The Impact of Corporate Digital Transformation on Market Value: An Analysis Based on the Tobin's Q Ratio of A-Share Listed Companies

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ABSTRACT

In this study, A-share companies listed on China stock exchange from 2011 to 2024 are taken as samples, and principal-agent theory and theory of information asymmetry are used. Then, we will make an empirical investigation on how digital conversion affects enterprise value and how this influence works. From the survey results, it is found that digital transformation can greatly improve the enterprise value. Heterogeneity analysis shows that there is no obvious difference between manufacturing and non-manufacturing industries in the good influence of digital transfer on improving enterprise value. Through mechanism verification, we find that digital conversion can improve enterprise value by reducing agency cost, easing information system and strengthening management supervision. This study will provide empirical evidence for digital initiatives and policy making of enterprises.

Keywords: Digital Transformation; Firm Value; Agency Costs; Information Asymmetry

1. INTRODUCTION

1.1 The Background and Significance of Research

Since the onset of the Fourth Industrial Revolution, digital technologies have had a great impact on human society. After China government formally put forward the framework of "new-quality productive forces", it actively recommended the digital transformation of listed companies. These changes, as well as the related capital expenditure, have opened up a new road for the company's growth. Doing well the management work in an orderly way, speeding up the work results and constantly updating the business service mode can not only improve the work results, but also improve the ability of innovative technology. This study attempts to investigate whether it is easy for listed companies that strengthen digital technology investment to gain higher market value proposition, and find out the mechanism that increasing digital investment affects the company's market value.

1.2 Literature Review

With the continuous development of technology, digital tools such as artificial intelligence and big data have developed rapidly and greatly. These new technologies have been widely used, resulting in various new business ways and forms, which fundamentally changed the company's working methods and competition methods. Regarding how to investigate the company's digital conversion, He and Liu (2019) gave a variable of 0 or 1 to indicate whether the company has made this change, and gave a method to measure the impact of this measure [1]. On the other hand, Zhang et al. (2021) investigated the details of intangible assets written in the annual report of listed companies, and formulated a measurement method to calculate the proportion of intangible assets related to digital transformation in the whole intangible assets [2]. According to the method of Wu and colleagues (2021), we made a keyword list that collected 76 words related to digital transformation, counted the times of these words appearing in the annual report, and carried out digital conversion. At present, text mining methods are more widely adopted. [3] Tang et al. (2025) used TextRank algorithm, BERT vectorization and manual filtering together to evaluate the digital conversion level of enterprises. [4] In this paper, the indicator of digital transmission is the intangible assets created by enterprises during digital transmission. This includes annual report keywords in five fields in particular. Its fields are digital technology applications, cloud computing, artificial intelligence, big data and blockchain technologies. By studying the research so far with the concept of "digital transformation-remolding enterprise capability-increasing enterprise value", we can find that the cost of digital technology can reduce the information deviation in enterprises and the expenses related to agency (Wang, 2021) [5]. These investments are also helpful to organize and summarize the supply chain of enterprises and enhance the power of creating value (Youngwoo, 2021). Zhang and his partners (2023) argued that in manufacturing companies, digital conversion can greatly improve the performance of

enterprises by reducing costs, improving the efficiency of asset use and improving the level of technological innovation. [6] According to Shao (2025), digital conversion makes the role of state-owned enterprises very good. It works in three main ways. First, strengthen working ability; Second, advance the technological progress; Third, do a good job in the human capital configurations. Then, the benefits of digital conversion are different. This is especially obvious in centrally controlled state-owned firms, companies in eastern regions, developing companies and high-tech firms. [7] Liu (2025) uses Tobin's Q to represent the value of the company. Then, count the number of words about digital in the annual report and calculate the degree of digitalization. The results of this study show that digitalization has improved the role of the company as a whole, and increased its growth, profitability and market value. Therefore, this study takes corporate agency costs as an indirect mechanism to understand whether digital transformation can improve market value by reducing the cost. [8]

2. THEORETICAL FRAMEWORK

2.1 Research Background

The 14th Five-Year Plan articulates a strategic vision to "accelerate digital development and construct a Digital China." In response, the Chinese government has introduced supportive policies aimed at fostering high-quality expansion within the digital economy. These policies actively promote the commercialization of digital technologies, drive the digital overhaul of conventional industries, and facilitate the seamless embedding of digital functionalities with the tangible economy. Such a regulatory framework environment further underscores the rationale for and significance of corporate investment in digital initiatives.

