample, filter according to the following criteria: remove the financial industry, ST, \* ST and PT listed company samples; remove the companies with missing relevant data; remove the samples with missing values in any variables, and finally obtain 25,571 company observations. In this paper, all continuous variables are winsorized by 1% above and below.

## 4.2 Variable Definition

### 4.2.1 Dependent Variables

Analyst forecast accuracy (Accuracy). Referring to the method of Song Li and Zhang Mingyao , the absolute value of the ratio of the difference between the actual earnings per share and the average analyst forecast and the actual earnings per share reflects the forecast error (F error). The larger the forecast error, the lower the forecast accuracy. Therefore, Analyst forecast accuracy, whichever is the opposite, is represented by the symbol Accuracy. The same analyst may issue multiple forecasts for the same company in the same year, and only the last forecast of each analyst for that year is kept. The larger the value of Accuracy, the higher the accuracy of the analyst's forecast. The calculation formulas are shown in formulas (1) and (2):

$$Error = \left| \frac{Mean(FEPS) - EPS}{EPS} \right| \quad (1)$$

$$Accuracy = Error \quad (2)$$

Where E PS represents actual earnings per share, and Mean (FEPS) represents the average earnings per share forecast.

### 4.2.2 Independent Variables

The degree of digital transformation (Digitalization). This paper selects the index of the digital transformation degree of listed companies in the CSMAR database as the measurement standard of the digital transformation degree of enterprises. Specifically, the sum of the frequency of occurrence of subdivision indicators of computing artificial intelligence technology, computing big data technology, computing digital technology application, computing blockchain technology, computing cloud computing technology in computing enterprise reports is the measure of the degree of digital transformation index.

### 4.2.3 Moderating Variables

Accounting Information Quality (Iq). According to the research of Dichiev , accrual earnings management is an important dimension of accounting information quality, and accrual earnings management is chosen to measure accounting information quality. This paper selects the Jones model modified by the cross section in the CSMAR database to obtain the operational accrual profit (DA), and takes its inverse to represent the quality of accounting information. The larger the absolute value of DA, the higher the possibility of earnings management and the lower the quality of accounting information.

### 4.2.4 Control Variables

**Table 1.** Variable Definitions

Variable Name	Variable Symbol	Definition and Calculation Method
Analyst Earnings Forecast Accuracy	Accurac y	The inverse of Ln (the difference between the actual earnings per share and the average analyst forecast and the absolute value of the ratio of the actual earnings per share)
Digital Transformation	Digitaliz ation	Ln (word frequency count of keywords related to digital transformation in the annual report text of listed companies + 1)
Quality of Accounting Information	Iq	The inverse of Ln (absolute value of discretionary accruals derived from the cross-section modified Jones model)
Company Size	Size	Natural logarithm of total assets
Assets and Liabilities	Lev	Total Liabilities/Total Assets
Big Four Audit	Big4	Dummy variable, if the auditor is from the Big Four accounting firm, take 1, otherwise take 0.
Operating Income Growth Rate	Growth	Operating income for the current year/operating income for the previous year-1
ROE	ROE	Net profit/net assets
Shareholding Ratio of the Largest Shareholder	Top1	Number of shares held by the largest shareholder/total number of shares
Listing Period	ListAge	L n (year of current year - year of listing + 1)
Earnings Predictability	Ke	Operating Profit/Net Profit

In addition to the quality of information disclosure, there are a number of factors that can affect the accuracy of analysts' forecasts. This paper refers to previous literatures [17, 18], and selects the following control variables: company size (Size), asset-liability ratio (Lev), the four major audits (Big4), operating income growth rate (Growth), net assets Return rate (ROE), shareholding ratio of the largest shareholder (Top1), listing period (ListAge), earnings predictability (Ke).

The definition and calculation method of each variable are shown in Table 1.

### 4.3 Model Construction

For hypothesis 1, the model 1 designed in this paper is as follows:

$$Accuracy_{it} = \alpha_0 + \alpha_1 Digitalization_{it} + \alpha_i \sum Control_{it} + \varepsilon_{it} \quad (1)$$

In the formula, the explanatory variable is the degree of digital transformation of the enterprise (Digitalization), and the explained variable is the analyst forecast accuracy (Accuracy).

