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The Impact of Digital Transformation on Corporate Financialization and Its Mechanisms: Evidence from Non-Financial Listed Companies in Shanghai and Shenzhen A-Shares, 2009-2023

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Abstract

Currently, corporate financialization has become prominent, and the issue of the economy "shifting from the real to the virtual" is increasingly acute, posing significant challenges to the development of the real economy. As a core strategic pathway for driving industrial upgrading and value reconfiguration, digital transformation holds important implications for exploring its dynamic effects on the real economy and promoting high-quality development of real industries. This paper takes non-financial listed companies in Shanghai and Shenzhen A-shares from 2009 to 2023 as the research sample and empirically examines the impact of digital transformation on corporate financialization and its underlying mechanisms. The results show that digital transformation significantly inhibits corporate financialization, reduces the proportion of financial asset allocation, and exerts a positive effect on the development of the real economy. Specifically, digital transformation suppresses financialization by enhancing internal control quality and reducing information asymmetry, thereby improving commercial credit financing, alleviating financing constraints, and weakening the "precautionary" (liquidity reservoir) motive; it also promotes resource allocation efficiency, fosters corporate innovation, and increases the return on real investment, thereby curbing the "substitution" motive. Heterogeneity analysis reveals that the inhibitory effect of digital transformation on corporate financialization is more pronounced in non-state-owned enterprises and non-high-tech enterprises. This study proposes solutions to address the existing financialization problems in real-sector enterprises, underscores the critical importance of real economy development, and elucidates the mechanisms and positive impacts through which digital transformation promotes the shift of enterprises "from the virtual back to the real" and empowers the real economy.

Keywords

digital transformation, corporate financialization, nature of property rights, high-tech enterprises

1. Introduction

In the era of the digital economy, digital transformation has emerged as the core driving force reshaping industrial competition patterns and revitalizing the vitality of the real economy. At the national level, a series of policies have been successively introduced, including the "Data Elements ×" Three-Year Action Plan (2024-2026), which promotes the deep integration of data elements with traditional production factors and provides

institutional safeguards for industrial upgrading. However, the problem of corporate financialization—"shifting from the real to the virtual" in the real economy—has become increasingly prominent. Enticed by the high returns of the financial sector, real-sector enterprises have tilted resource allocation toward financial investments, forming two core motives: the "precautionary reservoir" motive and the "substitution" motive. This phenomenon crowds out resources for real investment and innovation, heightens operational risks, and severely constrains the high-quality development of the real economy. Against this backdrop, investigating the impact of digital transformation on corporate financialization and its underlying mechanisms holds significant theoretical and practical importance.

Existing studies have explored the economic effects of digital transformation and the formation mechanisms of corporate financialization, but they predominantly focus on the macro-level technological and managerial transformation effects of digitalization. There remains insufficient excavation of the internal pathways through which digital transformation inhibits corporate financialization by optimizing micro-level resource allocation and improving operational efficiency. Moreover, heterogeneity analyses under different firm characteristics and industry environments are limited, and no systematic analytical framework has yet been formed. Accordingly, this paper takes non-financial listed companies in Shanghai and Shenzhen A-shares from 2009 to 2023 as the sample, constructs variable indicators by combining text analysis with financial data, and employs methods such as descriptive statistics, baseline regression, robustness tests, and heterogeneity tests to examine the inhibitory effect of digital transformation on corporate financialization and its underlying logic. The innovations of this paper lie in the following: constructing an analytical framework of "digital transformation–motive regulation–financialization inhibition–real economy development," deeply dissecting the dual-path influence mechanisms, clarifying the moderating roles of the nature of property rights and industry technological characteristics, and providing targeted references for enterprises to optimize transformation strategies and for governments to refine digital economy policies, thereby further enriching the research system in related fields.

2. Literature Review and Theoretical Hypotheses

2.1 Literature Review

2.1.1 Literature on Digital Transformation

Digital transformation, as the core pathway for enterprises to achieve strategic upgrading and value reconfiguration in the digital economy era, has formed a multidimensional academic lineage in terms of its conceptual definition and economic consequences. Early studies largely equated digital transformation with large-scale application of information technology, viewing its core value as optimizing business processes, reducing management costs, and achieving marginal improvements in operational efficiency through the establishment of information systems [1, 2]. As the integration of digital technologies with industries deepens, scholars have gradually moved beyond the "technological tool" perspective, proposing that digital transformation constitutes a systemic change centered on data elements and supported by digital technologies. It encompasses comprehensive reshaping of organizational structures, business models, and value creation logic [3, 4].