On the other hand, in China's listed companies, agent disputes between shareholders and management are still very common. Excessive agency expenses and insufficient governance efficiency have always hindered the improvement of company value. On the other hand, some business behaviors, such as doing transactions that are beneficial to one's own interests, making unnecessary investments, and concealing information, will lead to poor asset allocation and low operating efficiency. On the other hand, due to information asymmetry, shareholders can't supervise the management well, which makes the problem of existing agents more serious. In view of this situation, digital transformation as a new governance mechanism is worth studying. The impact on agency expenses and its impact on enterprise value are important research topics that need to be carefully investigated.

2.2 Analysis of Theoretical Mechanisms

Using the methods of principal-agent theory, information asymmetry and resource allocation, the study said that there are three main ways to reduce the agency cost of the company in digital transformation: information asymmetry leads to the increase of the company's value, Form a causal chain of "digital transformation → lower agency costs → higher corporate value".

According to the principal-agent theory, information system is the fundamental reason for the rising cost of agent detectors and agents. As principals, shareholders know nothing about business choices and managers' behavior. On the other hand, as agents, managers sometimes use more information they have to seek benefits for themselves, which may harm the interests of shareholders. In addition, the selfish behaviors of administrators such as self-dealing, overinvestment, rent-seeking activities are the main reasons for agency costs. To firmly control these actions, it is necessary to establish a strong monitoring system. Agency cost essentially represents the waste of resources, which comes from the governance mechanism that can't run smoothly. If the agency cost is too high, resources will not be allocated effectively, thus reducing the market value of the company.

Nevertheless, digital transformation still uses advanced digital technologies such as big data, artificial intelligence, blockchain, etc. In the company's work and operation, to be specific, using these technologies can track the company's transaction costs, resource allocation methods and investment choices in real time. In addition, digital transformation will standardize the company's management procedures, so that the boundaries between the rights and responsibilities of operators are clearer, thus reducing the possibility of operators using their own roles to obtain personal interests and further reducing the agency costs.

2.3 Research Hypotheses

In summary, this study will propose and test the following two hypotheses:

H1: Digital transformation intensity exerts a notable positive effect on the market value of listed firms.

H2: Digital transformation increases the market value of listed companies by reducing internal agency costs

3. RESEARCH DESIGN

3.1 Variable Definition

(1) Explained variable

Tobin's Q (expressed as tobinq). This indicator connects the tangible assets of enterprises with financial assets, and represents the social wealth generated by enterprises when allocating social resources with figures. It is widely used to evaluate the operational efficiency and essential value of enterprises. Tobin's Q is calculated by dividing the total market value of enterprises by the replacement cost of total assets. In this way, the evaluation deviation between the capital market pricing and the input cost of physical assets can be captured. It is very convenient in investment evaluation including both tangible assets and intangible assets, so it is widely used by institutional investors and enterprise decision makers in asset evaluation. Therefore, in this study, Tobin's Q is chosen as the agent of the stated variable of enterprise value.

(2) Core Explanatory Variable

Digital transformation intensity (ln _ digital). Wu et al. (2021) found 76 keys related to enterprise digital transformation. We calculated the number of times the related words "digital" appeared in the annual report, and turned the intensity of digital transformation into numbers. Because the text mining method is more widely used now, the paper also selects the keyword of the annual report from the fields of digital technology application, cloud computing technology and artificial intelligence technology, big data technology and blockchain technology as the basis of the number of words appearing. Add 1 to this number, then carry out log transformation, and finally make the degree variable of digital transformation. (ln_digital = $\ln(digital + 1)$).

(3) Control Variables

Firm Size (Size): In the existing research, the size of a company is always expressed by its annual total assets. Specifically, the number of total assets is converted into natural logarithm for use. Debt-to-Asset Ratio (LEV): This is the total liabilities at the end of the year divided by the total assets at the end of the year. This leverage indicator indicates the state of the company's financial leverage and the intensity of debt repayment. Even companies with different scales and career types can be widely used. Revenue Growth Rate (Growth): this indicator indicates the growth mode of operating income in one year. The calculation method is Growth=(income the year before this year's income)/income this year. Cash Flow Ratio (Cashflow): This is obtained by dividing the pure cash flow generated in business by the total assets of the company. This value represents the company's ability to use its own assets to earn cash income. As a common financial indicator, it can not only show the smooth way of business and the ability to repay debts, but also be an important standard to judge the overall financial soundness of the company. Company Age (Age): this indicator is the number after the observation year minus the company's founding year. Indicates how long the company has been in the market. In most cases, listed companies with a long history are more likely to get better market evaluation.

