

How Corporate Digital Transformation Affects ESG Performance: Empirical Evidence from Chinese Listed Enterprises

Jiayi Liu^a, Zijing Wu^b

Ginling College, Nanjing Normal University, Nanjing, China

^a2562231047@qq.com, ^b1506351849@qq.com

Abstract

This study investigates how corporate digital transformation influences ESG performance using panel data from Chinese A-share listed firms over the period 2013–2025. A firm-level digital transformation index is constructed based on the frequency of digital-related keywords appearing in annual reports. It is found that the corporate digital transformation has a significant positive effect on ESG performance. In other words, the higher the degree of digital transformation, the better the ESG performance of enterprises. Further research proves that the impact of digital transformation on ESG performance is more significant in state-owned enterprises, large-scale enterprises and enterprises in high-tech industries. Thus, this paper verifies the value of digital transformation in empowering enterprise sustainable development, and provides an empirical basis and practical guidance for listed enterprises to optimize ESG performance with the help of digital transformation.

Keywords

Corporate digital transformation, ESG performance, nature of property rights, digital-quality integration.

1. Introduction

As a key driver of high-quality economic growth, the digital economy has emerged as a critical strategic direction for China's economic development. The 20th National Congress of the Communist Party of China emphasized the need to "promote the deep integration of the digital economy and the real economy." Similarly, the 2024 Central Economic Work Conference stressed the importance of enhancing enterprise efficiency and quality through digital transformation, while accelerating the development of new drivers for high-quality growth. Meanwhile, the ESG concept—an essential benchmark for evaluating corporate sustainability—has attracted considerable attention across various sectors. In the context of the deepening integration between the digital economy and sustainable development, digital transformation is increasingly influencing areas such as production, operations, environmental management, and corporate governance, thereby serving as a significant lever for improving ESG performance. Consequently, how to leverage digital transformation to support ESG efforts and achieve coordinated development among digital technology, environmental protection, social responsibility, and governance has become a key topic in both business practice and academic research.

At present, domestic and foreign scholars have carried out relevant explorations around digital transformation and enterprise ESG performance. Some studies have confirmed that digital transformation can positively promote enterprise ESG performance by enhancing green technology innovation, optimizing information disclosure and improving internal control. However, there is still room for further deepening in the previous research. The identification of the causal relationship between the two in the existing research needs to be strengthened,

and the discussion on the heterogeneous boundary of digital transformation affecting ESG performance is fragmented. Thus, is the positive impact of corporate digital transformation on ESG performance robust? Is there a significant difference in this impact among enterprises of different natures of property rights, size and industry? This paper attempts to study the above problems and provide empirical evidence for digital transformation to empower enterprise ESG construction.

Taking China's Shanghai and Shenzhen A-share listed enterprises from 2013 to 2025 as a research sample, this paper empirically explores the impact and heterogeneity of corporate digital transformation on ESG performance. Compared with previous research, the contribution of this paper is reflected in three aspects. First, based on the perspective of digital-quality integration and digital empowerment for sustainable development, digital transformation and enterprise ESG performance are incorporated into a unified analysis framework, and the empowerment mechanism of digital technology on enterprise ESG governance is systematically explored, so as to enrich the theoretical connotation of intersecting digital transformation and enterprise sustainable development. Secondly, it not only systematically clarifies the effective boundaries and resource constraints of digital transformation to empower ESG performance, but also reveals the core logic that the ESG empowerment effect of digital transformation needs to be based on the premise that enterprises have corresponding resource endowments, and provides an accurate theoretical basis for enterprises to conduct differentiated practice of digitalization and ESG integration. Thirdly, in the robustness test, manufacturing sub-samples are selected to carry out a shortened sample test, which verifies the industry stability of the core conclusion, providing a novel inspection idea for related research.