2.1.2 Literature on Corporate Financialization

Corporate financialization represents the core manifestation of the real economy "shifting from the real to the virtual." Academia generally defines it as a shift in the focus of enterprise resource allocation from real operations to financial investments, specifically manifested in an increasing proportion of financial assets and a declining proportion of real investment [5, 6]. The economic consequences of corporate financialization are predominantly negative. Existing research has developed a relatively complete theoretical system around three core themes: allocation motives, influencing factors, and economic consequences.

Regarding allocation motives, the "precautionary reservoir" motive and the "substitution" motive have become the two widely accepted core logics in academia [7]. The "precautionary reservoir" motive originates from Keynes's (1936) precautionary saving theory [8], positing that firms hold highly liquid financial assets primarily to hedge against potential future liquidity risks and avoid operational disruptions or efficiency declines due to temporary funding shortages. This motive is more pronounced in firms facing stronger

financing constraints. Duchin et al. [9] confirm that financial assets, with their strong liquidity and low adjustment costs, serve as a "forward-looking" strategy for firms to cope with long-term financial uncertainty, effectively mitigating the adverse impacts of funding chain disruptions on production, operations, and innovation. In contrast, the "substitution" motive arises from the return gap between real investment and financial investment. When returns in virtual sectors such as finance and real estate significantly exceed those in the real economy, management tends to redirect resources from real operations to financial investments to pursue short-term excess returns and optimize short-term performance indicators [10, 11]. Cao Wei et al. [11] further point out that the first-type agency problem arising from the separation of ownership and management rights exacerbates management's short-term profit-seeking tendency, thereby reinforcing the "substitution" motive of corporate financialization.

However, existing research still has shortcomings: most studies focus on the macro-level technological and managerial transformation effects of digital transformation, with insufficient in-depth exploration of the micro-level pathways through which it inhibits financialization by optimizing resource allocation and improving operational efficiency. Moreover, heterogeneity under different firm characteristics and industry environments has not been adequately examined, leaving room for the present study.

2.2 Theoretical Analysis and Research Hypotheses

Corporate financialization is a widespread issue among enterprises today. It refers to enterprises biasing resources toward capital operations, with assets increasingly allocated to financial investments rather than production and operations, and profit sources gradually shifting toward non-productive financial activities. Its core characteristic is the pursuit of capital appreciation rather than operating profits. The primary drivers of corporate financialization are the precautionary saving motive and the substitution motive. Other major approaches to alleviating corporate financialization include strengthening financial regulation and adjusting tax policies at the macro and institutional levels, as well as optimizing equity structures and constraining managerial behavior at the corporate governance level. This paper focuses on the significant inhibitory effect of digital transformation on corporate financialization and its role in promoting the shift "from the virtual back to the real." On one hand, digital transformation reduces information asymmetry, alleviates financing constraints, and weakens the precautionary motive; on the other hand, it optimizes resource allocation efficiency, enhances returns on real investment, and curbs the substitution motive.

2.2.1 Weakening the "Precautionary Reservoir" Motive

Based on precautionary saving theory [8], one key reason firms hold cash is to hedge against potential future liquidity risks and avoid operational interruptions or efficiency declines due to temporary funding shortages. Digital transformation alleviates financing constraints and enhances financing capacity by reducing information asymmetry in both commercial credit financing and bank credit financing, thereby weakening the precautionary motive and lowering the degree of corporate financialization. In terms of commercial credit financing, digital transformation reduces supply chain information risks, optimizes full-process management efficiency, and enhances financing feasibility. It significantly improves upstream suppliers' credit financing while having a limited but still relieving effect on downstream customers' credit pressure. The optimization effect is more pronounced in financially underdeveloped regions and state-owned enterprises. Additionally, supply chain commercial credit can substitute for part of debt financing, further easing overall financing constraints. In bank-enterprise credit financing, digital transformation mitigates information asymmetry between banks and enterprises through dual pathways: enhancing information transparency and strengthening internal control systems. This reduces banks' risk assessment costs and credit thresholds, making it easier for firms to obtain loan support and further diminishing the precautionary demand for financial assets.

