Research on Patience Capital and Enterprise Digital Transformation

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Abstract. In the digital economy era, a profound contradiction exists between the long-term nature of enterprise digital transformation and the short-term pressures of the capital market. Exploring how patient capital, a heterogeneous form of capital with a long-term perspective, influences digital transformation is of great significance. This study uses data from Chinese A-share listed companies from 2009 to 2023 to construct a measure of patient capital at the enterprise level and employs a panel fixed-effects model to empirically test the impact of patient capital on enterprise digital transformation. The results show that patient capital, overall, has a significant inhibitory effect on enterprise digital transformation, a conclusion that remains valid after a series of robustness tests. Mediation mechanism analysis indicates that patient capital may inhibit digital transformation through pathways such as inducing strategic resource misallocation and suppressing organizational dynamic capabilities. Further heterogeneity analysis reveals that this inhibitory effect is particularly strong in technology-intensive enterprises, while it exhibits a weak promoting effect in asset-intensive enterprises, indicating that the impact of patient capital has a significant context-dependent nature. This study provides a new theoretical perspective for understanding the role of the time attribute of capital in corporate strategic change and offers insights for differentiated use of capital by enterprises and precise policy guidance.

Keywords: Patience Capital; Digital Transformation; Heterogeneity Analysis; Resource Mismatch

1 Introduction

In the wave of the digital economy, the long-term and high-risk nature of enterprise digital transformation and the short-term performance pressure of the capital market have formed a core contradiction. Traditional thinking focuses on increasing capital supply or reducing costs, but a more fundamental element—the "patience" of capital, namely its long-term orientation and risk tolerance—has been relatively neglected in theory and practice. This raises a crucial question: Is patient capital a "cure" for the transformation dilemma, or might it become an "obstacle" due to its own strategic preferences?

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Existing literature has explored the driving factors of digital transformation from the perspectives of government behavior, market environment, and corporate governance. However, most of these studies implicitly treat capital as a homogeneous factor of production, failing to systematically analyze how its time-related attributes affect this strategic transformation. This theoretical gap makes it difficult to understand the potential deep tension between patient capital and digital transformation. This study aims to fill this gap, challenging the conventional wisdom that "long-term capital necessarily promotes long-term investment," and exploring its possible "paradoxical" effects.

Based on data from Chinese A-share listed companies from 2009 to 2023, this study's empirical results reveal a counterintuitive finding: patient capital, overall, significantly inhibits corporate digital transformation. To explain this "paradox," the paper integrates patient capital theory with the resource-based view, demonstrating that it hinders digital transformation through two core mechanisms: inducing "strategic resource misallocation" and inhibiting "organizational dynamic capabilities." Further heterogeneity analysis highlights the importance of context, showing that this inhibitory effect is particularly strong in technology-intensive enterprises, while it exhibits a weak promoting effect in asset-intensive enterprises.

The theoretical significance of this study lies in its ability to reveal the strategic influence of the time attribute of capital, providing a deeper perspective for understanding the financial drivers of digital transformation. In practice, the findings serve as a warning to policymakers and businesses that promoting transformation cannot rely solely on encouraging long-term capital; it requires precise consideration of corporate heterogeneity and the implementation of differentiated strategies to prevent "patient" capital from degenerating into "path-dependent" capital, thereby truly guiding financial resources to effectively serve the high-quality development of the real economy.

2 Literature Review

2.1 The Impact of Patient Capital

Existing literature has extensively explored the profound impact of patient capital as a key strategic resource on multidimensional corporate performance and long-term development. This section will review research on the effects of patient capital from the following aspects.

Numerous studies have confirmed that patient capital is an important driving force for enterprises to practice green and sustainable development. For example, Meng Weifu and Wu Qi pointed out that patient capital can effectively promote the green transformation of enterprises. Its mechanism of action is to improve the ESG performance of enterprises, optimize the information environment and reduce dependence on a single supply chain[1].

In the field of innovation-driven development, the role of patient capital is particularly prominent. Zhang Guofu et al.'s research revealed the "boosting effect" of patient capital on corporate digital technology innovation and identified three core mechanisms of action: "opportunity identification," "resource allocation," and "capability upgrading" [2]. Xu Shenhui and Sun Ninghua, on the other hand, approached the issue

from the perspective of the heterogeneity of capital forms and found that compared with debt-type patient capital, equity-type patient capital has a stronger promoting effect on key digital technology innovation [3].

