

A Study on the Impact of Digital Transformation on Corporate Financialization: Empirical Evidence from China's A-Share Listed Companies (2012-2023)

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Abstract. Based on data from Chinese listed companies between 2012 and 2023, this paper empirically examines the impact of digital transformation on corporate financialization. The findings reveal that digital transformation significantly promotes corporate financialization, meaning it accelerates the shift of firms from real economic activities toward financial activities. Robustness tests, including variable replacement, alternative model estimations, and winsorizing the data, confirm that the results remain significant. Mechanism analysis indicates that digital transformation further drives corporate financialization by reducing operational costs and increasing risk-taking levels. Heterogeneity tests show that digital transformation has a significant positive effect on corporate financialization among firms in eastern and central regions, as well as those without major deficiencies. However, this effect is not significant for firms in western regions or those with major deficiencies.

Keywords: digital transformation, corporate financialization, corporate operational costs, corporate risk-taking level

1. Introduction

In recent years, China's economy has continued to advance under the policy guidance of "shifting from a virtual to a real economy." However, the tendency towards "financialization" among real-economy enterprises remains pronounced. On one hand, the high returns and short cycles characteristic of financial assets have led some firms to over-allocate resources to financial investments, crowding out funding for their main operations. This has resulted in the accumulation of risks associated with "using short-term loans for long-term investments" and maturity mismatch.

On the other hand, the wave of the digital economy is surging forward. Digital technologies such as cloud computing, big data, and artificial intelligence are reshaping corporate production functions, governance structures, and risk management models. Concurrently, policy support for digital transformation is unprecedented, with pilot initiatives like "Broadband China" and "Cloud Adoption, Data Utilization, and AI Empowerment" being rolled out, providing real-economy enterprises with digital infrastructure and institutional benefits.

Against this backdrop, exploring whether and how digital transformation affects corporate financialization is crucial. It concerns not only the resource allocation efficiency of individual firms

but also the substance and sustainability of the macroeconomy's "shift from virtual to real." This raises a series of research questions: First, what is the overall effect of digital transformation on corporate financialization – does it 'curb' or 'exacerbate' it? Second, through what mechanisms is this effect transmitted? Third, does the impact of digital transformation on corporate financialization exhibit heterogeneity across different regions and varying levels of corporate governance quality?

Addressing these questions is significant for several reasons. Theoretically, it helps respond to new topics in corporate governance research in the digital economy era and enriches the understanding of the applicability boundaries of relevant theories in digital contexts. Practically, for regulators, it can aid in identifying the "threshold" effects of digital transformation on financialization, informing the design of differentiated policies, and providing micro-level leverage for the coordinated implementation of the "Digital China" and "Financial Supply-Side Structural Reform" strategies. For enterprises, it can help clarify the governance benefits of digital investment, assisting them in balancing financial and real-economy investments and reducing maturity mismatch risks. For capital markets, it can provide signals to help investors distinguish between firms engaged in "pseudo-digitalization" and those genuinely "shifting from virtual to real."

The marginal contributions of this paper are twofold. On one hand, from a research perspective, it examines the impact of digital transformation on corporate financialization and further investigates the underlying mechanisms through the lenses of corporate operating costs and corporate risk-taking. On the other hand, based on the identified effects and mechanisms, it proposes concrete guidance and recommendations, offering practical references for relevant stakeholders.

2. Literature review

2.1. The impact of digital transformation on corporate financialization

Research generally indicates that digital transformation helps reduce the level of corporate financialization. Wang et al. [1], studying China's A-share manufacturing listed companies from 2007 to 2023, found that digital transformation can lower corporate financialization. It enhances total factor productivity by curbing excessive financial investments, with more pronounced effects in eastern regions and capital-intensive enterprises. Hu [2], from a banking perspective, pointed out that bank digital transformation can increase returns on physical investment and decrease returns on financial investment. It also reduces corporate financing constraints, thereby curbing corporate financialization, with varying effects across different corporate capital structures.