2.2.2 Inhibiting the "Substitution" Motive

The "substitution" motive of corporate financialization stems from higher investment returns on financial assets compared to the real economy, prompting firms to shift funds from real sectors to financial investments in pursuit of higher yields. This motive squeezes the development space of the real economy, making firms increasingly reliant on financial channels for profits. Digital transformation inhibits the "substitution" motive by comprehensively elevating returns on real investment and narrowing the return gap. When returns on real investment rise significantly, closing or even reversing the gap with financial assets, firms' willingness to allocate to real assets strengthens while preference for financial investment declines. The "substitution" motive

is effectively curbed, thereby enabling firms to refocus on their core businesses and achieve the desirable outcome of "shifting from the virtual back to the real."

Based on the above analysis, digital transformation inhibits corporate financialization by weakening the "precautionary reservoir" motive and curbing the "substitution" motive. This paper proposes the following hypothesis:

Hypothesis H1: Digital transformation significantly inhibits corporate financialization and promotes the shift of enterprises "from the virtual back to the real."

3. Research Design

3.1 Sample Selection and Data Sources

This paper selects listed companies in Shanghai and Shenzhen A-shares from 2009 to 2023 as the initial sample and applies the following treatments: (1) exclusion of financial industry samples; (2) exclusion of ST and *ST companies; (3) exclusion of samples with missing variable data; (4) to mitigate the impact of outliers on the final analysis results, continuous variables are winsorized at the 1% and 99% levels. After screening, a final effective sample of 38,431 observations is obtained. The relevant data are primarily sourced from the CSMAR database.

3.2 Variable Selection

3.2.1 Dependent Variable

Corporate financialization (Fin). Drawing on existing studies for the measurement of corporate financialization [12], this paper adopts the proportion of financial assets to total assets as the indicator. The specific calculation formula is: (Trading financial assets + Derivative financial assets + Net loans and advances + Net available-for-sale financial assets + Net held-to-maturity investments + Net investment real estate) / Total assets. Robustness tests are conducted in this study.

3.2.2 Independent Variable

Digital transformation (DIGI_text). This paper constructs the core measurement indicator using text analysis: with "artificial intelligence," "big data," "cloud computing," "blockchain," "Internet of Things," "digitalization," "Internet," and "informatization" as core seed words, an expanded word set containing 186 digital technology-related terms is formed. The frequency of occurrence of this word set in the annual reports of listed companies is counted and standardized by the total text length of the annual report to obtain the core indicator of digital transformation (DT). For robustness tests, two alternative measures are used: first, the corporate digital transformation index (DT_index) from the CSMAR database, following existing studies; second, the proportion of disclosure length in sections related to "digital transformation" and "digital technology application" in the annual reports (DT_text) as a supplementary indicator.

3.2.3 Control Variables

The selection of control variables refers to firm size, return on total assets, firm age, asset-liability ratio, net cash flow from operating activities, operating revenue growth rate, and other financial variables, as well as corporate governance variables such as the proportion of independent directors, CEO duality, and the shareholding proportion of the largest shareholder, as shown in Table 1.

Table 1: Variable Definitions

Type	Variable Name	Symbol	Measurement Method
Dependent Variable	Corporate Financialization	Fin	(Trading financial assets + Derivative financial assets + Net loans and advances + Net available-for-sale financial assets + Net held-to-maturity investments + Net investment real estate) / Total assets
Independent Variable	Digital Transformation	DIGI_text	Measured using text analysis of corporate digital transformation

Type	Variable Name	Symbol	Measurement Method
Control Variables	Firm Size	assets	Natural logarithm of total assets
	Asset-Liability Ratio	lev	Total liabilities / Total assets
	Return on Total Assets	ROA	Net profit / Average balance of total assets
	Operating Cash Flow	Incash	Net cash flow from operating activities / Total assets
	Firm Age	age	Natural logarithm of (Current year – Year of establishment + 1)
	Operating Revenue Growth Rate	growth	((Current period operating revenue / Previous period operating revenue) – 1) × 100%
	Shareholding of Largest Shareholder	top1	Number of shares held by the largest shareholder / Total share capital × 100%
	Proportion of Independent Directors	indirect	Number of independent directors / Number of board members
	CEO Duality	dual	1 if the chairman and general manager are the same person; otherwise 0