For hypothesis 2, the model 2 designed in this paper is as follows:

$$Accuracy_{it} = \alpha_0 + \alpha_1 Digitalization_{it} + \alpha_2 Iq_{it} + \alpha_3 Iq_{it} \cdot Digitalization_{it} + \alpha_i \sum Control_{it} + \varepsilon_{it} \quad (2)$$

In the formula, the explanatory variable is the degree of digital transformation of the enterprise, the explained variable is the analyst's forecast accuracy, and the moderating variable is the accounting information quality (Iq).

## 5. Analysis of Empirical Results

### 5.1 Descriptive Statistical Analysis

The descriptive statistics of each variable are shown in Table 2, with a total of 25571 samples. The accuracy of analysts' earnings forecasts has a minimum value of -5.233, a maximum value of -0.23, and a standard deviation of 1.092. The degree of digital transformation has a minimum value of 0, a maximum value of 4.965, and a standard deviation of 1.357. The minimum value of accounting information quality is -7.013, the maximum value is -0.885, and the standard deviation is 1.169. Through the descriptive statistical analysis of the explanatory variables and the explained variables, it can be seen that there are certain differences between the samples. Observing the control variables, the average asset-liability ratio is 43.5%. It can be seen that the overall debt ratio of the enterprise is relatively high, and the financial risk is relatively large. The maximum shareholding ratio of the largest shareholder is 75%, and the average value is 0.354, indicating that the enterprise has a high shareholding concentration. The average value of earnings predictability is 0.835, indicating that the company's earnings are generally more likely to be accurately forecasted.

**Table 2.** Descriptive Statistics Results

Variable	Number of Samples	Average Value	Standard Deviation	Minimum	Maximum Value
Accuracy	25571	-1.371	1.092	-5.233	-0.023
Digitalization	25571	1.160	1.357	0.000	4.956
Iq	25571	-3.184	1.169	-7.013	-0.885
Size	25571	22.276	1.294	20.000	26.271
Big4	25571	0.067	0.250	0	1
Growth	25571	0.183	0.395	-0.509	2.486
Lev	25571	0.435	0.201	0.056	0.869
ROE	25571	0.077	0.110	-0.472	0.360
Top1	25571	0.354	0.150	0.090	0.750
ListAge	25571	2.129	0.746	0.693	3.434
Ke	25571	0.835	0.157	0.215	1.483

## 5.2 Correlation Analysis

The accuracy of analysts' earnings forecasts is positively correlated with the degree of digital transformation and the quality of accounting information at a significant level of 1%, and the absolute value of the correlation coefficient between the variables is less than 0.6, indicating that there is no serious multicollinearity between the variables.

**Table 3.** Correlation Analysis Results

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Accuracy	1.000										
(2) Digitalization	0.033***	1.000									
(3) Iq	0.034***	-0.039***	1.000								
(4) Size	-0.090***	0.047***	-0.070***	1.000							
(5) Lev	-0.025***	-0.102***	0.042***	0.519***	1.000						
(6) Big4	-0.072***	-0.027***	-0.036***	0.364***	0.115***	1.000					
(7) Growth	-0.058***	0.020***	0.094***	0.028***	0.051***	-0.016***	1.000				
(8) ROE	-0.194***	-0.018***	-0.027***	0.098***	-0.119***	0.065***	0.274***	1.000			
(9) Top1	-0.068***	-0.135***	-0.007	0.206***	0.087***	0.147***	0.013**	0.124***	1.000		
(10) ListAge	-0.059***	-0.020***	-0.032***	0.440***	0.365***	0.076***	-0.070***	-0.074***	-0.044***	1.000	
(11) Kc	0.094***	0.089***	0.022***	-0.124***	-0.120***	-0.034***	-0.035***	-0.152***	-0.070***	-0.113***	1.000

Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## 5.3 Multiple Linear Regression Analysis

