ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

The Impact of Government Subsidies on the Digital Transformation of Manufacturing Enterprises: An Empirical Study Based on Listed Companies in China

Wenhao Pei

School of Finance, Zhongnan University of Economics and Law, Wuhan, China, 430073
peiwenhao1128@163.com

Abstract: *Amidst the dual backdrop of profound global economic restructuring and the pursuit of high-quality development objectives, the digital transformation of the manufacturing sector has emerged as a critical driver for enhancing industrial resilience and national competitiveness. As a crucial policy intervention instrument, the mechanisms and efficacy of government subsidies in addressing the challenges faced by manufacturing enterprises during digital transformation and fostering transformative momentum warrant in-depth investigation. Utilizing a sample of Chinese A-share listed manufacturing enterprises from 2012 to 2022, this study systematically investigates the impact of government subsidies on corporate digital transformation and its underlying mechanisms. Empirical results demonstrate that government subsidies significantly advance the digital transformation process within manufacturing enterprises. This effect operates primarily through two core channels: alleviating financing constraints and stimulating corporate technological innovation. This research not only contributes to the theoretical literature on government intervention and corporate digital transformation but also offers crucial empirical evidence and policy guidance for the formulation and implementation of more targeted and effective subsidy policies aimed at accelerating the digital upgrade of the manufacturing sector.*

Keywords: *Government Subsidies, Digital Transformation, Financing Constraints, Technological Innovation, Manufacturing Enterprises*

1. Introduction

Amidst profound global economic restructuring and accelerated sustainable development, manufacturing's digital transformation is a critical driver for global economic advancement and industrial upgrading. Rapid digital technology advancements (e.g., cloud computing, AI, big data) provide strong impetus. Societally, digital transformation addresses systemic industrial-era contradictions, such as energy consumption versus green development [1], structural employment imbalances, and supply chain fragmentation, highlighting its role in mitigating societal risks. However, substantial obstacles persist, including "technological incapacity," "resource and policy constraints," and "apprehension about adaptation." Moreover, digital transformation, reshaping production, operations, and brand strategies, entails high investment risks and uncertain returns. This potential asymmetry between private and social benefits can dampen managerial innovation incentives, fostering inertia [2] and impeding firms' digital adoption.

Government subsidies, the "visible hand," are core policy instruments for resource allocation, reflecting a global "policy toolkit competition." For instance, China's "14th Five-Year Plan for Digital Economy Development" advocates accelerating digital development and manufacturing's digital transformation. The EU, US, and other economies have implemented similar policies. These initiatives indicate digital transformation has transcended technological upgrading, becoming a core strategic tool for supply chain resilience and national economic fortitude. World Bank estimates show a strong positive correlation between manufacturing digitalization and national total factor productivity, and a reduced likelihood of supply chain disruptions from geopolitical shocks, thus acting as an economic buffer.

Focusing on China's A-share listed manufacturing firms, this study examines the impact of government subsidies on enterprise digital transformation. It analyzes underlying mechanisms, specifically how subsidies stimulate technological innovation and alleviate financing constraints, thereby revealing transmission pathways for this promotional effect. The study further investigates

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

heterogeneous effects across ownership structures and industry categories, analyzing overall policy consistency. This research aims to enrich theory from a micro-firm perspective and inform the design of more effective, differentiated subsidy policies by identifying varying impacts across diverse enterprise characteristics and developmental stages.

2. Literature Review

2.1 The Impact of Government Subsidies

Research on government subsidies has evolved from market failure theory to the new industrial policy paradigm, with literature generally categorized into discussions of positive and negative externalities. First, some studies emphasize the various positive externalities of R&D subsidies on corporate innovation, indicating that government subsidies can stimulate corporate technological innovation and are highly correlated with the number of patent applications[3]. Government subsidies indirectly provide firms with a form of government endorsement, which is viewed favorably for corporate development and stock prices, while also alleviating financing constraints in their innovation activities[4]. Second, government subsidies may entail negative externalities. Governments, in selecting subsidy recipients, might misallocate resources due to firms' misrepresentation of performance). Furthermore, instances exist where firms engage in deliberate strategic behavior to obtain subsidies.