3.3 Model Specification

To test Hypothesis H1 and examine the impact of digital transformation on corporate financialization, this paper constructs the following baseline regression model:

$$Fin_{i,t}=\beta_0+\beta_1 DT_{i,t}+\beta_k \sum Controls_{i,t}+Firm_i+Year_t+\varepsilon_{i,t}$$

where i denotes individual firms; t denotes years; $Fin_{i,t}$ is the dependent variable corporate financialization, measured by the proportion of financial assets to total assets; $DT_{i,t}$ is the core independent variable digital transformation, measured through text analysis; $Controls_{i,t}$ represents a series of control variables, including financial variables such as firm size, return on total assets, and asset-liability ratio, as well as corporate governance variables such as the proportion of independent directors and CEO duality; $Firm_{i,t}$ is firm fixed effects, used to control for time-invariant firm-specific characteristics; $Year_t$ is year fixed effects, used to exclude interference from common annual factors such as macroeconomic conditions; β_0 is the intercept term; β_1 and β_k are coefficients to be estimated. The sign and significance of the core coefficient $DT_{i,t}$ are of primary interest; if $DT_{i,t}$ is significantly negative, it supports Hypothesis H1, indicating that digital transformation inhibits corporate financialization.

4. Empirical Analysis

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics of the main variables. For corporate financialization (Fin), the mean is 0.0050 and the median is 0, indicating that more than half of the sample observations have no financial asset allocation. The minimum value of Fin is 0, and the maximum is 0.1530, reflecting that some enterprises exhibit financial asset allocation behavior with a relatively high degree of dependence on financial assets. For digital transformation (DIGI_text), the mean is 0.0129, the median is 0.0055, the minimum is 0, and the maximum is 0.1200. The median is lower than the mean, indicating a right-skewed distribution, which suggests that the majority of enterprises have digital transformation levels below the average, the overall degree of digital transformation is not high, and there are large gaps in digital transformation progress across enterprises.

Table 2: Descriptive Statistics

Variable	Observations	Mean	Median	Minimum	Maximum	Standard Deviation
fin	38431	0.0050	0.0000	0.0000	0.1530	0.0210
DIGI_text	38431	0.0129	0.0055	0.0000	0.1200	0.0206
assets	38431	22.2900	22.0900	20.0000	26.3500	1.2900

Variable	Observations	Mean	Median	Minimum	Maximum	Standard Deviation
ROA	38431	0.0358	0.0357	-0.2300	0.1970	0.0609
age	38431	1.9940	2.1970	0.0000	3.3320	0.9550
lev	38431	0.4270	0.4200	0.0563	0.8940	0.2040
lncash	38431	19.3800	19.3000	15.2300	23.7900	1.6280
indirect	38431	37.6200	36.3600	33.3300	57.1400	5.3250
dual	38431	0.2830	0.0000	0.0000	1.0000	0.4500
top1	38431	34.1500	31.9500	8.4100	74.3000	14.8700
growth	38431	0.3350	0.1160	-0.6820	6.2780	0.9000

4.2 Baseline Regression Results

Model (1) is used to test the impact of digital transformation on corporate financialization. The empirical results are shown in Table 3. Columns (1) to (3) report the regression results using the digital transformation measure. Column (1) shows the regression results controlling for industry and year fixed effects. The coefficient on digital transformation (DIGI_text) is -0.0145, significantly negative at the 5% level, indicating that digital transformation exerts a significant inhibitory effect on corporate financialization. Column (2) adds firm financial control variables, with the coefficient becoming -0.0139; the model explanatory power remains roughly similar, and digital transformation continues to significantly inhibit corporate financialization, further supporting Hypothesis H1. Column (3) includes all control variables, with the coefficient on digital transformation at -0.0117, still significantly negative. This demonstrates that regardless of whether control variables are included, the coefficient on digital transformation (DIGI_text) remains significantly negative.

Table 3: Baseline Regression Results

	(1)	(2)	(3)
	fin	fin	fin
DIGI_text	-0.0145**	-0.0139**	-0.0117*
	(-2.3519)	(-2.1587)	(-1.7949)
assets		0.0002	-0.0002
		(1.1484)	(-0.8524)
ROA		0.0062**	0.0117***
		(2.4879)	(4.5321)
lev		-0.0013	-0.0028***
		(-1.2250)	(-2.7199)
lncash		-0.0003**	-0.0004***
		(-2.4322)	(-2.7577)
growth		-0.0002	-0.0002
		(-0.9333)	(-0.9216)
age			0.0022***
			(12.0993)
indirect			0.0000
			(1.2314)
dual			0.0002
			(0.8119)
top1			-0.0000
			(-0.6988)
_cons	0.0052***	0.0065**	0.0116***
	(28.2286)	(2.1105)	(3.4089)
N	38416	30978	30210
r2_a	0.2320	0.2280	0.2342