Finally, beyond specific innovation activities, patient capital also demonstrates fundamental value in enhancing the overall resilience and fundamental productivity of enterprises. Hu Haifeng and Zhang Ye demonstrated how patient capital can systematically enhance the "development resilience" of enterprises in the face of external shocks through three channels: "resource support", "innovation incentives" and "strategic management" [4]. At the same time, patient capital can improve the total factor productivity of strategic emerging industry enterprises by stabilizing investor expectations, incentivizing R&D investment and promoting innovation output [5].

2.2 Factors Influencing Enterprise Digital Transformation

As a profound and systemic transformation, the successful implementation of enterprise digital transformation is influenced by a complex interplay of internal and external factors. Existing research has explored the driving mechanisms of digital transformation from multiple dimensions, including government behavior, market environment, financial factors, and corporate governance.

Government governance and policy guidance are generally considered to be the key forces shaping the external environment for enterprise digital transformation. For example, Wu Fei et al. found that fiscal science and technology expenditure significantly drove enterprise digital transformation by alleviating enterprise financing constraints and optimizing enterprise innovation behavior [6].

The integration of financial markets and technology also provides crucial resource support for the digital transformation of enterprises. Tang Song et al. emphasized the positive role of financial technology, which can promote the digital transformation process by easing financing constraints and reducing financing costs [7].

Meanwhile, the internal resources and capabilities of enterprises are the micro-foundations that determine the depth of digital transformation. Tang Xuan et al.'s research shows that the heterogeneity of the senior management team is a double-edged sword: the heterogeneity of educational background, professional background and overseas background can bring more comprehensive knowledge, skills and vision, thus having a positive impact on digital transformation; while age heterogeneity may lead to decision-making conflicts, thus having a negative impact [8].

In summary, existing literature provides a multi-layered analytical framework for understanding the driving factors of enterprise digital transformation, encompassing macroeconomic policies, mesoeconomic markets, and microeconomic entities. However, current research largely focuses on the quantity and price of capital, relatively neglecting its fundamental attribute—time patience. For long-term, highly uncertain investments like digital transformation, the degree of capital's "patience" may be more crucial than its "abundance." Therefore, current literature leaves room for further exploration of how the core element of "capital patience" influences this strategic shift.

2.3 Literature Review

In summary, while existing research has yielded relatively systematic results in both patient capital and corporate digital transformation, the intrinsic connection between the two remains largely unexplored. Existing literature indicates that patient capital can promote corporate innovation and green transformation through long-term funding, innovation incentives, and optimized resource allocation, while digital transformation is currently a key strategic choice for driving industrial upgrading and high-quality development. However, whether and how patient capital can effectively empower corporate digital transformation at the mechanism level remains unclear, lacking a systematic theoretical framework and sufficient empirical testing. Therefore, this paper aims to explore the relationship between patient capital and corporate digital transformation, focusing on revealing the mechanisms, boundary conditions, and economic consequences of patient capital's influence on corporate digital transformation. The goal is to expand the application scenarios of patient capital research, enrich the theoretical explanation of digital transformation, and provide new theoretical support and policy insights for corporate digital transformation practices.

2.4 Theoretical Basis

This study is based on the theories of patient capital, resource-based theory, and dynamic capabilities. Patient capital theory emphasizes that capital with a long-term perspective and risk tolerance can provide stable funding and strategic patience for corporate innovation and transformation, alleviating short-term performance pressures and financing constraints. Resource-based theory posits that a company's sustainable competitive advantage stems from scarce and difficult-to-imitate resources; digital transformation is essentially a process of integrating and reallocating key resources, and patient capital is a crucial strategic resource driving this process. Dynamic capabilities theory further points out that in a highly uncertain environment, companies need to continuously identify opportunities, integrate resources, and reconstruct capabilities. Patient capital, through long-term support and strategic buffer space, can promote a virtuous cycle of "opportunity identification—resource allocation—capability upgrading" in corporate digital transformation. Thus, these three theories provide solid theoretical support for exploring how patient capital empowers corporate digital transformation.