Further studies confirm this inhibitory effect across different sectors. Li and Dai [3] found that digital transformation significantly reduces the financialization level of agribusinesses and can alleviate managerial short-sightedness, with heterogeneity observed in factors like property rights nature. He et al. [4], focusing on non-financial listed companies, demonstrated that digital transformation weakens the precautionary motive by easing financing constraints and operational risks. It also weakens the profit-seeking motive by narrowing the return gap between financial and physical investments, thus curbing financial asset investment. This effect is more obvious in state-owned enterprises.

The mechanisms and contexts of this effect are explored in other research. Tao and Li [5], using manufacturing data, confirmed that digital transformation promotes a "shift from virtual to real" in manufacturing firms, primarily achieved by alleviating financing constraints, with a more significant role in competitive industries. Liu et al. [6], examining from the perspective of capital market information efficiency, found that the degree of digital transformation significantly suppresses the financial investment levels of real-sector enterprises by improving information symmetry, with

stronger effects in regions with high macro-control efficacy. Yang et al. [7], using data from Shanghai and Shenzhen A-share listed companies, found that digital transformation can curb corporate financial investment, with a more pronounced guiding effect on manufacturing and non-state-owned enterprises, functioning through promoting physical investments, among other channels.

Additional studies reinforce these findings. Zhao et al. [8], based on data from non-financial and non-real estate listed enterprises, showed that digital transformation promotes a "shift from virtual to real," driven by facilitating various corporate reforms, and is more significant in private enterprises. Xu and Wang [9], using data from real-economy listed companies, found that digital transformation has a significant governance effect on excessive financialization in these firms, achieved by promoting R&D investment, among other means, with better results in non-state-owned enterprises. Fang and Ju [10], utilizing Chinese listed company data and a fixed-effects model, discovered that digital transformation significantly reduces corporate financialization levels by enhancing information flow and operational capacity, with more evident effects under conditions of high competition and marketization levels.

2.2. The impact of digital transformation on corporate physical investment

Evidence suggests digital transformation encourages investment in the real economy. Gao and Qian [11], analyzing Chinese A-share listed company data with a panel data model, showed that corporate digital transformation significantly promotes fixed asset investment, primarily through channels like strengthening management efficiency. Sun [12], using A-share manufacturing listed companies as a sample and examining investment scale and structural bias, found that digital transformation shifts corporate investment bias from the financial sector towards the real sector. This shift exhibits a non-linear mediating effect and heterogeneity across different aspects.

The positive effect on real-economy investment is linked to risk reduction and financialization curbing. Zhou et al. [13], based on sample data from Chinese A-share listed companies, demonstrated that corporate digital transformation positively promotes industrial investment and can curb corporate financialization by reducing uncertainty expectations. The effect is more pronounced in large enterprises, among others. Zhang [14] found that digital transformation significantly promotes corporate investment in the real economy through mechanisms such as inhibiting corporate financialization, with a stronger effect observed in mature enterprises.

Studies also highlight specific mechanisms and contexts. He and Shen [15], based on Chinese listed company data, found that corporate digital transformation incentivizes fixed asset investment behavior, achieved by alleviating inhibitory pressures through means like improving internal control quality. Liu and Guo [16], utilizing databases and manually collected data, found that digitalization significantly increases the proportion of corporate operating assets, promoting a "shift from virtual to real" at the micro level, which is more significant in non-state-owned samples. Li et al. [17], through a theoretical framework, found that corporate digital transformation can significantly enhance the level of industrial investment, a "shift from real to virtual," achieved through paths like enhancing product competitiveness.

It is noteworthy that some research points to complex or indirect relationships. Yang et al. [18], using Chinese A-share listed company data, found that digital transformation promotes corporate financialization, but did not explicitly mention its impact on physical investment. However, viewed holistically, it relates to the impact of digital transformation on corporate economic behavior. Ha [19], through empirical research, indicated that digital technology positively impacts financial

development in multiple aspects. While not directly mentioning physical investment, it offers some insight into the connection between digital transformation and the economic sphere.