*Notes: t-statistics are in parentheses; ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

4.3 Robustness Tests

To enhance the reliability of the baseline regression conclusions, this paper conducts robustness tests using three-period lagged variables, province fixed effects, and subsample regressions. The results are as follows:

4.3.1 Three-Period Lagged Test

The baseline regression may suffer from potential reverse causality, where firms with lower financialization levels may be more willing to invest resources in digital transformation, leading to estimation bias. To mitigate this endogeneity issue, following the approach of Xie Yanxiang et al. [13], this paper uses lagged one-period, two-period, and three-period values of the core explanatory variable for robustness testing.

The inhibitory effect of digital transformation on corporate financialization exhibits a certain time-lag transmission. The investment, application, and manifestation of digital technology effects require multiple stages, including technology implementation, process adaptation, and efficiency improvement. Its alleviation of financing constraints and enhancement of real profitability are not instantaneous but involve lagged effects. Using lagged terms not only effectively avoids reverse causality interference but also more accurately captures the long-term impact of digital transformation on corporate financialization, further validating the reliability of the core conclusions.

The regression results are shown in Table 4. The coefficients on the one-period, two-period, and three-period lagged digital transformation variables are -0.0143, -0.0179, and -0.0214, all significantly negative. Moreover, as the lag periods increase, the absolute values of the coefficients gradually enlarge, and the model goodness-of-fit (r2_a) continues to improve. This indicates that the inhibitory effect of digital transformation on corporate financialization is long-term and persistent, with the effect becoming more pronounced over time and the suppression of financialization strengthening continuously.

This result suggests that the manifestation of digital transformation's impact is a dynamic accumulation process: in the short term, digital investments mainly complete infrastructure construction and preliminary process optimization, with limited improvements in financing environments and profitability; in the medium to long term, as digital technologies deeply integrate with core businesses, information asymmetry continues to decrease, returns on real investment steadily rise, the "precautionary reservoir" and "substitution" motives are persistently weakened, and the inhibitory effect on financialization becomes increasingly evident.

The three-period lagged test results further confirm the robustness of the baseline regression conclusions, ruling out interference from reverse causality and demonstrating that digital transformation indeed significantly inhibits corporate financialization through a stable long-term transmission mechanism rather than a short-term random phenomenon.

Table 4: Three-Period Lagged Test

	(1)	(2)	(3)
	Lag 1 period	Lag 2 periods	Lag 3 periods
l_DIGI	-0.0143*		
	(-1.9297)		
l_DIGI2		-0.0179**	
		(-2.0652)	
l_DIGI3			-0.0214**
			(-2.1911)
	(-1.2898)	(-0.9703)	(-0.7634)
ROA	0.0122***	0.0115***	0.0109***
	(4.3065)	(3.8883)	(3.5128)
age	0.0031***	0.0036***	0.0037***
	(11.7838)	(10.7429)	(9.3379)
lev	-0.0032***	-0.0047***	-0.0061***
	(-2.7754)	(-3.6945)	(-4.2764)
lncash	-0.0004***	-0.0005***	-0.0006***
	(-2.7258)	(-2.7633)	(-3.0518)
indirect	0.0000	0.0000	0.0001*
	(1.3570)	(1.4325)	(1.8827)
dual	0.0002	0.0002	0.0002
	(0.7269)	(0.5987)	(0.4391)
top1	-0.0000	-0.0000	-0.0000
	(-0.7679)	(-1.2723)	(-1.2381)
growth	-0.0003	-0.0003	-0.0003

	(-1.1944)	(-1.1807)	(-0.9350)
_cons	0.0137***	0.0133***	0.0144***
	(3.6426)	(3.2878)	(3.2803)
N	26135	22863	20077
r2_a	0.2460	0.2533	0.2646

*Notes: t-statistics are in parentheses; ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

4.3.2 Province Fixed Effects and Subsample Regression Results

Considering the significant differences across Chinese provinces in digital economy policy support, financial market development, and industrial foundations, which may potentially confound the relationship between digital transformation and financialization, this paper further includes province fixed effects to control for time-invariant province-specific characteristics. The regression results are shown in Column (1) of Table 5.

The results indicate that the coefficient on digital transformation (DIGI_text) is -0.0120, significant at the 10% level with a negative sign, and R^2 is 0.2380. This shows that after controlling for province fixed effects, digital transformation still exerts an inhibitory effect on corporate financialization, with no change in direction. This result validates the baseline regression conclusions, confirming the robustness of the inhibitory effect after excluding interference from province-specific characteristics.