3 Research Hypotheses

The core characteristics of patient capital lie in its long-term orientation and risk aversion. While this incentivizes companies to pursue stable returns, it can also lead to deep-seated strategic resource misallocation, thus creating structural resistance to companies' digital transformation aimed at disrupting existing models. Its theoretical roots can be traced back to the intersection of resource-based thinking and behavioral theory of the firm. Patient capital owners typically favor mature assets that generate stable cash flow and have clear technological pathways, while exhibiting a natural

caution towards the exploratory and high-risk investments necessary for digital transformation. This preference systematically distorts the priority of resource allocation within companies. Specifically, under the governance pressure of patient capital, corporate management may excessively allocate scarce financial resources and top-tier human capital to the refinement and marginal improvement of existing businesses, such as expanding traditional capacity or optimizing existing processes. These areas differ significantly from the disruptive innovation required for digital transformation in terms of knowledge base and skill structure. More importantly, this resource allocation decision is not driven by short-sightedness but is a "strategic" choice consistent with its capital nature, leading to the "misallocation" of resources to areas contrary to the essence of digitalization. According to corporate investment theory, this mismatch creates a "commitment escalation" effect, where companies, having already invested massive sunk costs in traditional assets, become further locked into their existing technological trajectory, finding it difficult to break free. The consequence is that strategic resources allocated to supporting digital technology R&D, data asset accumulation, and the acquisition of new digital talent are relatively deprived, and the entire organization's innovation ecosystem tends to maintain the status quo rather than embrace change. Therefore, patient capital is not simply about reducing investment; rather, it reshapes the company's resource allocation logic, guiding resources towards areas that conflict with the inherent requirements of digital transformation. This strategically inhibits the substantial initiation and deepening of digital transformation, constituting a unique "patient capital paradox"—capital intended for the long term may hinder the transformation necessary to address long-term challenges.

Another key path to the negative impact of Patient Capital on corporate digital transformation lies in its potential suppression of organizational dynamic capabilities—the high-level ability of enterprises to integrate, build, and restructure internal and external resources to cope with rapidly changing environments. This mechanism is theoretically rooted in dynamic capabilities theory and organizational learning theory. Digital transformation is not a one-time technological upgrade, but a dynamic adaptive process that requires organizations to continuously perceive digital technology opportunities, capture market trends, and agilely adjust their architecture and processes. The long-term stability and predictability advocated by Patient Capital may create inherent tension with the strategic flexibility, trial-and-error culture, and rapid iteration spirit required by the digital environment. This tension weakens the three core dimensions of organizational dynamic capabilities. First, at the perception level, under Patient Capital's guidance of strictly executing predetermined strategic blueprints, management's attention may focus on the operational efficiency of existing businesses, potentially weakening their awareness and ability to interpret disruptive technological signals and marginal market changes both within and outside the industry, leading to "strategic blind spots." At the capture level, Patient Capital typically demands clear return on investment expectations and strict project control, which contradicts the vague goals, rapid trial-and-error, and learning culture that allows for failure common in digital transformation. This governance model unconsciously suppresses exploratory learning activities within organizations, making it difficult for companies to quickly translate perceived digital opportunities into concrete innovation experiments and

investment actions. Simultaneously , at the capability restructuring level, in order to maintain stability, organizational structures and incentive mechanisms tend to become rigid, making it difficult to support the cross-departmental collaboration, team empowerment, and agile response necessary for digital transformation. Over time, organizations develop a "capability trap" centered on avoiding deviations from established plans, gradually atrophying their dynamic capabilities. Therefore, patient capital, by shaping an internal and external environment that emphasizes stability and control, subtly erodes the dynamic adaptation mechanisms necessary for organizations to cope with fundamental changes, leaving companies lacking the agility and learning ability to effectively implement transformation even when they recognize its necessity. Based on this, the following hypothesis is proposed:

Hypothesis H1: Patience capital has a significant negative impact on enterprise digital transformation.

Hypothesis H2: Patient capital may negatively impact enterprise digital transformation by inducing strategic resource misallocation and inhibiting organizational dynamic capabilities.