3. Research design

3.1. Model specification

To further examine the relationship between digital transformation and corporate financialization, this study establishes the following model:

$$Financialization_{it} = \alpha_0 + \beta_0 Digitalization_{it} + \sum \gamma_k Control_{it} + \lambda_t + \delta_i + \varepsilon_{it} \quad (1)$$

In this model: *Financialization* represents the degree of corporate financialization, *Digitalization* represents the degree of digital transformation, *Control* represents a set of control variables, λ_t represents the time-fixed effects, δ_i represents the firm-fixed effects, α_0 is the constant term, β_0 and γ_k are the coefficients for the variables.

3.2. Variable definitions

Regarding the explained variable, corporate financialization (Fin), this study uses the proportion of financial assets to total assets for measurement. Regarding the core explanatory variable, digital transformation (Dig), this study uses the frequency of relevant words in listed companies' annual reports for measurement. Specifically, based on the data pool formed by extracting text from listed companies' annual reports using Python, relevant characteristic words are searched, matched, and counted for frequency. Then, word frequencies are categorized and aggregated according to key technological directions to form a final total word frequency, thereby constructing an indicator system for corporate digital transformation. Regarding the mediating variables, corporate operating costs are measured using the enterprise cost-to-expense ratio, and corporate risk-taking level is measured by the volatility of the return on assets (ROA). Regarding the control variables, this study selects a series of control variables from both the corporate level and the macro level, specifically including: (1) Corporate-level variables: firm size, corporate profitability, corporate solvency, corporate liquidity level, firm age, board size, executive compensation, ownership concentration; (2) Macro-level variables: regional economic development level, regional industrial structure condition, regional financial development level.

3.3. Data sources and descriptive statistics

This study selects A-share listed companies from Shanghai and Shenzhen stock exchanges from 2012 to 2023 as the research sample. Regarding data sources, corporate digital transformation information was obtained from listed companies' annual reports, other firm-level data came from the CSMAR database, and macro-level data were sourced from the Wind database. The descriptive statistical results for all variables are detailed in Table 1.

Table 1. Descriptive statistics of variables

Variable Type	Variable Name	Variable Symbol	Observations	Mean Value	Std. Dev.	Minimum	Maximum
Explained Variable	Corporate Financialization	FinRatio	39740	0.054	0.096	0.000	0.725
Explanatory Variable	Digital Transformation	Digitalization	40573	1.565	1.434	0.000	6.380
Mediating Variable	Business Operating Cost	Cost	41619	0.706	0.188	-0.154	4.253
	Corporate Risk-Taking	Risk	40573	0.026	0.049	0.000	1.552
	Firm Size	Size	41628	3.097	0.060	2.704	3.357
	Profitability	ROA	41627	0.036	0.060	-0.163	0.171
	Leverage	Leverage	36173	1.288	0.738	0.630	4.947
	Liquidity	Liquidity	41591	0.693	2.010	-5.723	8.204
	Board Size	Board	30545	8.408	1.662	0.000	18.000
	Executive Compensation Ratio	Salary	30483	0.288	0.350	0.005	1.689
Control Variable	Firm Age	Age	41625	9.735	8.012	0.000	27.000
	Price-to-Earnings Ratio	PE	34853	72.049	100.902	6.843	550.452
	Ownership Concentration	Top5	41383	0.488	0.190	0.200	0.994
	Economic Development Level	GDP	41831	10.700	0.764	6.565	11.818
	Industrial Structure	Industry	41831	54.922	11.224	34.500	84.800
	Financial Development Level	Finance	41831	1.666	0.458	0.701	2.998

4. Empirical analysis

4.1. Basic regression analysis

The regression results are shown in Table 2. This indicates that digital transformation contributes to a higher level of corporate financialization. The reasons are as follows: On one hand, digital tools can help companies accurately identify idle funds and financial needs, thereby increasing the scale of financial asset holdings by improving the efficiency of financial resource allocation. On the other hand, digital technology can enhance a company's credit assessment capabilities and reduce information asymmetry, which strengthens the motivation for firms to participate in financial investments.