3.2 Benchmark Regression Model

To verify the impact of digital transformation on the market value of listed companies, the following model was constructed after completing the tests for model suitability:

$$TobinQ_{i,t} = \alpha + \beta_1 \ln\_digital_{i,t} + \beta_2 Size_{i,t} + \beta_3 LEV_{i,t} + \beta_4 Cashflow_{i,t} + \beta_5 Growth_{i,t} + \beta_6 Age_{i,t} + \mu_i + \lambda_i + \varepsilon_{i,t} \quad (1)$$

Table 1. Variable Definition.

Symbol	Variable Name	Meaning
$TobinQ_{i,t}$	TobinQ	Dependent variable, Tobin's Q ratio (firm value)
$\ln\_digital_{i,t}$	ln_digital	Key explanatory variable: degree of digital transformation (logarithm of word frequency plus 1)
$Size_{i,t}$	Size	Company size (log of total assets)
$LEV_{i,t}$	LEV	Debt-to-Equity Ratio
$Cashflow_{i,t}$	Cashflow	Revenue Growth Rate
$Growth_{i,t}$	Growth	Cash Flow Ratio
$Age_{i,t}$	Age	Company Age
μ_i		Firm-specific effects (controlling for firm characteristics that do not change over time)
λ_i	i.year	Year Fixed Effects (to control for macroeconomic shocks)
$\varepsilon_{i,t}$		Random error term

3.3 Sample Selection and Data Sources

IBM put forward the official definition of digital transformation back in 2012. Nevertheless, abundant corporate practical explorations and related technical applications emerged ahead of this official proposition, hence the sample initiation year is specified as 2011 in this study. Combined with the latest publicly released financial information, the research sample covers A-share listed corporations on both Shanghai and Shenzhen bourses over the timeframe of 2011 to 2024.

Samples of ST, *ST and PT flagged listed entities are excluded, as well as corporate observations missing core indicator information. To mitigate the disturbance caused by extreme outliers, continuous variables are treated with 1%–99% percentile winsorization. After the above screening and data adjustment, the finalized dataset includes 30,310 firm-year records. All empirical raw data is sourced from the GTA-developed CSMAR (China Stock Market & Accounting Research Database).

4. EMPIRICAL ANALYSIS

4.1 Summary Statistics

Table 2. Summary Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Tobin Q	31,834	2.193	1.43	.867	9.638
ln digital	31,834	2.212	1.184	.693	5.268
Size	31,834	22.27	1.316	18.925	26.265
LEV	31,834	.409	.204	.051	.939
Growth	30130	.134	.369	-.589	2.255
cashflow	31,834	.048	.067	-0.161	.252
Age	31834	20.052	6.566	2	70

Table 2 presents the descriptive statistics for the main variables. As shown in the table, the mean of Tobin's Q (TobinQ) is 2.193, with a standard deviation of 1.43, a minimum value of 0.867, and a maximum value of 9.638, indicating significant

differences in market value among the sample firms. The average value of digital transformation (ln_digital) stands at 2.212, with a standard deviation of 1.184 and a span of 0.693 to 5.268, which reflects substantial disparities in digital maturity across firms.

Regarding the control variables, the mean for firm size (Size) is 22.27, the mean for debt-to-equity ratio (LEV) is 0.409, the mean for revenue growth rate (Growth) is 0.134, the mean for cash flow ratio (cashflow) is 0.048, and the mean for firm age (Age) is 20.052 years. The standard deviations for all variables are within reasonable ranges, with no extreme outliers observed.

4.2 Correlation Test Results

Table 3 shows the Pearson correlation coefficient matrix for the main variables. As written in the table, the correlation coefficient between digital transformation (ln _ digital) and Tobin's Q (TobinQ) is 0.101, and they are significantly positively correlated at the level of 1%. This further supports the research hypothesis that "digital conversion can increase the value of the company". As for the control variables, firm size (Size), leverage ratio (LEV) and firm age (Age) are all negatively correlated with Tobin's Q, and the correlation coefficients are -0.320, --0.320 Revenue growth rate(Growth) and cash flow ratio(Cashflow) are positively correlated with Tobin's Q, respectively. In addition, the absolute values of all correlation coefficients between control variables are less than 0.5, which shows that there is no serious multicollinearity problem between variables, and subsequent regression analysis can be carried out.