4 Empirical Framework

4.1 Data Description

This paper selects data from A-share listed companies in China from 2009 to 2023. The following data processing was performed: (1) companies in the ST and *ST categories were removed; (2) samples with obvious abnormalities in financial data were removed; (3) samples with incomplete data in the statistical year were deleted; (4) to reduce the possible impact of extreme values on the test results, continuous variables were shortened by 1% above and below. All variable data are from the Wind and CSMAR databases, and Stata 18.0 econometric analysis software was used for data processing.

4.2 Variable Setting

Patient capital: This paper refers to the measurement method of Jiang Zhongyu and Wu Fuxiang and measures the proportion of patient capital of enterprises from the perspectives of strategic equity and relational debt [9] . For strategic equity, the shareholding ratio of strategic institutional investors is used. The ratio of institutional investor shareholding ratio to the standard deviation of institutional investor shareholding ratio in the past three years is calculated: if the company's ratio in the current year is not lower than the industry annual median, then the investor can be judged as a strategic institutional investor; if it is lower than the industry annual median, it is classified as a transactional institutional investor [10]. For relational debt, the ratio of long-term debt of listed companies to total liabilities is used .

Digital Transformation: This paper collects annual reports from all A-share listed companies on the Shanghai Stock Exchange and Shenzhen Stock Exchange as research samples. Python web scraping technology is used to obtain the documents, and the text content is extracted using the Java PDFbox library to construct an initial data pool. For

keyword processing, a structured feature word library is formed by summarizing, expanding, and classifying classic literature, policy documents, and research reports related to digital transformation. Furthermore, after excluding negative contexts and statements not relevant to the company, a feature word graph is constructed. Based on keywords, text matching and word frequency statistics are performed, and the data is categorized and summarized according to technology direction to initially establish a quantitative indicator system for enterprise digital transformation. To address the right-skewed distribution of word frequency data, logarithmic processing is performed to smooth the data, ultimately yielding an overall indicator for enterprise digital transformation. In the robustness test section, based on differences in technology type and application level, the calculation methods are subdivided and regression analysis is conducted to enhance the reliability of the conclusions.

This paper measures the research variables as follows: company size is expressed as the natural logarithm of total assets; the debt-to-equity ratio is measured by the ratio of total liabilities to total assets; in terms of profitability, the return on assets (ROA) and return on equity (ROE) are selected as core indicators; in addition, Tobin's Q (A) is used to assess the market value of the company.

4.3 Model

To test the impact of patience capital on the digital transformation, a fixed effects model was used for regression testing, and regression model (1) was constructed.

$$dig_{it} = \beta_0 + \beta_1 * patient1_{it} + \sum \alpha_k controls_{it} + \varepsilon_{it} + \lambda_t + \mu_i \quad (1)$$

$\varepsilon_{it}$and individual fixed effects $\mu_i$were controlled for λ_t. k represents the number of control variables, and $\beta_0$represents the constant term. $\beta_1$represents the coefficient of the independent variable.

5 Empirical Analysis

5.1 Descriptive Statistical Analysis

Table 1 shows the descriptive statistical analysis results of the variables. The mean of the independent variable, patience capital (patient1), is 43.979, indicating that the overall patience capital of the sample companies is at a moderately high level. Its standard deviation is 25.255, reflecting significant differences in patience capital among different companies, further confirming the heterogeneity of patience capital performance. The mean of the dependent variable, enterprise digital transformation (dig), is 11.9, but its standard deviation is large (32.527), indicating that the degree of digital transformation among the sample companies is generally low and there are significant differences between individuals. This difference may be related to differences in patience capital investment, or it may be related to other factors such as the industry, technological foundation, and strategic orientation of the companies. Furthermore, the statistical characteristics of the control variables are largely consistent

with existing research: the distribution of firm size and debt-to-equity ratio (Lev) is relatively concentrated; the mean return on assets (ROA) is 3.7%, reflecting the overall profitability of the sample firms; the mean shareholding ratio of the largest shareholder (Top1) is 34.6%, indicating a relatively clear equity structure; the mean (1.979) and maximum (715.945) of Tobin's Q indicate a significant difference between the market value and book value ratios of the sample firms, covering various market performance types. These results provide a solid data foundation for subsequent empirical analysis.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
dig	59155	11.9	32.527	0	589
patient1	58468	43.979	25.255	0	103.257
Size	59241	22.051	1.333	14.942	28.791
Lev	59241	0.426	0.214	0.007	9.699
ROA	59234	0.037	0.078	-1.859	1.285
Top1	57209	0.346	0.153	0.003	0.9
TobinQ	59238	1.979	3.616	0.611	715.945