Table 2. Basic regression results

VARIABLES	(1)	(2)	(3)	(4)
	FinRatio	FinRatio	FinRatio	FinRatio
Digitalization	0.009*** (24.04)	0.009*** (20.01)	0.007*** (13.78)	0.004*** (7.70)
Size		0.092*** (6.82)	0.006 (0.32)	-0.072*** (-3.71)
ROA		-0.015 (-1.13)	0.056*** (3.51)	0.057*** (3.62)
Leverage		-0.002*** (-3.02)	-0.001 (-0.76)	0.000 (0.54)
Liquidity		0.001*** (3.38)	0.000** (2.13)	0.000 (1.50)
Board			-0.003***	-0.001***

Table 2. (continued)

			(-6.54)	(-3.22)
Salary			0.043***	0.036***
			(17.38)	(14.43)
Age			0.003***	0.002***
			(22.29)	(12.69)
PE			0.000**	0.000***
			(2.43)	(2.60)
Top5			0.018***	0.027***
			(4.59)	(6.66)
GDP				0.021***
				(14.14)
Industry				0.001***
				(5.91)
Finance				0.012***
				(4.94)
Constant	0.045***	-0.237***	-0.002	-0.042
	(31.83)	(-5.71)	(-0.04)	(-0.69)
Observations	38,619	33,564	24,902	24,897
Number of Firms	4,678	4,623	3,215	3,211

Note: z-statistics are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.2. Robustness analysis

First, this study used the proportion of profits from financial channels to replace the original explained variable. The regression results are shown in column (1) of Table 2, where the impact of digital transformation on corporate financialization remains significantly positive. Second, this study further employed random effects models and fixed effects models to re-estimate the data separately. The regression results are shown in columns (2) and (3) of Table 3, where the impact of digital transformation on corporate financialization remains significantly positive. Third, the winsorization range was expanded further by applying a 5% winsorization treatment to the data. After excluding extreme data values, the regression was performed again. The regression results are shown in column (4) of Table 2, where the impact of digital transformation on corporate financialization remains significantly positive.

Table 3. Robustness analysis

VARIABLES	(1)	(2)	(3)	(4)
	OLS	RE	FE	OLS
Digitalization	0.019*** (4.37)	0.004*** (7.70)	0.002*** (4.10)	0.003*** (7.55)
Size	0.197 (1.42)	-0.072*** (-3.71)	-0.179*** (-6.98)	-0.045*** (-2.72)
ROA	-0.896*** (-5.50)	0.057*** (3.62)	0.014 (0.82)	0.060*** (4.08)
Leverage	0.109*** (12.46)	0.000 (0.54)	0.001 (1.52)	-0.000 (-0.00)
Liquidity	-0.009*** (-3.16)	0.000 (1.50)	0.000 (0.42)	0.001*** (3.20)
Board	0.001 (0.30)	-0.001*** (-3.22)	-0.000 (-0.79)	-0.001*** (-3.24)
Salary	0.143*** (6.54)	0.036*** (14.43)	0.019*** (6.48)	0.029*** (11.93)
Age	0.010*** (11.38)	0.002*** (12.69)	0.005*** (10.55)	0.002*** (14.06)
PE	0.001*** (9.13)	0.000*** (2.60)	0.000** (2.14)	0.000*** (4.23)
Top5	0.058* (1.78)	0.027*** (6.66)	0.036*** (7.77)	0.023*** (7.29)
GDP	-0.027*** (-3.11)	0.021*** (14.14)	0.003 (0.56)	0.021*** (17.77)
Industry	0.002** (2.39)	0.001*** (5.91)	0.001*** (3.64)	0.000*** (4.41)
Finance	-0.055*** (-2.89)	0.012*** (4.94)	-0.007** (-2.22)	0.015*** (7.94)
Constant	-0.465 (-1.09)	-0.042 (-0.69)	0.468*** (5.06)	-0.120** (-2.37)
Observations	24,897	24,897	24,897	24,897
Number of Firms	3,211	3,211	3,211	3,211

Note: z-statistics are reported in parentheses, *** p<0.01, ** p<0.05, * p<0.1

4.3. Mechanism analysis

This study further investigates the mechanisms through which digital transformation affects corporate financialization, examining the perspectives of business operating costs and corporate risk-taking. The results are presented in Table 4. As shown, digital transformation contributes to higher corporate financialization through two main channels: first, by reducing business operating costs; and second, by enhancing corporate risk-taking capacity.

