

Digital Transformation of Enterprises, Operating Cash Flow and Environmental Information Disclosure

Xiao Wu

International College, Zhengzhou University, Zhengzhou, China

seannawuu@outlook.com

Abstract. This paper takes Shanghai-Shenzhen A-share listed companies from 2007 to 2020 as a research sample to explore the impact of digital transformation of enterprises on environmental information disclosure and its internal mechanism. The research results show that the digital transformation of enterprises can significantly suppress the level of environmental information disclosure and from the perspective of the action path, the digitalization of enterprises is suppressed by reducing the cash flow of operating activities. Considering financing constraints and executive equity incentive, we found that the financing constraints strengthen the inhibitory effect of enterprise digital transformation on environmental information disclosure, and the executive equity incentive weakens the inhibitory effect of enterprise digital transformation on environmental information disclosure. Finally, the results of the heterogeneity analysis show that enterprise digitization has a more obvious environmental information disclosure suppression effect in the samples which are state-owned and with a low level of marketization. The research in this paper expands the existing literature on the driving factors of environmental information disclosure and the value effect of enterprise digital transformation, questions the traditional view that enterprise digitalization enhances the level of environmental information disclosure, and provides an empirical basis for further deepening the research of enterprise environmental information disclosure in the digital situation.

Keywords: Digital Transformation; Environmental Information Disclosure; Operating Cash Flow; Financing Constraints; Executive Equity Incentive.

1. Introduction

The intelligent age has come to us. McKinsey in its Digital globalization: The new era of global flows report through the global 97 countries between 1995 and 2013 trade data analysis points out that the data flow directly created the value of about \$2.2 trillion, also by indirectly promoting other types of cross-border communication, for the global economic value of about \$2.8 trillion, data contributed great energy to economic development[1]. According to PWC's 2017 Digital Index Survey, 88% of enterprises explicitly integrate digitalization into their enterprise strategy[2].

At present, the value effect test of enterprise digitization focuses on the economic performance or financial performance of enterprises, and the research on the non-economic performance of enterprises is extremely scarce. In fact, as China accelerates to promote high-quality economic development and promote common prosperity, non-economic performance has become an important foundational content for high-quality and sustainable development of enterprises in the face of the global sustainable development wave.

Given this, the possible marginal contribution of this paper lies in that, different from the view of existing literature (Xiao Hongjun et al., 2021)[3] that enterprise digitalization can promote corporate social responsibility, based on the degree of enterprise digitalization transformation, this paper takes operating cash flow as the mediating factor, and financing constraints and executive equity incentives as the moderating variables and makes a systematic and in-depth study on the influence mechanism of digital transformation on environmental information disclosure.

2. Theoretical analysis and hypotheses

2.1 Digital transformation and environmental information disclosure

Although digitization helps enterprises gain competitive advantages and realize value creation, but also causes many risks and challenges in corporate governance (Zhang Xinmin and Chen Deqiu, 2020)[4]. Qiu and Guo[5] mentioned that the digital economy promotes the rising value chain of SMEs, but they cannot afford the high fixed cost of participating in the value chain and lack core technologies as well, small enterprises are easy to be locked at the low-end of the digital-based production network as their participation in the value chain deepens. Based on the above analysis, the following hypothesis is proposed:

H1: Enterprise digital transformation can reduce the level of enterprise environmental information disclosure, that is, enterprise digital transformation has an inhibitory effect on environmental information disclosure.

2.2 Internal action mechanism: Operating Cash Flow

With the continuous social changes, labor costs and material costs are constantly rising, which makes the cost leading enterprises gradually lose their advantages. Also, with the continuous expansion of the scale of enterprises, the requirements for advanced technology are constantly increasing. Therefore, the digital transformation of enterprises will take place and crowd out too many financial resources, thereby reducing the operating cash flow, ultimately squeezing out the investment in environmental governance, and inhibiting the effect of corporate environmental information disclosure. Based on the above analysis, this paper proposes the hypothesis that:

H2: The digital transformation of enterprises can reduce operating cash flow, thus inhibiting the level of enterprise environmental information disclosure.

2.3 Digital transformation, financing constraints, and environmental information disclosure

When enterprises regard enterprise environmental governance as an investment opportunity, the change of financing constraints will affect their motivation and behavior choice to implement environmental governance. If enterprises have strong financing constraints, they tend to use limited funds for production activities with high economic benefits instead of choosing environmental governance, ultimately reduce environmental information disclosure. Based on the above analysis, the hypothesis is made:

H3: Financing constraint has a negative moderating effect on the relationship between enterprise digital transformation and environmental information disclosure, that is, enterprise digital transformation has a stronger inhibitory effect on environmental information disclosure under the condition of high financing constraint.