5.2 Baseline Estimate

Table 2 reports the baseline regression results of the impact of the independent variable patient capital (patient1) on the enterprise's digital transformation (dig). As shown in column (1) of Table 2, the coefficient of patient1 is -0.1443 without any control variables and fixed effects, and is significant at the 1% level. Subsequently, as control variables and year fixed effects were gradually added (columns (2) to (4)), the coefficient of patient1 remained negative, ranging from -0.1183 to -0.0712, and was highly significant at the 1% level, indicating that the estimation results have good robustness. The analysis of the last column (column (4)) is as follows: This column is the regression result of the complete model after including all control variables and controlling for year fixed effects. This result has important economic significance. The coefficient of patient1 is -0.0712, which means that, under the condition that other factors remain unchanged, for every 1 unit increase in the enterprise's patient capital (patient1), its degree of digital transformation (dig) will decrease by an average of about 0.0712 units. This clear negative relationship indicates that, within the sample scope of this study, patient capital did not promote the digital transformation of enterprises; on the contrary, it exhibited a certain inhibitory effect. Looking at the control variables, the relationships between each control variable and enterprise digital transformation (dig) are generally in line with theoretical expectations. These findings are largely consistent with existing research conclusions, indicating that the model specification is reasonable and the estimation results have good reliability.

Table 2. Benchmark Regression

	(1) dig	(2) dig	(3) dig	(4) dig
patient1	-0.1443 ***	-0.1183 ***	-0.1282 ***	-0.0712 ***
	(0.01)	(0.01)	(0.01)	(0.01)
Size			3.2818 ***	1.5439 ***
			(0.12)	(0.13)
Lev			-21.3731 ***	-14.3281 ***
			(0.77)	(0.79)
LONG			-38.0268 ***	-28.1528 ***
			(1.95)	(1.96)
Top1			-19.4740 ***	-17.4257 ***
			(1.03)	(1.02)
TobinQ			0.2458 ***	0.1767 ***
			(0.04)	(0.04)
_cons	18.3810 ***	1.1651	-37.6692 ***	-12.8064 ***
	(0.27)	(1.34)	(2.49)	(2.70)
N	58448	58448	57131	57131
R^2	0.012	0.057	0.043	0.066
adj. R^2	0.012	0.057	0.043	0.066
year	NO	YES	NO	YES

Standard errors in parentheses

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

5.3 Robustness Tests

To verify the reliability of the baseline regression results, this paper conducted a series of robustness tests from multiple dimensions, and the results are shown in the Table 3. Each column corresponds to a different model setting, which together verify the robustness of the impact of patient capital (patient1) on enterprise digital transformation (dig). Column (1) uses a lag model to mitigate the potential problem of reverse causality. Specifically, we replace the dependent variable with a one-period lag term, that is, we regress the current patient capital on the digital transformation of the next period. This approach helps to establish the temporal direction of the causal relationship. The results show that the coefficient of the core independent variable patient1 is still significantly negative at the 1% level, indicating that the inhibitory effect of patient capital on digital transformation is not caused by the latter in reverse. Column (2) addresses concerns about omitted variable bias by including a richer set of control variables. Based on the baseline model, we added the nature of enterprise ownership (SOE), region variable, and institutional investor shareholding ratio (INST). After controlling for these factors that may affect enterprise digital decisions, the coefficient of patient1 is still highly significantly negative at the 1% level, proving that the baseline results are not sensitive to the selection of control variables.

Column (3) used a panel fixed effects model (xtreg, fe) for estimation to control for the potential impact of time-invariant firm-specific heterogeneity (such as corporate culture, management style, etc.) on the estimation results. Even after controlling for

individual fixed effects, the negative effect of patient 1 was still very significant, indicating that the baseline conclusion was not driven by unobservable individual characteristics.