The underlying reasons can be explained as follows: From the cost perspective, the application of digital technologies like big data and artificial intelligence helps optimize production processes and internal operations. This significantly reduces operating costs and improves profit margins. However, with enhanced profitability, companies may allocate idle capital to financial assets,

seeking higher liquidity returns or short-term profit supplements. Particularly when core business growth slows down, financialization becomes a complementary approach for capital utilization, thereby elevating the level of corporate financialization.

From the risk perspective, digital technologies enable companies to better identify market trends and risk exposures, thereby strengthening their risk management capabilities. With improved risk tolerance, firms become more inclined to participate in high-risk, high-return financial activities to pursue excess returns. This tendency further drives up their level of financialization.

Table 4. Mechanism test results

VARIABLES	(1) Cost	(2) FinRatio	(3) Risk	(4) FinRatio
Cost		-0.034*** (-6.27)		
Risk				0.044*** (3.71)
Digitalization	-0.002*** (-3.82)	0.004*** (7.49)	0.002*** (9.34)	0.004*** (7.53)
Size	-0.345*** (-14.43)	-0.082*** (-4.18)	-0.029*** (-3.53)	-0.073*** (-3.75)
ROA	-1.073*** (-62.15)	0.019 (1.11)	0.104*** (12.54)	0.053*** (3.34)
Leverage	0.004*** (4.53)	0.001 (0.72)	0.005*** (10.63)	0.000 (0.28)
Liquidity	-0.002*** (-8.05)	0.000 (1.20)	-0.000 (-0.78)	0.000 (1.48)
Board	0.002*** (3.69)	-0.001*** (-3.09)	-0.001*** (-4.01)	-0.001*** (-3.17)
Salary	-0.119*** (-41.63)	0.032*** (12.08)	0.001 (1.12)	0.036*** (14.41)
Age	0.002*** (10.65)	0.002*** (13.08)	0.001*** (9.53)	0.002*** (12.56)
PE	-0.000 (-0.44)	0.000** (2.54)	0.000 (1.61)	0.000*** (2.60)
Top5	0.036*** (7.81)	0.028*** (6.99)	-0.016*** (-8.61)	0.027*** (6.80)
GDP	0.012*** (5.37)	0.021*** (14.53)	0.000 (0.92)	0.021*** (14.06)
Industry	-0.002*** (-12.43)	0.001*** (5.39)	0.001*** (10.77)	0.001*** (5.60)
Finance	0.016*** (5.53)	0.012*** (5.17)	-0.013*** (-12.11)	0.013*** (5.28)
Observations	19,167	3,204	2,432	156
Number of Firms	2,528	402	305	129

Note: z-statistics are reported in parentheses, *** p<0.01, ** p<0.05, * p<0.1

4.4. Heterogeneity analysis

This study examines the heterogeneous effects of digital transformation on corporate financialization from the perspectives of corporate location and corporate governance quality. For enterprises located in eastern and central regions and those without major deficiencies, digital transformation demonstrates a significant positive impact on corporate financialization development. However, for enterprises in western regions and those with major deficiencies, this impact is not significant. From a regional perspective, the western region's weak digital infrastructure constraints the pace of corporate digital transformation, making it difficult to effectively leverage technological empowerment. From the corporate governance quality perspective, enterprises with major deficiencies cannot effectively integrate digital technology with financial strategy due to internal governance failures or resource constraints, resulting in an insignificant positive impact of digitalization on financialization.