2. Literature Review

Most early scholars carried out independent research on the economic effects of digital transformation and the value effects of ESG, which laid a theoretical foundation. Early research separately examined the economic consequences of digital transformation and the value implications of ESG performance. For instance, Deng and colleagues (2013) linked ESG practices to stakeholder value creation. Meanwhile, Bloom et al. (2014) highlighted how information technology reshapes organizational structures. From an ESG perspective, Atan et al. (2018) provided empirical evidence supporting its positive role in firm performance. Liu (2020) revealed the path of digital transformation to improve manufacturing productivity. Meanwhile, Chatterji et al. (2016) conducted an analysis around the consistency and value connotation of enterprise ESG ratings, which paved a methodological way for quantitative measurement and value identification of ESG performance; Da Silva et al. (2016) enriched the research on corporate governance and information quality from the perspective of accounting information timeliness, while YANG et al. (2019) expanded the research on the economic consequences of corporate information disclosure from the perspective of capital market pricing and investor behavior; Liu et al. (2013) earlier explored the impact of manufacturing informatization on industry productivity, providing early empirical evidence for the research on economic effects of digital transformation; Chiarini (2021) explored the inherent connection between Industry 4.0 technology and manufacturing environmental performance, providing theoretical support for the intersection of digitalization and environmental governance; Qiu et al. (2019) verified the mitigating effect of ESG performance on corporate financing costs; Li et al. (2021) further clarified the innovation transmission mechanism of ESG affecting corporate performance, and continuously improved the theoretical framework of ESG value effect, but the research at this stage has not yet formed the integration analysis of digitalization and ESG[1-11].

In recent years, the correlation between digital transformation and ESG performance has been a research hotspot. On the one hand, the existing research focuses on examining the direct impact of digital transformation on ESG performance, confirming that digital transformation can significantly improve the ESG performance of enterprises by promoting green technology innovation, optimizing information disclosure, and improving internal governance (Hu et al., 2023; Wang et al., 2023). The instrumental variable method also further verifies a positive causal relationship between the two (Wang et al., 2024). The digital transformation of heavily polluting enterprises and manufacturing enterprises has an empowering effect on ESG performance (Wang et al., 2024; Shi et al., 2025). Qi et al. (2024), Zhou et al. (2025), and Zhu et al. (2025) have all reached the conclusion that digital transformation has a positive driving effect on enterprise ESG performance based on empirical research on samples of listed enterprises in China. Zhang et al. (2025) and Zhang et al. (2025) focused on the path of green innovation and deepened the analysis of channels for digital transformation to empower ESG performance. Zhang et al. (2023) further expanded the internal mechanism of digital transformation affecting ESG from the perspective of differentiating the substantive and strategic aspects of green innovation. Chen et al. (2025) also explored the differentiation between digitalization, ESG and green innovation, enriching the research connotation of the technology transmission path. In addition, Jia et al. (2025) systematically sorted out the multi-dimensional improvement path of enterprise ESG performance under the background of digital transformation. Chen et al. (2025) tested the driving effect of ESG performance on digital transformation from a reverse perspective. Miao (2025) also supplemented the governance constraint effect of digital transformation from the perspective of ESG greenwashing, making the research on the interaction between the two more comprehensive. On the other hand, scholars have deeply explored the heterogeneity boundary and transmission mechanism of the relationship between the two. It is found that the promotion role of digital transformation on ESG performance is only significant in state-owned enterprises, large-scale enterprises and enterprises in high-tech industries (Han et al., 2024). The research of Yang et al. (2024) on the new energy industry also verified the heterogeneity difference brought by industry attributes, in which total factor productivity and green innovation play a mediating transmission effect (Wang et al., 2024)[12-24].

3. Study Design

3.1. Variable Selection

(1) Corporate ESG performance. In this paper, the ESG performance of enterprises is selected as the explained variable, which is used to measure the comprehensive level of enterprises in the environmental, social and corporate governance. At present, academia has not yet formed a unified standard for the measurement of enterprise ESG performance. Some scholars adopt a third-party rating comprehensive score and other ways for measurement. Following the approach of Wang et al. (2024), the Huazheng ESG rating is adopted as the primary metric for ESG performance. This rating system ranges from C- (lowest) to AAA (highest), which we convert into a 9-point scale (1 to 9) for empirical analysis. The higher the score, the better the comprehensive performance of enterprises in environmental governance, social responsibility fulfillment and corporate governance standardization.