2.4 Digital transformation, executive equity incentive, and environmental information disclosure

Executive equity incentive can strengthen the value interaction and value reciprocity between enterprises and stakeholders under the background of digitalization, better construct and improve the stakeholder participation mechanism under the enterprise digitalization, form the symbiotic field between enterprises and stakeholders, and strengthen the long-term strategic orientation of enterprises (Wang Haimei, etc., 2014)[6], then it is more likely to improve the level of environmental information disclosure of enterprises. To test the above points, the following hypotheses:

H4: Executive equity incentive has a positive moderating effect on the relationship between enterprise digital transformation and environmental information disclosure, that is, the stronger executive equity incentive is, the weaker inhibitory effect of enterprise digital transformation on environmental information disclosure. Through the above theoretical analysis, the research model of this paper is obtained, as shown in Figure 1:

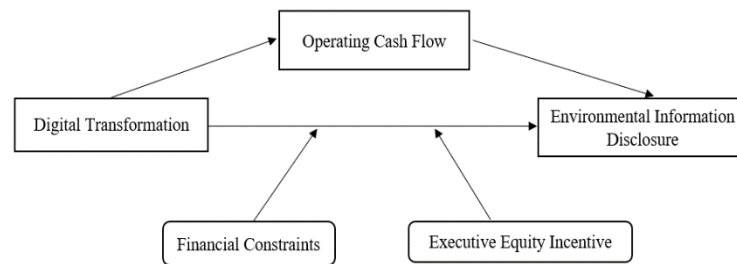


Figure 1. Study model.

3. Research design

3.1 Sample data

Considering the continuity of the keyword feature network of digital text mining and the data of information disclosure of the enterprise environment of listed companies, the sample of this paper mainly selects listed companies from 2007 to 2020, and all the original data are from the CSMAR database. Based on the existing research practices, the data are processed as follows: first, excluding financial enterprises; second, excluding samples of ST*, ST and PT; third, excluding missing samples; fourth, to exclude the influence of extreme values, this paper performs Winsorize tail reduction of 1% of continuous variables. Finally, a total of 15,398 company-annual sample observations were obtained.

3.2 Variable selection

3.2.1 Predicted variable: Environmental Information Disclosure (EID)

Using the Information Disclosure Index to define the level of information disclosure is a commonly used method in the relevant literature. The environmental information disclosure index we designed includes two projects: qualitative and quantitative descriptions of environmental information, mainly based on the information needs of information users. Referring to the method that most foreign scholars (Cooke, 1989; Raffoournier, 1997) [7][8] have used, this paper uses the "content analysis method" to score the environmental information disclosure content of listed companies to get the total performance score of the environmental information disclosure system of each enterprise. The performance evaluation index system of environmental information disclosure of listed companies in this paper has 5 first-level indicators and 30 specific indicators, shown in Figure 2.

Indicators	The specific content	Scoring criteria
Environmental management disclosure	Environmental protection concept, environmental protection goal, environmental protection management system, environmental protection education and training, environmental protection special action, environmental incident emergency mechanism, environmental protection honors or awards, "three at the same time" system	2 points for quantitative disclosure, 1 point for qualitative disclosure, no points for non-disclosure
Environmental supervision and certification disclosure situation	Key pollution monitoring units, pollutant discharge standards, environmental emergencies, environmental illegal events, environmental petition cases, whether through ISO14001 and ISO9001 certification	
Environmental information disclosure carrier situation	Listed company annual report, social responsibility report, environmental report	
Environmental liability disclosure situation	Waste water, COD, SO, CO ₂ , soot and dust emissions, industrial solid waste production	
Environmental performance and governance disclosure	Waste gas emission reduction, waste water emission reduction, dust and dust, solid waste utilization and disposal, noise and light pollution control, clean production implementation	

Figure 2. Evaluation form of Environmental Information Disclosure.

3.2.2 Explanatory variable: Enterprise Digital Transformation

This paper refers to Huang Dayu et al. (2022)[9] to carry out frequency statistics on the keywords of "enterprise digital transformation" designed in the annual report of listed enterprises to describe the degree of transformation.