Table 3. Pairwise correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) TobinQ	1.000						
(2) ln_digital	0.101*	1.000					
	(0.000)						
(3) Size	-0.320*	-0.028*	1.000				
	(0.000)	(0.000)					
(4) LEV	-0.199*	-0.063*	0.472*	1.000			
	(0.000)	(0.000)	(0.000)				
(5) Growth	0.107*	-0.008	0.032*	0.021*	1.000		
	(0.000)	(0.163)	(0.000)	(0.000)			
(6) cash flow	0.080*	-0.060*	0.104*	-0.138*	0.043*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(7) Age	-0.086*	-0.031*	0.228*	0.198*	-0.100*	0.013	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.025)	

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

4.3 Results of the Baseline Regression

Table 4 summarizes what was found in baseline regression. The estimation coefficient of digital transmission is 0.0528, which is statistically significant at the level of 1%. This shows that digital transformation has a good effect on the market value of listed companies, and the main hypothesis that supports this research is correct. Regarding the size of the company, the estimated coefficient is -0.607, $p < 0.01$, which is significant. This shows that the bigger the company, the lower the value of Tobin's Q. The possible explanation is that when the company grows up, the agency costs in the organization will rise. The coefficient of debt-to-equity ratio is 0.400, which is also significant at the level of 0.01. On the one hand, it shows that moderate leverage has a good effect on improving the company's value, on the other hand, companies with more debts have higher risk premiums. The coefficient of income growth rate is 0.214, which is also meaningful at the level of 1%.

This shows that enterprises with expanded business and strong growth momentum are more vulnerable to higher market evaluation. Similarly, the coefficient of cash flow level is 1.339, and $p < 0.01$ is meaningful. The more cash flow of an enterprise, the more obvious the rise of its market value. Finally, the estimation coefficient of the enterprise's entrepreneurial years is 0.0726, which is meaningful at the level of 1%. This may be because long-term enterprises are considered more mature and stable, so they will get higher market evaluation.

Regarding the fixed effect of years, the coefficients of most dummy variables in 2011-2024 are significant. This shows that the annual benefit has been well adjusted, and the time-related fluctuations such as macroeconomics and industry cycle have been fully eliminated. The Rho coefficient of the fixed effect is 0.631, which indicates that the personal effect explains about 63% of population variance, so it is appropriate to use the fixed effect model. The F-value of the whole model is 137.16, the p-value is less than 0.000, and the R-squared is 0.217. This shows that the whole regression model is statistically significant and matches the variables very well.

Table 4. Results of the Baseline Regression.

VARIABLES	**(1)** **TobinQ**
ln_digital	0.0528***
	(0.0144)
Size	-0.607***
	(0.0413)
LEV	0.400***
	(0.115)
Growth	0.214***
	(0.0217)
cash flow	1.339***
	(0.144)
Age	0.0726***
	(0.00549)
2012.year	-0.160***
	(0.0355)
2013.year	0.231***
	(0.0418)
2014.year	0.595***
	(0.0452)
2015	1.749***
	(0.0583)
2016	0.927***
	(0.0430)

Table 4. (continued) Results of the Baseline Regression.

VARIABLES	(1) TobinQ
2017	0.427***
	(0.0349)
2018	-0.153***
	(0.0280)
2019.year	0.114***
	(0.0266)
2020.year	0.304***
	(0.0277)
2021.year	0.375***
	(0.0243)
2022	0.00360
	(0.0183)
2023.year	0.0372***
	(0.0120)
2024	-
Constant	13.67***
	(0.828)
Observations	30,130
Number of Stkcd	4,837
R-squared	0.217