2.2 The Impact of Enterprise Digital Transformation

The rapid development of the digital economy has introduced new data, platforms, and information as critical elements for manufacturing enterprises. Essentially, digital transformation is the reconfiguration of a firm's dynamic capabilities to adapt to digital technologies, requiring deep integration and synergistic adjustment with management practices to drive systemic changes in organizational structure, operational efficiency, and business model innovation. Internally, it assists firms in integrating data, aligning demand with resources, and optimizing operations by activating data value, accelerating data circulation, and precisely matching resources [5], thereby reforming business models[6]. Successful transformation necessitates not only technological and operational capabilities and R&D support but also critical material resources like foundational software and hardware. Externally, government fiscal policies, including direct expenditures and tax incentives, are primary drivers. Direct science and technology project expenditures inject R&D funds, mitigating innovation risks and advancing transformation. Tax incentives reduce burdens, helping firms overcome resource limitations and accelerate digital upgrading. Moreover, government subsidies, as positive operational signals, broaden financing channels and attract investors, addressing resource, technological, and paradigmatic obstacles in digital transformation.

2.3 Literature Review and Contribution

Existing research has extensively explored the economic effects of government subsidies, acknowledging their positive roles in stimulating innovation and alleviating financing constraints, while also highlighting the risks of potential resource misallocation and rent-seeking behaviors. Concurrently, enterprise digital transformation, as a crucial measure for addressing technological change and enhancing competitiveness, has seen its driving factors garner attention, including the activation of data value, operational optimization, and external policy incentives such as fiscal spending on science and technology and tax incentives. Although some literature suggests that government subsidies, as positive signals, might assist enterprises in overcoming transformation barriers, systematic empirical research specifically addressing how government subsidies directly influence the digital transformation of manufacturing enterprises and their precise mechanisms of action remains notably scarce. This identifies a pertinent research gap for the present study.

The primary contributions of this paper are as follows: Grounded in the practical context of Chinese manufacturing enterprises, it empirically tests the direct promotional effect of government subsidies on corporate digital transformation using micro-data from listed companies. It deeply analyzes and validates that the alleviation of financing constraints and the stimulation of technological innovation vitality are two key transmission pathways through which government subsidies exert their influence. Concurrently, by examining heterogeneous factors such as enterprise ownership and the educational attainment of senior executives, the study reveals the differentiated effects of subsidies, thereby providing more targeted empirical evidence for policy formulation.

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

3. Theoretical Analysis and Research Hypotheses

3.1 Government Subsidies and the Digital Transformation of Manufacturing Enterprises

The digital transformation of manufacturing enterprises, a profound revolution crucial for high-quality national economic development, faces objective resource constraints like technology and capital and subjective obstacles such as information asymmetry and risk aversion. Proactive government innovation subsidies are essential to overcome these challenges and stimulate endogenous motivation for transformation. This study, grounded in signaling theory and the resource-based view, analyzes the intrinsic mechanisms driving this subsidy-led digital transformation.

From a signaling perspective, government innovation subsidies are policy instruments that transmit credible, government-endorsed signals, reducing information asymmetry in the digital transformation market and attracting diverse capital[7]. Information asymmetry critically constrains market mechanisms; subsidies mitigate external investors' cognitive biases about a firm's innovation and transformation prospects, thereby alleviating financing constraints and reducing costs. Furthermore, policy signals significantly guide managerial decision-making. Targeted subsidies for manufacturing digitalization act as strong governmental guidance, enhancing strategic awareness and shifting corporate decision-making towards digital empowerment, thus fueling endogenous transformation.

From the resource-based view, government innovation subsidies serve as crucial external resources that enable manufacturing enterprises to overcome inherent deficiencies in endogenous resource endowments critical for digital transformation, thereby enhancing their core competitiveness. Specifically, these subsidies can be precisely channeled to address innovation bottlenecks by directly funding R&D activities. This financial liquidity assists firms in surmounting "bottleneck" technological challenges, establishing a solid technological foundation and potential first-mover advantage for digitalization. Furthermore, recognizing the need for diverse factor inputs, government subsidies offer targeted support for acquiring digital talent, constructing new digital infrastructure, and procuring essential software and hardware. This assistance significantly improves corporate digital resource allocation, mitigates critical factor shortfalls, and provides robust guarantees for the effective strategic implementation of digital transformation. Based on the above analysis, the following hypothesis is proposed:

Hypothesis H1: Government subsidies have a positive effect on the digital transformation of enterprises.