3.2.3 Moderator Variables: Financing Constraints, Executive Equity Incentive

The indicators that measure financing constraints are mainly investment-cash flow sensitivity, KZ index, and WW index. Compared with the KZ index, the WW index not only considers the financial characteristics of the enterprise itself, but also considers the external industry characteristics of the enterprise, which makes it have broader economic significance, and the calculation of this index eliminates the Tobin q-value, which also improves the accuracy. Therefore, this paper uses the WW index to measure the level of financing constraints of enterprises. Referring to Zhao Shifang et al. (2020)[10], this paper takes the proportion of executive shareholding as the proxy variable of executive equity incentive to reflect the intensity of corporate executive shareholding.

3.2.4 Controlled variables

This article refers to Zhao Shifang et al. (2020)[10], Yangzhen et al. (2021a[11]; 2021b[12]. Related research selects Company Size, Asset-Liability Ratio, Return on Assets, Growth Rate of Operating Income, Company Age, Size of the Board of Directors, Proportion of Independent Directors, Dual Role of Board of Directors, Shareholding Ratio and Equity Nature, etc.

In summary, all the variable definitions presented in this article are shown in Figure 3:

Type of variables	Variable name	Variable Symbol	Variable-definition
Predicted variable	Environmental Information Disclosure	EID	The total score of 30 indicators of environmental information disclosure
Explanatory variable	Digital Transformation	DLTN	The sum of the frequency of digital transformation keywords in the company report
Mediator variable	Operating Cash Flow	Cashflow	Net cash flow from operating activities / total assets
Moderator variable	Financing Constraints	WW	WW Financing constraint Index
	Executive Equity Incentive	Mshare	The portion of equity held by executives
Controlled variable	Return on Assets	ROA	(Net profit) / the average balance of total assets
	Return on Investment	ROI	(Current value of investment-cost of investment)/cost of investment
	Asset-Liability Ratio	Lev	Total liabilities / total assets of the Company
	Company Size	Size	Natural logarithm of the total assets of the company
	Growth Rate of Operating Income	Growth	(Amount of current period-amount of total revenue in the same period of last year) / (Amount of total revenue in the same period of last year)
	Company Age	Age	The time between the current year and the year of listing of the Company
	The largest shareholder's shareholding	Top 1	Number of shares held by the largest shareholder / Total number of shares
	The second to tenth largest shareholders' shareholdings	Top 2to10	The second to tenth largest shareholders' shareholdings / total number of shares
	Whether audited by the Big 4	Big 4	Audited by PWC, KPMG, Deloitte, or Ernst & Young, 1, otherwise, 0
	The proportion of independent directors	Indep	The number of independent directors of the company divided by the number of total directors
	CEO Dualit	Dual	The directors and shareholders are the same people, 1, otherwise, 0
	Equity Nature	SOE	If the actual controller is a state-owned enterprise, 1, otherwise, 0

Figure 3. Variable Definitions.

3.3 Model setting

This article refers to Xiao Hongjun et al. (2021)[3] . For hypothesis H1 and hypothesis H2, the models are set as follows:

$$EIDit = \alpha_0 + \alpha_1 DLTN + \alpha_i \sum Controlsit + \epsilon it \quad (1)$$

$$EIDit = \alpha_0 + \alpha_1 Cashflowit + \alpha_i \sum Controlsit + \epsilon it \quad (2)$$

$$EIDit = \alpha_0 + \alpha_1 DLTN + \alpha_2 Cashflowit + \alpha_i \sum Controlsit + \epsilon it \quad (3)$$

Among them, model (1) mainly tests hypothesis H1, namely the predicted variable is Environmental Information Disclosure (EID), and the explanatory variable is Enterprise Digital Transformation (DLTN); For model (2), the predicted variable is Enterprise Digital Transformation(DLTN), explanatory variable is Operating Cash Flow (Cashflow); For model (3), the predicted variable is Environmental Information Disclosure(EID), the explanatory variable is Enterprise Digital Transformation (DLTN), the mediator variable is Operating Cash Flow.

This paper sets models (4) to test hypothesis H3 and hypothesis H4:

$$EIDit = \alpha_0 + \alpha_1 DLTN + \alpha_2 Moderatorit + \alpha_3 DLTN \times Moderatorit + \alpha_i \sum Controlit + \epsilon it \quad (4)$$

For model (4), the predicted variable is Environmental Information Disclosure (EID), and the explanatory variable is Enterprise Digital Transformation (DLTN). This paper selects two moderator variables: Financing Constraint (WW) and Executive Equity Incentive (Mshare). Controlsit are the controlled variables selected for this article.