**Table 4.** Regression Analysis Results

Variable	(1)	(2)	(3)	(4)	(5)
	Accuracy	Accuracy	Accuracy	Accuracy	Accuracy
Digitalization	0.0130*	0.0193**	0.019**	0.054***	
	(0.00780)	(0.00754)	(2.57)	(3.50)	
Iq			0.016**	0.003	
			(2.54)	(0.37)	
Interact				0.011**	
				(2.51)	
c_Digitalization					0.020***
					(2.61)
c_Iq					0.016**
					(2.52)
interact_c					0.011**
					(2.51)
Size		-0.00701	-0.006	-0.006	-0.006
		(0.00962)	(-0.62)	(-0.63)	(-0.63)
Lev		-0.0258	-0.031	-0.031	-0.031
		(0.0512)	(-0.61)	(-0.61)	(-0.61)
Big4		-0.174***	-0.173***	-0.174***	-0.174***
		(0.0386)	(-4.48)	(-4.51)	(-4.51)
Growth		-0.0440**	-0.048***	-0.049***	-0.049***
		(0.0185)	(-2.59)	(-2.63)	(-2.63)
ROE		-1.744***	-1.737***	-1.725***	-1.725***
		(0.0662)	(-26.11)	(-25.68)	(-25.68)
Top1_w		-0.209***	-0.209***	-0.208***	-0.208***
		(0.0571)	(-3.66)	(-3.64)	(-3.64)
ListAge		-0.0816***	-0.081***	-0.081***	-0.081***
		(0.0135)	(-6.01)	(-5.99)	(-5.99)
Is		0.392***	0.389***	0.387***	0.387***
		(0.0535)	(7.26)	(7.24)	(7.24)
Constant	-1.768***	-1.548***	-1.521***	-1.557***	-1.543***
	(0.0756)	(0.209)	(-7.26)	(-7.40)	(-7.35)
year, industry	YES	YES	YES	YES	YES
sample size	25,571	25,571	25,571	25,571	25,571
R <sup>2</sup>	0.021	0.065	0.065	0.066	0.066
A dj_R <sup>2</sup> _	0.0194	0.0637	0.0640	0.0642	0.0642
F	12.89	41.92	42.28	41.85	41.85

Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

In order to test the hypotheses H1 and H2, multiple regression analysis was performed on each variable, and the results are shown in Table 4: (1) The relationship between the degree of digital transformation and the accuracy of analysts' forecasts. Column (1) in Table 4 only controls the effect of industry and year, and the regression coefficient of the degree of digital transformation is 0.013 and passes the 10% statistical significance test. After that, the corresponding control variables are added in column (2), and the regression coefficient of the digital transformation degree of the enterprise is 0.0193. Significant at the 5% statistical level. This shows that the improvement of the digital level of enterprises can significantly improve the accuracy of analysts' forecasts, and there is a positive correlation between the two, which verifies the hypothesis H1 of this paper. (2) Test the moderating effect of accounting information quality between the degree of digital transformation and the accuracy of analysts' earnings forecasts. The accounting information quality is significantly positively correlated with the accuracy of analysts' earnings forecasts at the 5 % level, and the interaction term between the accounting information quality and the degree of digital transformation is significantly positively correlated at the 5% level. Hypothesis 2 is verified.

#### 5.4 Robustness Check

In order to further confirm the robustness of the research in this paper, the following processing is done: First, the sub - samples after 2016 are selected. Analysts can take into account the degree of digital transformation of the enterprise and use corresponding information, which is an important prerequisite for the impact of the degree of digital transformation on the accuracy of analysts' forecasts. After the outline of the 13th Five-Year Plan puts forward the development strategy of building a digital China, analysts are more likely to pay attention to the degree of digital transformation of enterprises, and can better meet the premise that the degree of digital transformation affects the accuracy of analysts' forecasts. Therefore, this paper selects the sub - samples from 2016 to 2020, and uses the original model to re-regress the test. The results are shown in (1) in Table 5. The research conclusions remain unchanged, indicating that this research is highly robust.

Secondly, referring to the research of Qi Huaijin et al. , the digitalization level of the company is measured by the proportion of the part related to digital transformation in the total intangible assets of the intangible assets disclosed in the notes to the financial reports of listed companies at the end of the year. Specifically, when a detailed item of intangible assets includes keywords related to digital transformation technology such as "software", "network", and "client" and related patents, the detailed item is defined as "digital technology intangible assets". Then, add up multiple digital technology intangible assets of the same company in the same year, and calculate the proportion of the intangible assets in the current year, which is the proxy variable of the degree of digital transformation of the enterprise. Using the original model to re-regress the test, the results are shown in (2) in Table 5, and the research conclusions remain unchanged.