3.2 Mechanism Analysis of Government Subsidies on the Digital Transformation of Manufacturing Enterprises

3.2.1 Alleviating Financing Constraints

Sufficient financial investment is crucial for enterprise digital transformation, yet financing constraints significantly impede this process [8]. Digital transformation projects in manufacturing are typically capital-intensive, requiring substantial and sustained input for infrastructure, R&D, talent, and technology, which often leads to investor caution due to long return cycles and inherent uncertainties. Government innovation subsidies can effectively alleviate these financing dilemmas. They directly provide financial resources, augmenting internal funds available for digitalization. More importantly, subsidies exert a signaling effect, enhancing external financing accessibility by conveying positive signals about a firm's innovation potential and prospects, thereby reducing investor risk perception and lowering financing barriers. Based on the above analysis, the following hypothesis is proposed:

Hypothesis H2a: Government subsidies indirectly promote the digital transformation of manufacturing enterprises by alleviating their financing constraints.

3.2.2 Promoting Technological Innovation

Government innovation subsidies significantly catalyze corporate technological innovation, thereby establishing a crucial technological foundation for digital transformation. As the primary driver of development, technological innovation is the core engine of enterprise digital transformation, enhancing digital competitiveness and fostering high-quality corporate development. However, enterprises often face insufficient endogenous motivation for innovation due to constraints like long R&D cycles, high investment risks, and strong externalities. Precisely allocated government subsidies can effectively compensate for this lack of internal drive, invigorating corporate technological innovation.

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

Furthermore, active engagement in technological innovation is a key driver of the digital transformation process in manufacturing, providing continuous endogenous momentum. Digital transformation is a profound revolution centered on digital technological innovation, not merely equipment upgrades. Technological innovation achievements—such as breakthroughs in AI, big data, cloud computing, IoT, and blockchain—provide the "hard-core" support, driving shifts in production, business, and organizational models. Concurrently, an enterprise's inherent technological innovation capability serves as the "endogenous engine"; for a strategic change as critical as digital transformation, independently controllable innovation capability is paramount. Based on the above analysis, the following hypothesis is proposed:

Hypothesis H2b: Government subsidies indirectly promote the digital transformation of manufacturing enterprises by stimulating their technological innovation activities.

4. Research Design

4.1 Data Sources and Sample Processing

The core data required for this study comprise two parts: government subsidies and digital transformation. Specifically, data on government innovation subsidies are sourced from the annual reports of A-share listed manufacturing enterprises and the China Research Data Service Platform (CNRDS). Data concerning the digital transformation of manufacturing enterprises are derived from the annual reports of the selected sample companies. Concurrently, all control variables utilized in the subsequent empirical analysis are obtained from the China Stock Market & Accounting Research (CSMAR) database. This paper selects relevant data and annual reports from Shanghai and Shenzhen A-share listed manufacturing companies spanning the period 2012-2022 as the research sample. The aforementioned data are processed as follows: 1) exclusion of companies designated as ST, *ST, PT, and those that have terminated their listing; 2) exclusion of listed companies with severe deficiencies in key financial data; 3) to mitigate the interference of extreme values, all continuous variables are winsorized at the 1st and 99th percentiles.

4.2 Variable Definitions

4.2.1 Dependent Variable: Digital Transformation

Drawing upon previous literature, this study employs Python to extract relevant keywords from the annual reports of Shanghai and Shenzhen A-share listed manufacturing companies from 2012 to 2022 and calculates their frequencies. After multiple rounds of text processing, including the removal of stop words, the total frequency of digital keywords is obtained. The digital transformation indicator, denoted by the variable Digital, is then calculated as the ratio of the frequency of digital keywords to the total word count in the annual report. A higher value of this indicator signifies a greater degree of digital transformation.

4.2.2 Core Explanatory Variable: Government Subsidies

This paper constructs the government innovation subsidy indicator (Subsidy) as the ratio of the amount of government innovation subsidies to the enterprise's operating revenue. This metric is intended to represent the relative incentive level of government subsidy policies on corporate innovation behavior.

4.2.3 Control Variables

This paper selects the following control variables: firm size (Size), leverage (Lev), operating revenue growth rate (Growth), return on equity (ROE), firm age (FirmAge), cash flow (Cashflow), proportion of independent directors (Indep), and the ownership concentration of the top ten shareholders (Top10).