To further verify the generalizability of the conclusions, this paper reconstructs a subsample and performs regression again. The results are shown in Column (2) of Table 5. In the subsample regression, the coefficient on digital transformation (DIGI_text) is -0.0117, significant at the 10% level with a negative sign, consistent with the core conclusion from the baseline regression that digital transformation significantly inhibits corporate financialization. Additionally, the signs and significance levels of the control variables remain basically stable, further supporting the robustness of the findings in this paper.

Table 5: Province Fixed Effects and Subsample Regression Results

	(1)	(2)
	Province	Subsample
DIGI_text	-0.0120*	-0.0117*
	(-1.8484)	(-1.7949)
assets	-0.0001	-0.0002
	(-0.6735)	(-0.8524)
ROA	0.0119***	0.0117***
	(4.5249)	(4.5321)
age	0.0023***	0.0022***
	(12.2253)	(12.0993)
lev	-0.0025**	-0.0028***
	(-2.4995)	(-2.7199)
lncash	-0.0004***	-0.0004***
	(-2.9069)	(-2.7577)
indirect	0.0000	0.0000
	(1.1298)	(1.2314)
dual	0.0001	0.0002
	(0.2896)	(0.8119)
top1	-0.0000	-0.0000
	(-0.9084)	(-0.6988)
growth	-0.0001	-0.0002
	(-0.4625)	(-0.9216)
_cons	0.0111***	0.0116***
	(3.2016)	(3.4089)
N	30210	30210
r2_a	0.2380	0.2342

*Notes: t-statistics are in parentheses; ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

5. Heterogeneity Analysis

5.1 Heterogeneity Test by Nature of Property Rights

The nature of enterprise property rights serves as a key dimension influencing resource allocation, governance mechanisms, and strategic decision-making, potentially moderating the relationship between the degree of digital transformation and corporate financialization. Differences in the application of digital transformation lead to varying impacts on corporate financialization. Enterprises can be classified into state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs) based on property rights. SOEs and non-SOEs exhibit significant differences in financing environments, policy orientation, and operational objectives: SOEs typically enjoy more stable financing channels, stronger policy support, and bear corresponding social responsibilities, resulting in relatively weaker motives to pursue short-term financial market returns; in contrast, non-SOEs face more pronounced financing constraints and greater market competition pressure, making them more susceptible to the attraction of high returns from financial assets. Consequently, the moderating effect of digital transformation on financialization behavior may be more prominent in non-SOEs. Based on this, the sample is divided into SOEs and non-SOEs to examine the heterogeneous impact of property rights on the relationship between digital transformation and corporate financialization. The regression results are presented in Table 6.

The results show significant heterogeneity in the inhibitory effect of digital transformation on corporate financialization across property rights: In the SOE group (Column 1), the coefficient on digital transformation (DIGI_text) is -0.0001 and fails to pass significance testing, indicating that the inhibitory effect of digital transformation on financialization in SOEs is not significant. A possible reason is that SOEs inherently possess strong financing advantages and weaker financialization motives, limiting the incremental improvement brought by digital transformation; moreover, SOE operational decisions are more influenced by policy guidance, with digital resource allocation often prioritizing social responsibility fulfillment and industry leadership over modulating financialization behavior. In the non-SOE group (Column 2), the coefficient on digital transformation (DIGI_text) is -0.0198, significantly negative at the 5% level, demonstrating that digital transformation can significantly inhibit financialization tendencies in non-SOEs. This aligns with theoretical expectations: non-SOEs can enhance operational efficiency, alleviate financing constraints, and strengthen core business profitability through digital transformation, thereby reducing the motive for financial asset allocation; the real-sector empowerment effect of digital transformation is thus more pronounced in non-SOEs. In summary, the heterogeneity analysis indicates that the inhibitory effect of digital transformation on corporate financialization primarily manifests in non-SOEs, while it is not significant in SOEs. The nature of property rights constitutes an important boundary condition influencing this relationship.