4. Empirical results

4.1 Basic regression

Based on the model (1) setting, the OLS regression method is used to empirically test the research hypothesis H1, that is, to examine the specific impact of enterprise digital transformation (DLTN) on environmental information disclosure (EID), to verify whether the hypothesis H1 is valid. The regression results in Figure 4 show that after the gradual addition of corporate digital transformation, the influence of controlled variables such as corporate financial characteristics and corporate governance characteristics is always negative. In column (3) of Figure 4, the coefficient of enterprise digital transformation (DLTN) on environmental information disclosure (EID) is -0.020, which has passed the significance test at the 1% level, indicating that the higher the digitalization degree of enterprises, the lower the level of environmental information disclosure. Therefore, hypothesis H1 in this paper is supported by empirical results.

VARIABLES	(1)	(2)	(3)
	EID	EID	EID
DLTN	-0.013*** (-3.62)	-0.021*** (-5.76)	-0.020*** (-5.45)
ROA		7.073*** -3.64	7.671*** -4.03
ROI		-0.115*** (-3.16)	-0.111*** (-3.12)
Lev		-0.017 (-0.48)	-0.006 (-0.17)
Size		1.814*** -20.77	1.511*** -15.91
Growth		-0.847*** (-7.94)	-0.716*** (-6.68)
Age		0.015 -0.86	-0.007 (-0.42)
Top 1			-0.002 (-0.26)
Top2to10			0.002 -0.19
Big 4			1.967*** -4.55
M3salary			-3.747*** (-5.78)
Indep			0.395 -0.36
Dual			0.006 -0.48
SOE			0.810*** -3.61
Constant	1.727*** -3.39	-37.564*** (-18.89)	-32.264*** (-15.40)
Observations	15,398	15,398	15,398
Adjusted R -squared	0.249	0.35	0.364
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Figure 4. Basic regression results.

Note: Parentheses are the t-value adjusted for the deviation; * *, * and * indicate the statistically significant levels of the two-tailed test at 1%, 5%, and 10%, respectively, the same below.

4.2 Inspection of the intermediary mechanism: Operating Cash Flow

VARIABLES	(1)	(2)	(3)
	EID	Cashflow	EID
DLTN	-0.038*** (-16.04)	-0.000*** (-6.92)	-0.036*** (-15.32)
Cashflow			10.856*** (14.35)
Controls	YES	YES	YES
Constant	-34.705*** (-34.19)	0.019* (1.76)	-34.910*** (-34.62)
Observations	15,398	15,398	15,398
Adjusted R -squared	0.192	0.201	0.203
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Figure 5. Results of Intermediary Mechanism.

In order to test the research hypothesis H2, that is, whether the digital transformation of enterprises inhibits the level of environmental information disclosure by reducing the cash flow of operating activities, this paper adopts the mediation variable test method. Column (2) of Figure 5 shows that the coefficient of enterprise digital transformation on operating cash flow is -0.000. Through the significance test at 1% level, it indicates that enterprise digital transformation reduces cash flow of operating activities. Furthermore, after the operating cash flow is included, column (3) of Figure 5 shows that the coefficient of enterprise digital transformation on environmental information disclosure is -0.036, which is higher than the coefficient of -0.038 in column (1) and passes the 1% significance level test. Therefore, hypothesis H2 in this paper is supported by empirical results.

4.3 The Moderating Effect

The regression results in column (2) of Figure 6 show that the coefficient of the interaction term (WW×DLTN) between financing constraints and enterprise digital transformation is 0.023, which passes the significance test at the 1% level, that is, financing constraints produce a negative moderating effect between enterprise digital transformation and environmental information disclosure, and the research hypothesis H3 is supported.

VARIABLES	(1)	(2)	(3)
	EID	EID	EID
DLTN	-0.039*** (-16.09)	-0.060*** (-10.43)	-0.044*** (-13.84)
WW		1.612*** (8.47)	
WW ×DLTN		-0.023*** (-3.80)	
Mshare			-2.516*** (-4.12)
Mshare ×DLTN			0.049*** (2.81)
Controls	YES	YES	YES
Constant	-34.711*** (-34.18)	-35.031*** (-34.50)	-34.226*** (-33.28)
Observations	15,398	15,398	15,398
Adjusted R -squared	0.192	0.196	0.193
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Figure 6. The moderating effect.