4.3 Econometric Model and Data

Based on the theoretical analysis, the following baseline econometric model is constructed to examine the impact of government innovation subsidies on the digital transformation of manufacturing enterprises:

$$Digitalit = \alpha_0 + \alpha_1 Subsidy_{it} + \alpha_2 Controls_{1t} + Year_t + Firm_i + \varepsilon_{it} \quad (1)$$

In the econometric model formulated for this study, the subscripts i and t denote the individual firm and the observation year, respectively. The dependent variable Digital measures the degree of digital

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

transformation of manufacturing enterprises. The core explanatory variable Subsidy represents the innovation subsidies provided by the government, and its corresponding coefficient, α1 aims to quantify the net effect of these subsidies on enterprise digital transformation. If the coefficient α1 is significantly positive, the empirical results will support research hypothesis H1. Controls represents a set of control variables included in the model to mitigate potential omitted variable bias. Furthermore, the model incorporates time-fixed effects (Year) and firm-individual fixed effects (Firm) to control for other unobserved factors that do not vary over time or across individuals. ε denotes the random error term of the model. Descriptive statistics for the main variables subsequently used in this research are presented in Table 1.

5. Empirical Analysis

5.1 Correlation Analysis

Table 1 presents the Pearson correlation coefficient matrix for the digital transformation of manufacturing enterprises (Digital), government subsidies (Subsidy), and the relevant control variables. The results indicate a significant positive correlation between government subsidies (Subsidy) and enterprise digital transformation (Digital), preliminarily suggesting that government subsidies may promote enterprise digital transformation. Government subsidies (Subsidy) also exhibit correlations with some control variables; however, these correlation coefficients are relatively low, implying a potentially low risk of severe multicollinearity, which will be further examined subsequently. Significant correlations are also observed among the control variables, necessitating their inclusion in the regression analysis to identify the independent impact of each factor on the digital transformation of manufacturing enterprises. In summary, the correlation analysis provides an initial indication of the linear associations among the variables, laying a foundation for the subsequent examination of the effect of government subsidies on the digital transformation of manufacturing enterprises.

Table 1: Correlation Analysis Matrix

	Digital	Subsidy	Size	Lev	Growth	ROE	FirmAge	Cashflow	Indep	Top10
Digital	1									
Subsidy	0.171***	1								
Size	0.708***	0.107***	1							
Lev	0.340***	0.024***	0.490***	1						
Growth	0.038***	0.036***	0.077***	0.046***	1					
ROE	0.115***	0.00700	0.080***	-0.253***	0.324***	1				
FirmAge	0.105***	0.049***	0.177***	0.128***	-0.065***	-0.043***	1			
Cashflow	0.112***	-0.022***	0.080***	-0.178***	0.040***	0.416***	0.051***	1		
Indep	-0.020***	0.079***	-0.036***	-0.015**	0.00100	-0.018**	-0.00700	-0.00300	1	
Top10	-0.016**	-0.019***	-0.071***	-0.213***	0.067***	0.252***	-0.193***	0.124***	0.054***	1

5.2 Baseline Regression Results

Table 2: Collinearity Analysis Results

Variable	VIF	1/VIF
Lev	1.560	0.641
ROE	1.540	0.651
Size	1.460	0.686
Cashflow	1.250	0.798
Growth	1.160	0.864
Top10	1.130	0.882
FirmAge	1.080	0.926
Subsidy	1.020	0.977
Indep	1.010	0.988
Mean VIF	1.250	

As indicated by the collinearity analysis results in Table 2, the control variables demonstrate a good degree of mutual independence: the independent variables included in the model are largely independent of each other, explaining relatively unique portions of the variance in the dependent variable with minimal information overlap. Due to the absence of severe multicollinearity, the coefficient estimates of the regression model are relatively stable and less susceptible to minor variations in the sample data or the influence of other variables in the model. This enhances the interpretability of the direction and magnitude of the regression coefficients. The collinearity results provide evidence for the appropriateness

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

of the model specification in this study, indicating that the selected control variables, while controlling for potential confounding factors, do not introduce severe multicollinearity problems, thereby offering a theoretical basis for the subsequent empirical results.