In order to alleviate the endogeneity, first-order difference processing is performed on all variables according to the time series, and the original model is used to re-regress the test. The results are shown in (3) in Table 5, and the research conclusions remain unchanged. In order to further solve the endogeneity problem, this paper selects the number of Internet users in the same province as an instrumental variable to test the regression conclusion. The number of people accessing the Internet in a province reflects the use of digital infrastructure and the application level of the digital economy in the province. The external environment of the digital economy in the province has a certain correlation with the digital transformation of enterprises in the province. The number of Internet users will affect the accuracy of analysts' earnings forecasts, so the conditions for exogenous variables are satisfied. Using the original model to re-regress the test, the results are shown in (4) and (5) in Table.

5.5 The regression results are consistent with the research hypothesis.

Table 5. Robustness Test Results

Variable	(1)	(2)	(3)	(4)	(5)
	Accuracy	Accuracy	Accuracy	Digitalization	Accuracy
Digitalization1	0.017* (0.009)				
Digitalization2		0.094** (0.038)			
Digitalization3					0.241* (0.131)
Digitalization4			0.018** (0.007)		
Internet user				4.55e-05*** (9.57e-06)	
Size	-0.025* (0.013)	-0.006 (0.010)	-0.011 (0.008)	0.073*** (0.159)	-0.007 (0.015)
Lev	0.021 (0.072)	-0.034 (0.052)	0.016 (0.048)	-0.277*** (0.090)	0.050 (0.077)
Big4	-0.120** (0.052)	-0.176*** (0.039)	-0.183*** (0.031)	-0.114** (0.575)	-0.185*** (0.050)
Growth	-0.058** (0.026)	-0.048** (0.019)	-0.041** (0.019)	0.137*** (0.223)	-0.059** (0.029)
ROE	-1.933*** (0.086)	-1.750*** (0.067)	-1.645*** (0.078)	0.394*** (0.112)	-1.580*** (0.113)
Top1	-0.252*** (0.081)	-0.217*** (0.058)	-0.223*** (0.051)	-0.189* (0.098)	-0.161** (0.080)
ListAge	-0.038** (0.018)	-0.080*** (0.014)	-0.098*** (0.012)	-0.27 (0.021)	-0.123*** (0.019)
Ke	0.392*** (0.071)	0.384*** (0.054)	0.371*** (0.049)	0.117** (0.058)	0.396*** (0.072)
Constant	-0.641** (0.303)	-1.564*** (0.212)	-1.125*** (0.186)	-1.567*** (0.323)	-1.542*** (0.261)
year, industry	YES	YES	YES	YES	YES
sample size	12,422	25,066	21,739	15,399	15,399
R2	0.071	0.066	0.060	0.3904	0.028
Adj_R2	0.0691	0.0642	0.0586	0.3890	0.0255
F	36.43	40.83		115.13	

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

6. Further Research

6.1 Nature of Equity

Compared with private enterprises, state-owned enterprises have the advantages of state support and state-owned capital. They are larger in scale, have better development momentum, and are more stable. Therefore, the impact of uncertainty in the process of digital transformation is smaller, and it is easier for analysts to predict. Secondly, state-owned enterprises have closer ties with the government and respond more actively to the call of the national digital strategy. Analysts also pay more attention to the development of state-owned enterprises, so they are more active in forecasting them. However, private enterprises do not have the support of a large amount of state capital, are smaller in scale, have higher financing risks, and are subject to greater uncertainty in digital transformation, so analysts' forecasts are more likely to have errors, making it difficult for non-state-owned enterprises to improve the degree of digital transformation.

Based on the above analysis, this paper examines the impact of the degree of digital transformation on analysts' forecast accuracy under different ownership properties, and divides the corresponding samples into state-owned enterprises and non-state-owned enterprises according to whether the state holds or not. The results of the group regression test are shown in Table 6. The coefficient of the explanatory variable is 0.033, which is significant at the 5 % confidence level, whereas the coefficient in column (1) is not significant. The above results show that the degree of digital transformation of non-state-owned enterprises is difficult to exert an influence on analysts' forecasts. The interaction term between digital transformation and accounting information quality is significant in column (6), but not significant in (3), indicating that for state-owned holding enterprises, the improvement of accounting information quality can significantly improve the degree of digital transformation and the forecast accuracy of analysts.