The regression results in column (3) of Figure 6 show that the coefficient of the interaction term (Mshare × DLTN) between executive equity incentive and enterprise digital transformation is 0.049, which passes the significance test at the 1% level. Executive equity incentive has a positive

moderating effect between enterprise digital transformation and environmental information disclosure, research hypothesis H4 is supported by empirical results.

5. Robustness Test and Further Analysis

5.1 Robustness test

This paper tests the robustness in three dimensions:

5.1.1. Replace the core explanatory variables.

Considering the diversity of enterprise digital transformation measures, this paper re-estimates the research hypothesis H1 by taking the logarithm of the number of digital transformation frequencies to further verify the robustness of the master hypothesis test conclusion. As can be seen from Figure 7 (1), the digital transformation of enterprises still has a significant inhibitory effect on environmental information disclosure and has passed the significance test at the 1% level.

5.1.2 Delete the samples.

To exclude the effects of special years, this paper further tests the robustness of the conclusions by excluding the samples from 2007,2008, and 2020. As can be seen from column (2) in Figure 7, after excluding relevant samples, the impact of enterprise digital transformation on environmental information disclosure is still significantly negative, and it has passed the significance test at the 1% level.

5.1.3 First-order time lag.

In this paper, the explanatory variable and controlled variables are processed with one period lag. As can be seen from column (3) of Figure 7, the impact of enterprise digital transformation on environmental information disclosure is still significantly negative after a lag of one period, and it has passed the significance test at the 1% level, indicating that the inhibitory effect of enterprise digital transformation on environmental information disclosure is still robust.

VARIABLES	(1)	(2)	(3)
	EID Replace explanatory variables	EID Delete Samples	EID First-order time lag
LnDLTN	-0.302*** (-4.22)		
DLTN		-0.019*** (-5.22)	
L.DLTN			-0.020*** (-4.77)
Constant	-32.481*** (-15.50)	-32.652*** (-15.44)	-32.157*** (-13.50)
Controls	YES	YES	YES
Observations	15,398	14,688	11,249
Adjusted R -squared	0.364	0.367	0.367
Industry FE	YES	YES	YES
Year FE	YES	YES	YES

Figure 7. Test of robustness.

5.2 Endogenous Testing

VARIABLES	(1)	(2)
	First stage	Second stage
	DLTN	EID
mean_DLTN	0.9887*** (0.006)	
DLTN		-0.0383*** (0.002)
Controls	YES	YES
Constant	-16.3947*** (2.142)	-34.7046*** (1.015)
Observations	15,398	15,398
Adjusted R -squared	0.637	0.192
Industry FE	YES	YES
Year FE	YES	YES

Figure 8. Endogeneity test (instrumental variable method).

This paper further alleviates the endogeneity problem based on the instrumental variable method and selects the mean value of the digitalization level of region, industry and year as the instrumental variable. Therefore, hypothesis H1 is tested again based on two-stage regression. Column (1) of Figure 8 tests the correlation between the two. It is found that the digitalization mean of the region-year industry is significantly correlated with the digitalization of individual enterprises, but there is no direct logical correlation with the environmental information disclosure of individual enterprises. In the second-stage model regression results in column (2) of Figure 8, the digital transformation of enterprises still has a significant negative impact on the level of environmental information disclosure, and the coefficient still passes the 1% significance level test, indicating that the research hypothesis H1 is still valid.

5.3 Heterogeneity Discussion

This paper examines the heterogeneity of the impact effect of enterprise digital transformation on environmental information disclosure from the perspectives of property rights and the degree of marketization.

VARIABLES	(1)	(2)	(3)	(4)
	EID State-owned property right	EID Non-state property right	EID High degree of marketization	EID Low degree of marketization
DLTN	-0.030*** (-4.67)	-0.015*** (-3.47)	-0.018*** (-4.81)	-0.032*** (-2.64)
Constant	-34.408*** (-11.50)	-25.388*** (-8.47)	-30.030*** (-12.40)	-41.341*** (-9.19)
Controls	YES	YES	YES	YES
Observations	7,976	7,422	12,533	2,828
Adjusted R -squared	0.418	0.293	0.368	0.390
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Figure 9. Test of heterogeneity.

The regression results of columns (1) and (2) in Figure 9 show that the impact of enterprise digitization has a significant negative driving and inhibitory effect on state-owned enterprise social responsibility, while the non-state-owned property rights (private enterprises) are difficult to produce a corresponding significant inhibitory effect. This shows that under the condition of property heterogeneity, private enterprises dominated by market logic need digital reconstruction and

stakeholder value network to create a space to better capture the value of the external stakeholders, so as to enhance the level of corporate environmental information disclosure.