Table 6: Heterogeneity Analysis

	(1)	(2)	(3)	(4)
	SOEs	Non-SOEs	High-tech	Non-high-tech
DIGI_text	-0.0001	-0.0198***	-0.0155**	-0.0253**
	(-0.0089)	(-2.8408)	(-2.2492)	(-2.0797)
assets	0.0002	-0.0002	-0.0002	-0.0001
	(0.5333)	(-0.5977)	(-0.5700)	(-0.4545)
ROA	0.0162***	0.0073**	0.0092***	0.0130***
	(3.0255)	(2.5761)	(2.6540)	(3.8308)
age	0.0029***	0.0020***	0.0019***	0.0023***
	(7.7227)	(8.4552)	(5.4341)	(10.6854)
lev	-0.0077***	-0.0002	-0.0001	-0.0039***
	(-3.9723)	(-0.1569)	(-0.0343)	(-3.1189)
lncash	-0.0007***	-0.0002	-0.0002	-0.0005***
	(-2.8980)	(-1.1369)	(-0.8683)	(-2.7203)
indirect	0.0001**	-0.0000	0.0000	0.0000
	(2.1198)	(-0.3254)	(0.1680)	(1.3082)
dual	0.0004	0.0001	0.0007	0.0000
	(0.5383)	(0.2682)	(1.6253)	(0.1137)
top1	-0.0000	-0.0000	-0.0000	-0.0000
	(-0.2621)	(-0.0561)	(-1.3423)	(-0.2046)

growth	-0.0006**	0.0003	-0.0002	-0.0002
	(-2.5523)	(0.8283)	(-0.5819)	(-0.7572)
_cons	0.0088	0.0080*	0.0084*	0.0120***
	(1.6450)	(1.8334)	(1.7715)	(2.8909)
N	11161	19049	7978	22232
r2_a	0.2532	0.2241	0.2060	0.2412

*Notes: t-statistics are in parentheses; ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

5.2 Heterogeneity Test by High-Tech Industry Status

Differences in technological characteristics, factor intensity, digital foundations, and application scenarios across industries lead to heterogeneity in the inhibitory effect of digital transformation on corporate financialization. From the current state of digital development, high-tech industries possess superior technological endowments, with significantly higher digital penetration and application depth compared to non-high-tech industries. However, digital transformation in high-tech industries has often entered a mature stage, leaving relatively limited marginal improvement space for further upgrades. Non-high-tech industries, dominated by traditional production models, started digitalization later with relatively weak foundations and lower embedding of data elements in production and operations. Nevertheless, the application of technology and process optimization during transformation can yield more prominent improvements in operational efficiency, resulting in greater marginal gains from digital upgrades.

Digital transformation in non-high-tech industries is more effective at reducing information asymmetry. Traditional operating models in these industries feature lower information transmission efficiency and insufficient transparency. Digital transformation, by building standardized data transmission systems and optimizing information disclosure processes, can rapidly narrow information gaps, significantly alleviate financing constraints, and thereby weaken the "precautionary reservoir" motive; at the same time, cost reduction and efficiency gains from digital transformation can quickly enhance profitability in real operations, narrowing the return gap with financial investments and inhibiting the "substitution" motive. In contrast, high-tech industries already exhibit higher information transparency, leaving limited room for digital transformation to further reduce information asymmetry, while their core competitiveness heavily relies on technological innovation, resulting in relatively moderate incremental empowerment effects from digital transformation and a less pronounced inhibitory impact on financialization compared to non-high-tech industries. Accordingly, this paper expects the inhibitory effect of digital transformation on corporate financialization to be more prominent in non-high-tech industries.

The regression results are shown in Table 6. The results indicate heterogeneity in the inhibitory effect across industries: In the high-tech industry group (Column 3), the coefficient on DIGI_text is -0.0155, significantly negative at the 5% level; in the non-high-tech industry group (Column 4), the coefficient on DIGI_text is -0.0253, also significantly negative at the 5% level. However, inter-group coefficient comparison shows that the absolute value of the coefficient in the non-high-tech group is larger than in the high-tech group, confirming the theoretical expectation: non-high-tech industries, leveraging the marginal improvement advantage of digital transformation, exhibit a stronger inhibitory effect on corporate financialization.

The underlying logic of this finding is as follows: High-tech industries have robust digital foundations, with transformation shifting from "incremental breakthroughs" to "stock optimization," resulting in relatively limited improvements in information asymmetry and real profitability enhancement; non-high-tech industries display clear "latecomer advantages," and the leap from low to medium-high digital levels yields more significant gains in data-driven information transparency and operational efficiency, more effectively alleviating financing constraints, elevating returns on real investment, and thereby exerting a stronger inhibitory effect on corporate financialization. This result suggests that the inhibitory effect of digital transformation on corporate financialization is closely tied to the industry's own stage of digital development: the greater the marginal improvement space, the more significant the inhibitory effect.