(2) Corporate digital transformation. This paper selects corporate digital transformation as the core explanatory variable, which aims to measure the degree of corporate digital integration. Currently, academia has not unified its measurement. Liu et al. (2023) adopted the DEA-Malmquist index to measure the informatization related to digitalization, which finds it difficult to collate data. In this paper, according to the method of Hu et al. (2023), based on the annual

report of enterprises, the word frequency of digital-related keywords is counted, and the index (DT) is obtained after logarithmic processing to measure the corporate digital transformation. (3) Control variables. To avoid other factors affecting the ESG performance of enterprises, this paper refers to Zhang et al. (2025), and selects the control variables as follows: enterprise size (LnSize), return on assets (ROA), asset-liability ratio (lev), market value (Tobin Q), shareholding ratio of the largest shareholder (top1), and nature of enterprise (SoE)[25-31].

Table 1. Description of Variables

Variable	Name	Symbol	Definition
Explained Variable	ESG Performance	ESG	Huazheng ESG rating, 1-9 points from C- to AAA
Explanatory Variable	Digital Transformation	DT	Natural logarithm of keyword frequency +1 in annual reports
Control Variables	Enterprise Size	LnSize	Natural logarithm of total assets
	Return on Assets	ROA	Net Profit/Average Total Assets ×100%
	Asset-liability Ratio	lev	Total Liabilities/Total Assets ×100%
	Market Value	TobinQ	Enterprise Market Value/Total Assets
	Shareholding Ratio of the Largest Shareholder	top1	Percentage of number of shares held by the largest shareholder to total number of shares
	Nature of Enterprise	SoE	Dummy variables: State-owned enterprises are 1 and non-state-owned enterprises are 0

3.2. Model Construction

In order to explore the impact of corporate digital transformation on enterprise ESG performance, this paper constructs the following model:

$$ESG_{it} = \beta_0 + \beta_1 DT_{it} + \beta_2 Ctrls_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (1)$$

Where ESG represents the ESG performance of the enterprise, DT refers to the corporate digital transformation, *Ctrls* is the control variable, *i* is the individual enterprise, *t* represents the year, λ_i represents the fixed effect of the enterprise, μ_t refers to the fixed effect of the year, and ε_{it} is the random error term.

3.3. Data Source and Processing

With China's listed enterprises from 2013 to 2025 as the research object, this paper adopts all data from the CSMAR database. The sample processing is as follows: (1) Exclude the samples with missing data. (2) Exclude the financial industry sample. (3) Exclude the samples of ST and PT enterprises; (4) Winsorization is performed at the 1% level on both tails for all continuous variables in the model. Finally, yearly observations of 35,760 enterprises are obtained.

4. Empirical Analysis

4.1. Descriptive Statistics

The descriptive statistics of each variable are shown in Table 2. The average ESG performance of enterprises is 4.129, indicating that the average ESG rating is between BBB and A. The mean value of corporate digital transformation is 3.335, with 3.466 as the median. The mean value is slightly lower than the median, which indicates a slightly left-biased distribution. Thus, the digital transformation of sample enterprises as a whole is at a medium level, and the difference in transformation among enterprises is apparent.

Table 2. Descriptive Statistics for Variables

Name	Sample Size	Mean	Standard Deviation	Minimum	Median	Maximum
DT	35760	3.335	1.596	0	3.466	6.683
ESG	33299	4.129	1.028	1	4	7
LnSize	35760	22.424	1.306	20.044	22.237	26.423
top1	35760	0.339	0.146	0.09	0.315	0.742
lev	35760	0.247	0.158	0.002	0.227	0.689
SoE	35760	0.337	0.473	0	0	1
ROA	35760	0.032	0.056	-0.189	0.033	0.185
TobinQ	35759	1.448	1.28	0.204	1.059	7.681

4.2. Analysis of Baseline Regression Results

The baseline regression results are shown in Table 3. Column (1) only controls for enterprise and year fixed effects. Column (1) of Table 3 shows a statistically significant positive coefficient for digital transformation at the 1% level, suggesting that firms with higher digitalization levels tend to achieve better ESG outcomes, even before controlling for other firm attributes. Column (2) further adds control variables based on Column (1), and controls for enterprise and year fixed effects. The regression results demonstrate that the regression is still significantly positive at the statistical level of 10%, indicating that the positive impact of digital transformation on ESG performance remains robust after eliminating disruptive factors. Combining the results of the two columns, the regression coefficient of corporate digital transformation is always significantly positive, which indicates that corporate digital transformation helps to improve enterprise ESG performance.