The results of columns (3) and columns (4) in Figure 9 show that in the case of the relatively imperfect formal system, the inhibitory effect of enterprise digital transformation on environmental information disclosure is more significant. This shows that in the regional institutional environment with a relatively insufficient institutional environment, the incentive, evaluation, and governance effect of corporate social responsibility by stakeholders in the capital market is weaker.

6. Research Conclusion

The conclusion of this paper has two implications for enterprise strategic decision-making and government policy making:

First, in terms of corporate governance, in the process of promoting digital transformation, enterprises should evaluate their financial status and strategic position, and gradually carry out the digital strategic transformation on the premise of ensuring that other business activities and the performance of social responsibilities of the company are not affected. At the same time, attention should be paid to the influence of external conditions of financing constraints, and the financial stability of enterprises should be well controlled to better promote environmental governance and improve the level of environmental information disclosure of enterprises. In addition, it is necessary to maintain the long-term incentive orientation for senior executives, reduce the agency costs between the principal and the agent under the modern enterprise system with the separation of ownership and control, and improve the intrinsic compatibility of interests between the principal and the agent as much as possible. Specifically, enterprises should fully integrate the digital strategy into the enterprise operation strategy, and strive to improve the interaction efficiency and value reciprocity between enterprises and internal and external stakeholders through digital platform construction and internal digital management methods.

Second, at the level of government policy, institutional supply conducive to digital transformation and enterprise environmental information disclosure should be provided. On the one hand, we should continue to optimize the macro policy framework to promote the digital transformation of enterprises and promote enterprises to accelerate the construction of the digital system in the process of high-quality development. On the other hand, it is necessary to accelerate the construction of the enterprise environmental information disclosure system under the involvement of digital technology and construct the enterprise environmental information disclosure system oriented to the involvement of digital technology based on the responsibility orientation, value orientation, and meaning orientation, to better promote the enterprise based on digital involvement and digital transformation to empower the sustainable development of society.

References

- [1] McKinsey's official website, <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-globalization-the-new-era-of-global-flows>.
- [2] PWC China's official website, <https://www.pwccn.com/zh/services/consulting/digitalconsulting/publications/digital-iq-2017.html>.
- [3] Xiao Hongjun, Yang Zhen, Liu Meiyu. Social responsibility promotion effect of enterprise digitization: the test of internal and external dual paths [J]. *Economic Management*, 2021,43, (11): 52-69.
- [4] Zhang Xinmin, Chen Deqiu. In the era of mobile Internet, enterprise business model, value creation, and governance risk --are based on the case analysis of Luckin coffee financial fraud [J]. *Managing World*, 2020,36, (05): 74-86 + 11.
- [5] Qiu Ying, Guo Zhuming. Research on the Mechanism and Policy of Digital Economy in Promoting the Value Chain Climbing of Small and Medium-sized Enterprises in China [J]. *International Trade*, 2019, (11): 12-20 + 66.

- [6] Wang Haimei, Lu Xiaojing, Lin Wanfa. The impact of foreign equity and senior executives and institutional shareholding on corporate social responsibility -- is based on the empirical study of Chinese A-share listed companies [J]. Accounting Research, 2014, (08): 81-87 + 97.
- [7] Cooke, Terence. "Disclosure in the Corporate Annual Reports of Swedish Companies." Accounting and Business Research 1989, (19):113-124.
- [8] Raffournier, Bernard. "The determinants of voluntary financial disclosure by Swiss listed companies." European Accounting Review 1997, (4):261-280.
- [9] Huang Dayu, Xie Huobao, Zou Mengting. Does financialisation inhibit digital transformation? Modern Finance and Economics (Journal of Tianjin University of Finance and Economics), 2024, 42(07):57-73.
- [10] Zhao Shifang, Jiang Xu, Ying Qianwei, Huo Da. --is based on the perspective of enterprise innovation [J]. Nankai Management Review, 2020, 23, (06): 76-87.
- [11] Yang Zhen, Ling Hongcheng, Chen Jin. Economic policy uncertainty, corporate social responsibility, and enterprise technological innovation [J]. Scientific Research, 2021, 39, (03): 544-555.
- [12] Yang Zhen, Ling Hongcheng, Chen Jin. Does social trust help companies fulfill their social responsibilities? [J]. Scientific Research Management, 2021, 42, (05): 143-152.