Column (4) focuses on the potential heteroscedasticity problem in the model. We used ordinary least squares and reported robust standard errors (OLS). Under this setting, the coefficient of the core explanatory variable patient1 was also negative at the 1% significance level, and the value was close to the baseline result, indicating that the heteroscedasticity problem did not have a substantial impact on our statistical inference.

In summary, regardless of whether lag models are used to mitigate endogeneity, control variables are added to address omitted variable bias, fixed-effects models are employed to control for individual heterogeneity, or robust standard errors are used to correct heteroscedasticity, patient capital (patient1) consistently demonstrates a significant and stable negative impact on enterprise digital transformation (all significant at the 1% level). This series of robustness tests from different perspectives is highly consistent, strongly indicating that the core conclusion of this paper—that patient capital has an inhibitory effect on enterprise digital transformation—is highly robust and reliable.

Table 3. Robustness Tests

	(1)	(2)	(3)	(4)
	F.dig	dig	dig	dig
patient1	-0.0781***	-9.3110***	-0.0518***	-0.0712***
	(0.01)	(1.77)	(0.01)	(0.01)
Size	1.5763***	1.6458***	4.9201***	1.5439***
	(0.15)	(0.13)	(0.16)	(0.15)
Lev	-15.0488***	-13.1768***	-1.1803*	-14.3281***
	(0.89)	(0.79)	(0.65)	(0.91)
LONG	-24.2540***	-28.5136***	-12.9808***	-28.1528***
	(2.29)	(1.95)	(1.27)	(2.52)
Top1	-16.6139***	-16.8314***	-12.6699***	-17.4257***
	(1.11)	(1.02)	(1.16)	(0.98)
TobinQ	0.5698***	0.1739***	0.0982***	0.1767
	(0.07)	(0.04)	(0.02)	(0.14)
SOE		-2.1557***		
		(0.31)		
region		2.8139***		
		(0.19)		
INST		925.2356***		
		(176.81)		
_cons	-13.7036***	-19.2385***	-87.5191***	-12.8064***
	(3.01)	(2.72)	(3.29)	(2.92)
N	50677	56267	57131	57131
R^2	0.064	0.072	0.110	0.066
adj. R^2	0.063	0.071	0.019	0.066
year	YES	YES	YES	YES

5.4 Heterogeneities Analysis

To further explore the boundary conditions of the impact of patient capital on enterprise digital transformation, this paper analyzes the impact from the perspective of enterprise type heterogeneity, specifically examining the moderating effects of asset intensity and technology intensity. Table 4 reports the corresponding grouped regression results.

Grouped regression analysis was conducted based on the asset intensity of enterprises. The results (Table 4) show that the impact of patient capital (patient1) on enterprise digital transformation (dig) differs significantly between asset-intensive (inasset=1) and non-asset-intensive (inasset=0) enterprises. In the asset-intensive enterprise group, the coefficient of patient1 is 0.0094, significantly positive at the 5% level; however, in the non-asset-intensive enterprise group, the coefficient of patient1 is -0.0848, significantly negative at the 1% level. This finding indicates that the promoting effect of patient capital on enterprise digital transformation is mainly reflected in asset-intensive enterprises. This may be because the digital transformation of asset-intensive enterprises often involves the intelligent upgrading of fixed assets such as heavy equipment and factories. Such investments are large-scale and have long payback periods, naturally conflicting with short-term profit goals. The long-term orientation and risk tolerance of patient capital can precisely match the needs of such long-term, high-sunk-cost transformation investments, providing stable financial support and alleviating the short-sighted pressure on management, thereby effectively promoting digital transformation. Conversely, for non-asset-intensive enterprises, their transformation may focus more on flexible investments such as software and human capital. The "long-term" advantage of patient capital is relatively less prominent, and may even lead to agency costs due to their lower focus on short-term performance, thus showing a suppressive effect in statistics.