**Table 6.** Group Regressions that Distinguish Non- state- owned and State-owned Enterprises

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	non-state-owned enterprise			state-owned enterprise		
Digitalization	0.013 (0.009)	0.013 (0.009)	0.013 (0.009)	0.033** (0.015)	0.033** (0.015)	0.034** (0.015)
Iq		0.023*** (0.008)	0.022*** (0.008)		0.005 (0.010)	0.014 (0.010)
interact			0.006 (0.005)			0.026*** (0.009)
Size	0.017 (0.014)	0.018 (0.014)	0.018 (0.014)	-0.026* (0.014)	-0.025* (0.014)	-0.025* (0.014)
Lev	-0.162** (0.063)	-0.172*** (0.063)	-0.172*** (0.063)	0.132 (0.085)	0.131 (0.085)	0.131 (0.086)
Big4	-0.162*** (0.058)	-0.161*** (0.058)	-0.161*** (0.058)	-0.150*** (0.050)	-0.150*** (0.050)	-0.152*** (0.050)
Growth	-0.012 (0.023)	-0.019 (0.023)	-0.020 (0.023)	-0.105*** (0.031)	-0.106*** (0.031)	-0.106*** (0.031)
ROE	-1.507*** (0.084)	-1.486*** (0.085)	-1.479*** (0.086)	-2.154*** (0.108)	-2.154*** (0.108)	-2.145*** (0.108)
Top1	-0.155** (0.074)	-0.157** (0.074)	-0.156** (0.074)	-0.202** (0.094)	-0.202** (0.094)	-0.196** (0.094)
Listing	-0.085*** (0.017)	-0.084*** (0.017)	-0.084*** (0.017)	-0.041 (0.026)	-0.041 (0.026)	-0.042 (0.026)
Ke	0.355*** (0.071)	0.349*** (0.071)	0.349*** (0.071)	0.461*** (0.079)	0.460*** (0.079)	0.459*** (0.079)
Constant	-2.009*** (0.303)	-1.957*** (0.304)	-2.014*** (0.304)	-1.289*** (0.292)	-1.280*** (0.292)	-1.252*** (0.294)
year, industry	Y ES	Y ES	Y ES	Y ES	Y ES	Y ES
sample size	15,276	15,276	15,276	10,295	10,295	10,295
R <sup>2</sup>	0.048	0.049	0.049	0.088	0.088	0.089
Adj_R <sup>2</sup>	0.0456	0.0461	0.0461	0.0848	0.0847	0.0855
F	19.21	20.07	19.67	26.69	26.08	25.68

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6.2 Market Status

When the market is in a bull market, most companies are in a state of growth in revenue, and analysts are more motivated to forecast. They pay more attention to the impact of digital transformation of enterprises on enterprises, and can promote the impact of digital transformation of enterprises on the accuracy of analysts' forecasts. However, in a bear market, companies face greater uncertainty in their digital transformation, and when disclosing digital transformation information, they are more likely to use obscure words to increase the difficulty of reading, so it is more difficult for analysts to predict. In addition, when the market is in a downturn, analysts' profit margins become smaller, their enthusiasm for forecasting decreases, and their response to information about the digital transformation of enterprises decreases, so forecast errors are more likely to occur. At this time, it is

difficult for companies to increase the degree of digital transformation to improve the accuracy of analysts' forecasts.