Robust standard errors in parentheses

*** p < 0.01, ** p < 0.05, * p < 0.1

4.4 Endogeneity Tests

The fixed effect model can reduce the deviation of omitted variables to a certain extent, but the endogenous relationship between digitalization and corporate value may remain. This means that companies with large market capitalization are more likely to prepare investment funds for new technologies, including AI and cloud-based systems. In order to solve this problem, this study uses the manipulated variable method to verify the endogenous possibility. According to the practice of previous research, we use the value of digital transformation before the first phase (L.ln_digital) as the manipulated variable for the current level of digital transformation. The digitization level before Phase 1 is closely related to the current level, so this selection method meets the criteria of relevance. In addition, digitalization in the past will not directly affect the present enterprise value, so it also meets the external conditions. According to the endogenous verification results, the P value of DWH test is 0.169, which cannot abandon the original hypothesis that ln_digital is exogenous. It can be seen from this result that there is no serious endogenous problem between digital transformation and Tobin's Q. Therefore, the estimation result of fixed effect model is the main conclusion of this study.

4.5 Robustness Tests

In order to solve the potential endogeneity concerns arising from reverse causality, this study re-estimates the baseline model using a one-period lag of the core explanatory variable—digital transformation (ln_digital)—denoted as L.ln_digital. This lagged specification serves as a robustness check. The corresponding regression outcomes are reported in Table 5. As shown in the table, the estimated coefficient for the one-period lagged digital transformation variable (L.ln_digital) with respect to Tobin's Q (TobinQ) is 0.037, statistically significant at the 5% level (p = 0.012). This finding implies that, even after controlling for reverse causality, digital transformation continues to exert a significantly positive influence on firm value, which aligns well with the baseline regression results. Moreover, the signs and statistical significance of the control variables remain largely unchanged.

The COVID-19 outbreak in 2020-2022 seriously disrupted the financial markets in China, causing great fluctuations in the whole market. Companies have suffered bad consequences because of their usual work, the work of making products and the state of money. Therefore, the value of Tobin's Q in these three years may be mixed with strange values compared with the data in other years, and this period has become a special year. In order to correct this problem, in addition to the data from 2020 to 2022, I did another regression analysis. After excluding the data of this special year, the regression coefficient provided by digital transformation for Tobin's Q is 0.068, which is significant at the level of 1% (P = 0.016). This shows that after excluding the data of pandemic period, the obtained results are the same as those of the original baseline regression, and the robustness of the model is also confirmed.

Table 5. Robustness Test.

	(1)	(2)	(3)
	Tobin Q	**TobinQ**	**TobinQ**
ln_digital	0.053***		0.068***
	(0.014)		(0.016)
Size	-0.607***	-0.633***	-0.623***
	(0.041)	(0.049)	(0.039)
LEV	0.400***	0.312**	0.502***
	(0.115)	(0.129)	(0.122)
Growth	0.214***	0.275***	0.136***
	(0.022)	(0.025)	(0.025)
cash flow	1.339***	1.439***	1.386***
	(0.144)	(0.160)	(0.169)
Age	0.073***	0.092***	0.072***
	(0.005)	(0.006)	(0.005)
2011	0.000		0.000
	(.)		(.)
2012.year	-0.160***	0.000	-0.169***
	(0.035)	(.)	(0.034)
2013.year	0.231***	0.425***	0.226***
	(0.042)	(0.043)	(0.041)
2014	0.595***	0.808***	0.587***
	(0.045)	(0.051)	(0.044)

Table 5. (continued) Robustness Test.

	(1)	(2)	(3)
	Tobin Q	**TobinQ**	**TobinQ**
2015	1.749***	1.981***	1.758***
	(0.058)	(0.072)	(0.058)
2016	0.927***	1.030***	0.946***
	(0.043)	(0.048)	(0.042)
2017	0.427***	0.564***	0.469***
	(0.035)	(0.038)	(0.034)
2018	-0.153***	-0.066**	-0.112***
	(0.028)	(0.030)	(0.028)
2019	0.114***	0.192***	0.154***
	(0.027)	(0.029)	(0.027)
2020	0.304***	0.367***	
	(0.028)	(0.030)	
2021	0.375***	0.430***	
	(0.024)	(0.027)	
2022	0.004	0.032	
	(0.018)	(0.020)	
2023	0.037***	0.039***	0.039***
	(0.012)	(0.013)	(0.012)
2024	0.000	0.000	0.000
	(.)	(.)	(.)
L_ln_digital		0.037**	
		(0.015)	
_cons	13.670***	13.874***	13.938***
	(0.828)	(0.991)	(0.773)
N	30130	24,929	20,812