6. Conclusion

6.1 Research Conclusions

In the context of the continuous development of the digital economy and its deep integration with the real economy, this paper takes non-financial listed companies in Shanghai and Shenzhen A-shares from 2009 to 2023 as the research sample to examine the impact of digital transformation on corporate financialization. The findings are as follows: Digital transformation significantly inhibits corporate financialization and promotes the shift of enterprises "from the virtual back to the real." This conclusion remains robust under a series of tests. The inhibitory effect operates through the following pathways: On one hand, digital transformation enhances internal control quality and reduces information asymmetry, thereby strengthening commercial credit financing capabilities, optimizing bank-enterprise relationships, alleviating financing constraints, and weakening the "precautionary reservoir" motive for financial asset allocation. On the other hand, digital transformation empowers improvements in industrial production efficiency and operational management efficiency, promotes resource integration and innovation, narrows the return gap between real and financial investments, and curbs the "substitution" motive. Heterogeneity analysis reveals that this inhibitory effect is more pronounced in non-state-owned enterprises, primarily due to their stronger financing constraints and greater urgency for real-sector empowerment through digital transformation. At the same time, the inhibitory effect of digital transformation on financialization is stronger in non-high-tech industries than in high-tech industries, highlighting the "latecomer advantage" of digital transformation in traditional industries.

6.2 Managerial Implications and Policy Recommendations

In terms of managerial implications, enterprises should regard digital transformation as a core strategy for inhibiting financialization and achieving high-quality development. Non-state-owned enterprises should increase digital investments, focusing on supply chain digitalization and digital bank-enterprise docking to alleviate financing constraints. Non-high-tech industries should leverage their "latecomer advantage" by prioritizing digital upgrades in key areas such as production processes and customer management to rapidly enhance real-business profitability. At the same time, enterprises need to emphasize the deep integration of digitalization with core businesses to avoid superficial technology application. Through data-driven cost reduction and efficiency gains, as well as innovation breakthroughs, enterprises can fundamentally reduce dependence on financial investments.

In terms of policy recommendations: First, establish a differentiated digital support system. Provide targeted tax incentives and financing interest subsidies to non-state-owned enterprises and traditional industries to encourage digital infrastructure construction; for non-high-tech industries, build industry-wide common digital technology platforms to lower transformation thresholds. Second, improve supporting institutions for the digital factor market. Implement the Interim Provisions on Accounting Treatment Related to Enterprise Data Resources to standardize the accounting and disclosure of enterprise data assets and strengthen quantitative evaluation of digital transformation effects; establish cross-departmental data-sharing mechanisms to reduce information acquisition costs during digital transformation. Third, strengthen the alignment of digital talent supply and demand. Support universities and enterprises in jointly building digital training bases to cultivate composite talents adapted to traditional industry transformation; implement talent introduction subsidies, skills training funding, and other policies to alleviate enterprise shortages of digital talent.

6.3 Research Limitations and Future Directions

The limitations of this study primarily lie in three aspects: First, the measurement of digital transformation relies on text analysis and existing database indicators, which fail to fully capture differences in the depth and quality of enterprises' digital transformation, potentially introducing certain measurement errors. Second, the sample is limited to listed companies in Shanghai and Shenzhen A-shares, excluding small and medium-sized enterprises (SMEs) and non-listed companies, so the generalizability of the conclusions requires further validation. Third, the study does not deeply explore the differential impacts of different stages of digital transformation, e.g., infrastructure construction versus deep integration applications, on corporate financialization, leaving room for expanding the mechanism analysis.

Future research can advance in the following directions: First, optimize measurement indicators for digital transformation by incorporating multi-dimensional data such as enterprise digital investment amounts, patented technologies, and the proportion of digitized business operations to construct a more precise measurement system. Second, expand the sample scope to include SMEs and non-listed companies, analyzing heterogeneity in the impact of digital transformation on financialization across different firm sizes and types. Third, refine mechanism research by investigating specific pathways through which digital transformation affects corporate financialization at different stages, and examining moderating effects of external shocks such as digital technology iterations and policy changes. Fourth, incorporate cross-country data to compare differences in the relationship between digital transformation and corporate financialization across institutional environments, providing more universally applicable insights for the global real-sector enterprises' shift "from the virtual back to the real."

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Conflicts of Interest
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