**Table 7.** Grouped Regressions that Differentiate Between Bear and Bull Markets

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	bear market			bull market		
Digitalization	0.008 (0.010)	0.008 (0.010)	0.008 (0.010)	0.031*** (0.009)	0.031*** (0.009)	0.031*** (0.009)
Iq		0.014* (0.008)	0.017** (0.008)		0.017* (0.009)	0.013 (0.010)
interact			0.011* (0.006)			0.012* (0.006)
Size	0.001 (0.011)	0.002 (0.011)	0.002 (0.011)	-0.023* (0.013)	-0.022 (0.013)	-0.022 (0.013)
Lev	0.008 (0.063)	0.003 (0.063)	0.003 (0.063)	-0.028 (0.072)	-0.034 (0.073)	-0.033 (0.073)
Big4	0.203*** (0.045)	-0.202*** (0.045)	-0.203*** (0.045)	-0.136** (0.054)	-0.135** (0.054)	-0.136** (0.054)
Growth	-0.038 (0.026)	-0.041 (0.026)	-0.041 (0.026)	-0.050* (0.026)	-0.056** (0.027)	-0.057** (0.027)
ROE	1.614*** (0.085)	-1.611*** (0.085)	-1.602*** (0.085)	-1.884*** (0.089)	-1.870*** (0.090)	-1.857*** (0.090)
Top1	0.260*** (0.070)	-0.261*** (0.070)	-0.260*** (0.070)	-0.150* (0.080)	-0.149* (0.080)	-0.148* (0.080)
ListAge	0.121*** (0.016)	-0.120*** (0.016)	-0.120*** (0.016)	-0.028 (0.019)	-0.027 (0.019)	-0.027 (0.019)
Ke	0.478*** (0.072)	0.475*** (0.072)	0.474*** (0.072)	0.299*** (0.075)	0.295*** (0.075)	0.293*** (0.075)
Constant	1.708*** (0.246)	-1.684*** (0.247)	-1.716*** (0.247)	-0.860*** (0.291)	-0.824*** (0.291)	-0.841*** (0.293)
year, industry	Y ES	Y ES	Y ES	Y ES	Y ES	Y ES
sample size	14,213	14,213	14,213	11,358	11,358	11,358
R <sup>2</sup>	0.071	0.071	0.072	0.062	0.062	0.063
Adj_R <sup>2</sup>	0.0689	0.0691	0.0693	0.0596	0.0598	0.0601
F	31.39	30.99	30.59	31.10	31.17	30.54

Robust standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Based on the above analysis, this paper examines the impact of the degree of digital transformation of enterprises on the accuracy of analysts' forecasts under different market conditions. Referring to the previous literature CSI 300 index is selected as the stock market index, and its 120 - day moving average is used to label 2007-2013, 2016, and 2018 as bear market stages, while 2014-2015, 2017, 2019, and 2020 are divided into bull market category. The corresponding samples are divided into bull and bear market state groups according to the earnings measurement year. The results of the group regression test are shown in Table 7. As shown in the column (4) of Table 6, the coefficient of the explanatory variable is 0.031, which is significant at the 1 % confidence level, while the coefficient in the column (1) is not significant. The above results show that the degree of digital transformation in a bear market is difficult to influence analysts' forecasts. The interaction term between digital transformation and accounting information quality is significant in column (6), but not significant in (3), indicating that in a bull market state, the improvement of accounting information quality can significantly enhance the degree of digital transformation on analysts' forecast accuracy impact.

## 7. Conclusion

This paper takes the A-share listed companies in Shanghai and Shenzhen from 2007 to 2020 as a research sample, examines the impact of the degree of digital transformation of enterprises on the accuracy of analysis and forecast, and explores the role of accounting information quality in the

above-mentioned impact of digital transformation. The study found that the degree of digital transformation of enterprises significantly improved the accuracy of analysis and prediction, and the quality of accounting information significantly promoted the impact of digital transformation. Further research found that the digital transformation of state-owned holding enterprises can improve the accuracy of analysis and prediction, but this effect is not shown in the state-owned enterprises. In addition, the digital transformation of enterprises in a bear market state cannot significantly improve the accuracy of analysts' forecasts, and the quality of accounting information also cannot play a significant role in moderating.

Based on the above conclusions, the suggestions made in this paper are as follows: (1) Enterprises should actively conform to the development trend of digitalization, use digital technology to enhance the innovation ability and development potential of enterprises, give full play to the advantages of digital transformation, and enhance the stability and sustainability of enterprise development. At the same time, companies are suggested to use digital technology to disclose corporate information in a timely, comprehensive and objective manner, and provide high-quality information to investors and analysts. (2) Analysts should pay attention to the impact of digital transformation on analyst forecasts, especially when the market is in a downturn and for non-state-owned enterprises, they should pay more attention to the screening and judgment of information, and actively use their professional knowledge to reduce forecast errors. (3) The government should urge enterprises to improve the quality of accounting information, and at the same time provide appropriate subsidies to enterprises to slow down the instability brought by digital transformation to enterprises.

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