Table 5. Heterogeneity analysis

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Eastern	Central	Western	With major deficiencies	Without major deficiencies
Digitalization	0.004*** (6.38)	0.003** (2.34)	0.001 (0.61)	0.008 (1.37)	0.004*** (7.78)
Size	-0.081*** (-3.44)	-0.095** (-2.11)	-0.140*** (-2.85)	-0.244 (-1.36)	-0.070*** (-3.60)
ROA	0.042** (2.22)	0.223*** (6.18)	0.010 (0.25)	-0.065 (-0.25)	0.060*** (3.82)
Leverage	-0.001 (-0.69)	0.003* (1.89)	0.003* (1.66)	-0.003 (-0.28)	0.000 (0.60)
Liquidity	0.000 (0.88)	0.000 (0.24)	0.001* (1.92)	-0.003 (-0.99)	0.000 (1.50)
Board	-0.002*** (-3.05)	-0.001 (-1.52)	0.001 (1.00)	0.002 (0.49)	-0.001*** (-3.37)
Salary	0.039*** (13.37)	0.034*** (5.30)	0.003 (0.39)	0.047 (1.56)	0.037*** (14.52)
Age	0.002*** (9.51)	0.001** (2.30)	0.001* (1.86)	0.002** (2.20)	0.002*** (12.63)
PE	0.000** (2.21)	0.000** (2.02)	0.000 (0.25)	-0.000 (-0.12)	0.000** (2.57)
Top5	0.036*** (7.60)	-0.001 (-0.08)	0.002 (0.21)	0.048 (1.13)	0.027*** (6.74)
GDP	0.028*** (13.73)	0.034*** (7.22)	0.022*** (4.76)	0.007 (0.90)	0.021*** (14.08)
Industry	0.001*** (7.09)	-0.000 (-1.18)	0.001*** (3.12)	0.002 (1.42)	0.001*** (5.88)
Finance	0.010*** (3.55)	0.032*** (4.24)	0.009 (1.08)	-0.014 (-0.57)	0.012*** (4.94)
Constant	-0.107 (-1.48)	-0.059 (-0.43)	0.161 (1.07)	0.582 (1.05)	-0.047 (-0.79)
Observations	19,167	3,204	2,432	156	24,741
Number of Firms	2,528	402	305	129	3,211

Note: z-statistics are reported in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5. Conclusions and recommendations

The findings reveal that digital transformation significantly promotes corporate financialization, thereby contributing to a "shift from real to virtual" within firms. In other words, digital tools and technologies strengthen corporate motivation to engage in financial investments and increase their holdings of financial assets. This result remains significant after a series of robustness tests, including variable substitution, model re-estimation, and data winsorization. Mechanism tests indicate that digital transformation further drives corporate financialization by reducing business operating costs and increasing risk-taking capacity. Heterogeneity tests show that digital transformation significantly promotes financialization in enterprises located in eastern and central regions and those without major deficiencies, while this effect is not significant for firms in western regions or those with major deficiencies.

Based on these findings, this study proposes the following recommendations:

First, guide enterprises to utilize digital tools and technologies rationally. Governments and relevant institutions should strengthen guidance for corporate digital transformation, ensuring that digital tools and technologies are primarily used to enhance the efficiency and competitiveness of core business operations, rather than merely increasing financial investments. Companies should focus their digital transformation efforts on optimizing production processes and improving management efficiency, avoiding excessive financialization that leads to a "shift from real to virtual."

Second, strengthen supervision over corporate financial investment behaviors. Regulatory authorities should improve financial supervision policies to prevent companies from neglecting the healthy development of their core businesses due to excessive pursuit of financial investment returns, thereby ensuring the rational allocation and use of corporate funds. Meanwhile, enterprises should enhance prudent management of financial investments to ensure that investment activities align with their long-term development strategies.

Third, focus on improving corporate governance structures and promoting digital transformation among enterprises in western regions. For companies with major deficiencies, priority should be given to improving their corporate governance structures to ensure scientific and transparent decision-making. For enterprises in western regions, more policy support and resource allocation should be provided to help them benefit from digital transformation, rather than simply increasing financial investments.

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