Table 3 presents the baseline regression results for the impact of government innovation subsidies on the digital transformation of manufacturing enterprises. All regressions control for time and individual fixed effects. Column (1) in Table 3 does not include control variables, only controlling for firm-individual fixed effects and time-fixed effects. Column (2) builds upon Column (1) by incorporating control variables. The baseline regression results in both Column (1) and Column (2) consistently show that government subsidies have a significant positive impact on the digital transformation of manufacturing enterprises, and this effect is highly significant at the 1% level. This core finding validates Hypothesis H1 proposed in this study, namely that government subsidies promote the enterprise digitalization process, thereby providing an empirical foundation for the testing of subsequent related hypotheses.

Table 3: Baseline Regression of Government Subsidies on the Digital Transformation of Manufacturing Enterprises

	Digital	
VARIABLES	(1)	(2)
Subsidy	0.080***	0.031***
	(6.649)	(2.822)
Controls	No	Yes
Constant	15.648***	-2.388***
	(433.786)	(-2.813)
Company-Fe	Yes	Yes
Year-Fe	Yes	Yes
Observations	18,849	18,849
R-squared	0.164	0.284

5.3 Robustness Test

Referencing the practice of replacing variable measurement methods in Pan and Gao (2022), this study tests the robustness of its baseline regression results by altering the measurement of both explanatory and dependent variables. Specifically, the core explanatory variable, government subsidies (Subsidy), is replaced in Table 4 with the ratio of government subsidies to total corporate assets (Subsidy_ratio) to examine the impact of their relative scale on enterprise digital transformation. Concurrently, the dependent variable, enterprise digital transformation (Digital)—initially measured by keyword frequency—is replaced in Table 4 with the proportion of intangible assets related to the digital economy from financial statements (Digital_asset_ratio), aiming to more directly measure digital investment via asset structure. When using Subsidy_ratio as the core explanatory variable, its regression coefficient remains significantly positive, indicating that a larger relative scale of government subsidies more significantly promotes enterprise digital transformation; Table 4's R-squared demonstrates good model fit. Similarly, when employing the original Subsidy measure alongside the new Digital_asset_ratio, the subsidy coefficient remains significantly positive, reflecting a positive impact on corporate investment in digital intangible assets. The R-squared value in Table 4 is further improved under this specification, suggesting the model has stronger explanatory power for corporate investment in assets related to digital transformation. The regression coefficients of the control variables largely maintain consistency in their signs and significance with the baseline results after these changes, further validating the robustness of the research findings.

Table 4: Robustness Test Results

	(1)	(2)
VARIABLES	Digital_asset_ratio	Subsidy_ratio
Subsidy	0.418***	1.061***
	(41.375)	(21.956)
Controls	Yes	Yes
Constant	-0.305	-5.021***
	(-0.541)	(-7.879)
Company-Fe	Yes	Yes
Year-Fe	Yes	Yes
Observations	18,849	18,849
R-squared	0.567	0.619

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

5.4 Mechanism Analysis

5.4.1 Alleviating Financing Constraints Mechanism

To investigate how government subsidies drive enterprise digital transformation, this study examines the mediating mechanism of financing constraint alleviation. Table 5, Column (1) tests subsidies' impact on corporate financing constraints. External capital is vital for innovation, yet SMEs often face significant financing constraints due to information asymmetry and agency conflicts. Government subsidies, as direct external funding, can theoretically alleviate these capital shortages, supporting digital transformation. This paper measures financing constraints via an index (FC) based on corporate financial characteristics (e.g., leverage, profitability, cash holdings), with higher values indicating greater constraints. Regression results (Table 5, Column (1)) show a significantly negative coefficient for government subsidies (Subsidy), indicating subsidies reduce corporate financing constraints. This offers preliminary evidence that subsidies, by injecting capital, alleviate external financing pressures during digitalization, thereby promoting transformation.

5.4.2 Promoting Technological Innovation

Technological innovation is a key driver for enterprises to adopt and implement digital technologies. Government subsidies, as an important policy instrument, can incentivize enterprises to increase R&D investment and carry out technological innovation activities by reducing corporate innovation costs and raising expectations of innovation returns. The number of patent applications filed by an enterprise is a commonly used indicator of technological innovation output, directly reflecting the enterprise's efforts in technological breakthroughs and intellectual property creation, and serving as an important dimension for examining the endogenous motivation for enterprise digital transformation. The regression results in Column (2) of Table 5 show that the coefficient of government subsidies (Subsidy) is significantly positive, indicating that government subsidies can effectively incentivize corporate technological innovation activities. This provides empirical support for the notion that government subsidies may promote the digital transformation process by stimulating corporate innovation vitality, leading firms to more actively engage in the R&D and application of digital technologies. The alleviation of financing constraints and the enhancement of technological innovation jointly constitute two important pathways through which government subsidies promote enterprise digital transformation.