Standard errors in parentheses

Note: *** p < 0.01, ** p < 0.05, * p < 0.1; standard errors in parentheses; exclusion of special years refers to the exclusion of samples from 2020–2022

* p < 0.1, ** p < 0.05, *** p < 0.01

4.6 Heterogeneity Test:

In order to know whether the influence of digital transmission on firm value varies from industry to industry, the samples are divided into two sub-samples of manufacturing and non-manufacturing for further analysis. Table 6 shows the results of regression analysis of this group. The analysis results show that the digital transformation of the two industries has a statistically significant positive impact on firm value: the coefficient of manufacturing group is 0.045($p < 0.01$), and it is non-manufacturing.

Furthermore, the interaction test was carried out. The coefficient of the interaction term between ln_digital and manufacturing dummy variables was 0.016, but it failed the significance test (p = 0.539). The results show that there is no great difference between manufacturing and non-manufacturing industries in the effect of digital transmission on improving firm value. In other words, the positive effects of digital transformation are common in any industry.

Table 6. Industry Heterogeneity Test.

	(1)	(2)
	TobinQ	**TobinQ**
ln_digital	0.045***	0.055**
	(0.017)	(0.024)
Size	-0.559***	-0.656***
	(0.043)	(0.073)
LEV	0.396***	0.364**
	(0.143)	(0.184)
Growth	0.277***	0.122***
	(0.030)	(0.031)
Cash Flow	1.407***	1.124***
	(0.192)	(0.209)
Age	0.074***	0.070***
	(0.007)	(0.009)
2011	0.000	0.000
	(.)	(.)
2012.year	-0.095*	-0.224***
	(0.053)	(0.053)
2013	0.221***	0.276***
	(0.056)	(0.074)
2014	0.548***	0.670***
	(0.060)	(0.079)
2015	1.741***	1.777***
	(0.075)	(0.101)
2016	0.969***	0.849***
	(0.058)	(0.068)
2017	0.486***	0.322***
	(0.048)	(0.055)
2018	-0.167***	-0.139***
	(0.037)	(0.049)

Table 6. (continued) Industry Heterogeneity Test.

	(1) TobinQ	(2) TobinQ
2019	0.114***	0.103**
	(0.036)	(0.046)
2020	0.383***	0.154***
	(0.036)	(0.047)
2021	0.489***	0.150***
	(0.031)	(0.041)
2022	0.032	-0.064*
	(0.022)	(0.034)
2023	0.065***	-0.026
	(0.014)	(0.022)
2024	0.000	0.000
	(.)	(.)
_cons	12.553***	14.941***
	(0.854)	(1.489)
N	19,490	10,640

Standard errors in parentheses

Note: *** p < 0.01, ** p < 0.05, * p < 0.1

* p < 0.1, ** p < 0.05, *** p < 0.01

4.7 Mediation Analysis

To examine whether agency costs mediate the relationship between digital transformation and firm value, this study employs the three-step regression method (Baron & Kenny, 1986). Due to missing data, the actual sample size for the mediation analysis was 17,019 observations. The results of the mediation analysis are shown in Table 7:

Table 7. Mediation Test: The Mediating Role of Agency Costs.

	(1) TobinQ	(2) agen_cost	(3) TobinQ
ln_digital	0.048***	-0.004*	0.050***
	(0.019)	(0.002)	(0.019)
Size	-0.616***	-0.053***	-0.595***
	(0.050)	(0.005)	(0.049)
LEV	0.182	0.042**	0.165
	(0.134)	(0.017)	(0.135)
Growth	0.242***	-0.058***	0.266***
	(0.029)	(0.003)	(0.029)

Table 7. (continued) Mediation Test: The Mediating Role of Agency Costs.