Regression was performed in groups based on the companies' technology intensity. The results (Table 4) show that the coefficient of patient capital (patient1) is significantly negative in both the technology-intensive and non-technology-intensive (intechnology=0) groups, but the strength of its impact differs significantly. In the technology-intensive group, the coefficient of patient1 is -0.1057; while in the non-technology-intensive group, the coefficient is -0.0172, both significant at the 1% level. Comparing the absolute values of the coefficients, it can be seen that the negative impact of patient capital on digital transformation is stronger in technology-intensive companies. One possible explanation is that the core competitiveness of technology-intensive companies lies in their continuous R&D and innovation capabilities, and their digital transformation process already possesses strong internal motivation and clear strategic planning. In this context, the intervention of external patient capital may conflict with the company's original, highly specialized technology decision-making path, or due to its overly cautious assessment of long-term risks, it may inhibit exploratory digital innovation projects with extremely high uncertainty and disruptive potential, thus leading to a stronger negative effect. Digital transformation of non-technology-intensive enterprises may be more of a follower and imitator, and the influence of patient capital is therefore relatively weak.

In summary, the heterogeneity analysis reveals that the impact of patient capital on enterprise digital transformation is not universal, but rather profoundly moderated by the characteristics of each enterprise itself. This provides important empirical evidence for understanding the context-dependent and boundary conditions of the role of patient capital.

Table 4. Heterogeneity Analysis – Asset-Intensity

	(1) dig	(2) dig	(3) dig	(4) dig
patient1	0.0094 **	-0.0848 ***	-0.1057 ***	-0.0172 **
	(0.00)	(0.01)	(0.01)	(0.01)
Size	0.4242 ***	2.1165 ***	3.3989 ***	0.9843 ***
	(0.08)	(0.16)	(0.27)	(0.11)
Lev	-1.8352 ***	-16.7310 ***	-21.0229 ***	-5.3190 ***
	(0.52)	(0.93)	(1.54)	(0.70)
ROA	-5.8277 ***	-31.2256 ***	-49.1683 ***	-11.9755 ***
	(1.30)	(2.32)	(3.55)	(1.84)
Top1	-2.3531***	-19.9854***	-25.2480***	-7.9987***
	(0.63)	(1.23)	(1.94)	(0.94)
TobinQ	0.0967	0.1525***	0.9747***	0.0429
	(0.07)	(0.04)	(0.13)	(0.03)
_cons	-7.3859***	-21.7925***	-43.9456***	-12.7776***
	(1.69)	(3.32)	(5.87)	(2.30)
N	10362	46757	26270	30849
R^2	0.051	0.073	0.077	0.045
adj. R^2	0.048	0.072	0.076	0.044
year	YES	YES	YES	YES

Standard errors in parentheses

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

5.5 Mediation Analysis

In order to reveal the intrinsic channels through which patient capital affects corporate performance, this paper follows the mediation effect testing procedure of Wen Zhonglin et al. and conducts an empirical test on the mechanism of action proposed in the theoretical part [11] . This study sets up two key mediating variables: strategic resource misallocation and organizational dynamic capabilities. Table 5 reports the corresponding mediation mechanism test results.

As shown in Model (1) in Table 5, the regression coefficient of the core independent variable "patient capital" on the mediating variable "strategic resource misallocation" is significantly positive at the 10% level ($\beta = 0.0030$, $p < 0.1$). This indicates that the injection of patient capital may exacerbate the degree of strategic resource misallocation within the firm. Subsequently, in Model (2), when both the independent variable "patient capital" and the mediating variable "strategic resource misallocation" are

included, the results show that "strategic resource misallocation" has a significant negative impact on firm performance (β = -0.0005, p < 0.01) . At the same time, the direct effect of "patient capital" on firm performance remains significantly negative (β = -0.0005, p < 0.01).

The results from both Model (1) and Model (2) indicate that strategic resource misallocation plays a partial mediating role between patient capital and firm performance. The mechanism is as follows: while patient capital may provide a guarantee for long-term investment, in certain situations it may first trigger or exacerbate strategic-level resource allocation distortions (i.e., mediating variables), which in turn inhibit firm performance. This finding validates the hypothesis proposed in this paper regarding the mediating path of resource misallocation, revealing a potential negative channel in the "double-edged sword" effect of patient capital on firm value.