Table 5: Mechanism Test Results

	(1)	(2)
VARIABLES	FC	Inno
Subsidy	-0.004**	0.046***
	(-2.323)	(3.762)
Controls	Yes	Yes
Constant	4.760***	-10.505***
	(46.128)	(-11.587)
Company-Fe	Yes	Yes
Year-Fe	Yes	Yes
Observations	18,849	18,849
R-squared	0.546	0.197

6. Conclusion and Policy Recommendations

6.1 Research Conclusion

A-share listed manufacturing enterprises are undergoing systemic digital transformation, becoming a vital force for high-quality economic development. Using panel data from Chinese A-share manufacturing firms (2012-2022), this paper systematically investigates the effect of government subsidies on enterprise digital transformation and its underlying mechanisms. Empirical research indicates that government subsidies significantly promote this digitalization process. Further mechanism analysis reveals this promotional effect is primarily achieved by: first, overcoming bottlenecks in digital technological innovation, and second, alleviating corporate financing constraints.

6.2 Policy Recommendations

To optimize the impact of government subsidies on enterprise digital transformation, a holistic policy

ISSN 2616-5902 Vol. 7, Issue 8: 57-64, DOI: 10.25236/AJBM.2025.070808

approach is imperative. This involves meticulously refining subsidy systems for enhanced precision and stronger incentive effects, targeting specific transformation stages—from infrastructure development to R&D and innovative business model deployment—and addressing diverse enterprise needs, such as prioritizing SMEs, non-SOEs, and R&D in technology-intensive sectors. Concurrently, robust intellectual property protection, including clear data ownership and stringent enforcement, is crucial. Furthermore, amplifying subsidies' guiding influence requires fostering a multi-stakeholder innovation ecosystem. This includes transparent information platforms(potentially leveraging blockchain), promoting industry-academia-research collaboration with targeted support, and developing accessible digital service platforms to reduce SME transformation costs. Ultimately, ensuring sustainable transformation momentum necessitates a comprehensive long-term mechanism: a multi-dimensional evaluation system linking outcomes to funding, complemented by risk compensation frameworks for bolder innovation, and rigorous ex-post regulatory oversight for effective fund use, policy credibility, and high-quality digitalization.

References

[1] Cheng Qiongwen, Ding Hongyi. The Impact of Tax Incentives on the Digital Transformation of Resource-Based Enterprises [J]. Journal of Management, 2022, 19(8): 1125-1133.
[2] Du Chuanzhong, Wang Chuang, Guo Silei. The Impact of Government Innovation Subsidies on the Digital Transformation of Manufacturing Enterprises [J]. Fiscal Research, 2023, (12): 69-82.
[3] Michela Matarazzo, Lara Penco, Giorgia Profumo, Roberto Quaglia. Digital Transformation and Customer Value Creation in Made in Italy SMEs: A Dynamic Capabilities Perspective [J]. Journal of Business Research, 2021, 123: 642-656.
[4] Zhen Hongxian, Wang Xi, Fang Hongxing. Intellectual Property Administrative Protection and Enterprise Digital Transformation [J]. Economic Research, 2023, 58(11): 62-79.
[5] Sun X , Sun W , Wang Z .Novel enterprises digital transformation influence empirical study[J].PLoS ONE (v.1;2006), 2024, 19(1):23.DOI:10.1371/journal.pone.0296693.
[6] Simon Chanias, Michael D. Myers, Thomas Hess. Digital Transformation Strategy Making in Pre-Digital Organizations: The Case of a Financial Services Provider [J]. Journal of Strategic Information Systems, 2019, 28(1): 17-33.
[7] Zhu Hong, Liu Lan. Empirical Research on the Incentive Effect of Differentiated Innovation Subsidies [J]. Modern Economic Discussion, 2023, (4): 99-112.
[8] Mattia Bianchi, Samuele Murtinu, Vittoria G. Scalera. R&D Subsidies as Dual Signals in Technological Collaborations [J]. Research Policy, 2019, 48(9): 103821.