	(1) TobinQ	(2) agen_cost	(3) TobinQ
cashflow	1.487***	-0.125***	1.538***
	(0.177)	(0.019)	(0.178)
Age	0.090***	0.001	0.090***
	(0.008)	(0.001)	(0.008)
2011	0.000	0.000	0.000
	(.)	(.)	(.)
2012.year	-0.206***	0.014***	-0.212***
	(0.047)	(0.005)	(0.047)
2013	0.319***	0.024***	0.309***
	(0.057)	(0.006)	(0.057)
2014	0.672***	0.032***	0.659***
	(0.058)	(0.005)	(0.058)
2015	2.167***	0.053***	2.145***
	(0.076)	(0.005)	(0.077)
2016	1.152***	0.062***	1.126***
	(0.055)	(0.005)	(0.055)
2017	0.562***	0.063***	0.536***
	(0.046)	(0.005)	(0.046)
2018	-0.105***	-0.017***	-0.098**
	(0.038)	(0.004)	(0.038)
2019	0.203***	-0.014***	0.209***
	(0.036)	(0.004)	(0.036)
2020	0.363***	-0.012***	0.368***
	(0.037)	(0.003)	(0.037)
2021	0.423***	-0.007**	0.426***
	(0.032)	(0.003)	(0.032)
2022.year	0.023	-0.007***	0.026
	(0.025)	(0.002)	(0.026)
2023.year	0.032*	-0.002	0.033*
	(0.018)	(0.002)	(0.018)
2024	0.000	0.000	0.000
	(.)	(.)	(.)

Table 7. (continued) Mediation Test: The Mediating Role of Agency Costs.

	(1) TobinQ	(2) agen_cost	(3) TobinQ
agen_cost			0.404**
			(0.180)
_cons	13.564***	1.333***	13.025***
	(0.991)	(0.092)	(0.975)
N	17019	17019	17019

Standard errors in parentheses

Note: *** p < 0.01, ** p < 0.05, * p < 0.1; standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

First, if Tobin's Q (tobinq) is used to regress the digital conversion (ln _ digital), the coefficient is 0.0484. At the level of 1%, there is a significant positive relationship statistically, which can be confirmed to have a good impact on enterprise value. Then we use agency costs(agen_cost) to regress the digital conversion, and the coefficient is -0.0039, which is meaningful at the level of 10%. This shows that digital conversion can reduce agency problems well. Thirdly, if both digital transmission and agency cost are added into the model, the coefficient of agency cost is 0.4044, which is positively correlated with Tobin's Q at the significance level of 5%. On the other hand, the coefficient of digital transformation remains positive, which is statistically significant.

Therefore, we come to the conclusion that agency cost plays a part of the intermediary role between digital transmission and enterprise value. Digital conversion improves enterprise value by reducing agency cost. Its communication mechanism can be analyzed from three aspects: alleviating information asymmetry, limiting operators' behavior and improving governance efficiency.

5. RESEARCH CONCLUSIONS

Using the data of A-share listed companies in China from 2011 to 2024, this study actually investigates how digital transformation affects the value of enterprises and the mechanism of its influence. After the basic regression analysis, after considering the enterprise size, leverage ratio, sales growth rate, cash flow level, enterprise age and inter-annual fixed effect, the value of digital transformation (ln _ digital) to enterprises (Tobin's Q). The results show that the market value will increase by about 0.053 units on average after the digitization level is increased by one unit, which is the initial evidence of a strong positive relationship between digital transformation and enterprise value. In order to verify the stability of these results, we delayed the central description variable for one period, and then carried out robustness checks, but the results remained unchanged. In addition, there is no obvious difference between manufacturing and non-manufacturing industries in the good influence of digitalization on improving enterprise value, which undoubtedly shows that promoting digital transformation in all industries is a good growth policy.

In addition, the study will also check the working mediating mechanism. When corporate agency costs is used as a mediating variable, analysis will convert the displayed figures into big data, artificial intelligence, use digital monitoring platforms and other tools to reduce information asymmetry, which can enable more effective supervision of managerial conduct, thus greatly improving the market value of firm. According to the findings above, we can draw several policy implications. First, governments must continue to expand their supportive measures for digital economy. This includes strengthening incentives of fiscal and tax, offering technical assistance for corporate digitalization efforts, making public digital service platforms, including reducing the relevant barrier and costs of enterprises, and promoting digital transformation of the whole sector. Secondly, listed companies should first consider the benefits of digital transformation to governance. This is to strengthen the introduction of digital technologies in the fields of internal oversight, administration and information disclosure. By using digital tools to improve governance mechanism and reduce agency expenses, enterprises can give full play to the full power of digital value creation. Third, regulatory bodies can use digital technologies to better supervise listed companies. In this way, information disclosure will become clearer faster, and the

ability to monitor and restrict the behavior of operators will become stronger. These efforts will help to create a good institutional environment, and digital conversion can play a good role in governance.

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