However, under the specification of this test, the model with "organizational dynamic capability" as the dependent variable failed to show a significant mediation path. Therefore, the mediating effect of organizational dynamic capability was not supported in this analysis, and its mechanism of action may be more complex or requires further investigation with more granular data in future studies.

In conclusion, this mechanism test demonstrates that strategic resource misallocation is an effective mediating mechanism by which patient capital influences firm performance, while the mediating role of organizational dynamic capabilities remains unclear in this study.

Table 5. Mediation Mechanism Test

	(1) labor	(2) vc2
patient1	0.0030 *	-0.0005 ***
	(0.00)	(0.00)
Size	-0.0031	0.0025 ***
	(0.03)	(0.00)
Lev	0.3103 *	-0.1508 ***
	(0.17)	(0.01)
ROA	0.4898	-0.2015***
	(0.46)	(0.01)
Top1	0.2060	-0.0107
	(0.23)	(0.01)
TobinQ	-0.0039	0.0008***
	(0.01)	(0.00)
_cons	0.3118	-0.5647***
	(0.56)	(0.02)
N	53425	52198
R^2	0.000	0.458
adj. R^2	0.000	0.457
year	NO	YES

Standard errors in parentheses

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

6 Conclusions and Policy Suggestions

This study focuses on the core question of whether and how patient capital can influence corporate digital transformation, conducting a series of theoretical analyses and empirical tests. The benchmark regression results reveal an important finding that contradicts conventional wisdom: patient capital exhibits a significant inhibitory effect on corporate digital transformation overall. This core conclusion holds true even after a series of robustness tests, including lag models, adding control variables, and fixed-effects models. This indicates that patient capital is not always a catalyst for digital transformation; its inherent long-term orientation and risk tolerance, under certain conditions, may actually delay the company's digitalization process by inducing strategic resource misallocation, weakening management's incentives for transformation, and strengthening external network lock-in.

Further analysis of the mediation mechanism provides an internal logical explanation for the aforementioned main effects. The study found that patient capital has not effectively transformed into a strategic resource driving digital transformation. Instead, due to its path dependence on existing business models, it may cause companies to confine resources to traditional areas, crowding out flexible investments for the digital future. Simultaneously, the relatively stable governance environment created by patient capital may weaken management's sense of urgency in responding to external competitive pressures and proactively seeking disruptive change, thus inhibiting the momentum of digital transformation at the incentive level. Furthermore, heterogeneity analysis clearly characterizes the boundary conditions of this impact. The effect of patient capital is significantly moderated by the characteristics of the enterprise itself: in asset-intensive enterprises, the long-term nature of patient capital aligns with the huge sunk investment requirements of asset-heavy digital transformation, thus exhibiting a weak promoting effect; while in technology-intensive enterprises, the prudence of patient capital may conflict with the enterprise's existing high-tech-risk, high-innovation-intensity decision-making path, leading to a particularly strong inhibiting effect. These findings collectively indicate that the relationship between patient capital and digital transformation is complex and context-dependent, not a simple linear promoting relationship.

Based on the above conclusions, this paper proposes the following practical recommendations. For enterprises, blindly introducing or relying on patient capital is not a panacea for promoting digital transformation. Decision-makers need to first carefully assess their own enterprise type and strategic positioning. Asset-intensive enterprises can utilize patient capital more strategically, directing its investment to long-term projects closely related to the intelligent upgrading of physical assets. Technology-intensive enterprises, on the other hand, need to be wary of the innovation inertia and path dependence that patient capital may bring. They should focus on building a governance mechanism that can balance long-term strategic focus and short-term innovation vitality, ensuring that patient capital does not become a "comfort zone" that inhibits exploratory digital innovation. For policymakers and investors, policy design aimed at guiding capital to serve the real economy should go beyond the dimension of "quantity" and delve into the levels of "quality" and "structure." Policy incentives

should not vaguely encourage long-term capital, but should be more targeted, designing mechanisms to guide patient capital to the key links of digital transformation in asset-intensive industries, while providing technology-intensive enterprises with a more flexible financing environment and governance guidance conducive to stimulating breakthrough innovation, thereby maximizing the positive role of capital in driving the healthy development of the digital economy.

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