Table 3. Baseline Regression Results

	(1)	(2)
Variable	ESG	ESG
DT	0.047*** (0.011)	0.021* (0.011)
Constant	3.961*** (0.039)	-1.279** (0.527)
Control Variables		Yes
Enterprise Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
N	33,190	33,190
R^2	0.463	0.472

Note: *, **, * * * denotes significance at the levels of 10%, 5%, and 1%, respectively. In parentheses, the clustering robust standard error at the enterprise level is the same below.

4.3. Heterogeneity Analysis

4.3.1. Heterogeneity of Property Rights of Enterprises

For the heterogeneity of the property rights of enterprises, based on Song et al. (2025), this paper divides samples into state-owned and non-state-owned enterprises to perform group regression. The results are shown in Columns (1) and (2) in Table 4. Among the sub-samples of state-owned enterprises, digital transformation is significantly positive at the statistical level of 5%. However, in the subsample of non-state-owned enterprises, DT is not statistically significant. Several factors may explain this pattern. First, state-owned enterprises serve as key drivers of the national economy and are often entrusted with policy implementation and social duties. As a result, they tend to receive preferential access to policy resources and institutional

support during digital transformation and ESG initiatives. Secondly, non-state-owned enterprises pay more attention to short-term profit targets in market competition, and pay relatively insufficient strategic attention to ESG performance, resulting in the insufficient demonstration of the empowering effect of digital transformation on ESG.

Table 4. Property Rights Heterogeneity Test

Variable	(1)	(2)
	State-owned Enterprises	Non-state-owned Enterprises
	ESG	ESG
DT	0.037** (0.018)	0.007 (0.014)
Constant	0.576 (0.877)	-3.068*** (0.696)
Control Variables	Yes	Yes
Enterprise Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
N	11,608	21,516
R^2	0.478	0.495

4.3.2. Heterogeneity of Enterprise Size

For the heterogeneity of enterprise size, according to the research of Zhang et al. (2025), this paper uses the logarithm of total assets to measure enterprise size, and divides the sample into large-scale enterprises and small and medium-sized enterprises for group regression according to whether the enterprise size is larger than the median of its industry. The results are shown in Columns (1) and (2) in Table 5. The coefficient of digital transformation is 0.041 in the large enterprise subsample. It is significantly positive at the statistical level of 1%. However, in the SME subsample, DT is not significant. This can reflect that larger enterprises have better resource reserves, which can more effectively integrate technology, talents and funds in digital transformation, and promote the implementation of ESG practices. Meanwhile, large enterprises are faced with stricter market supervision and supervision from stakeholders, with more urgent needs for improvement of ESG performance. However, most small and medium-sized enterprises are relatively limited in terms of technology investment, management capabilities and compliance pressure, and the empowering role of digital transformation on ESG performance is difficult to fully reflect.

Table 5. Heterogeneity Test of Enterprise Size

Variable	(1)	(2)
	Large-scale enterprise	SME
	ESG	ESG
DT	0.041*** (0.015)	-0.003 (0.015)
Constant	-2.285*** (0.728)	0.131 (0.762)
Control variables	Yes	Yes
Enterprise fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
N	17,826	15,331
R^2	0.457	0.496

4.3.3. Heterogeneity of Industry Type

For heterogeneity of industry type, according to the method of Qi and Guo (2024), this paper divides the sample into enterprises in high-tech industries and enterprises in non-high-tech industries based on whether the enterprises belong to high-tech industries to perform group regression. The results are shown in Columns (1) and (2) in Table 6. In subsamples of the high-tech industry, the coefficient of digital transformation is 0.025, which is significantly positive at the statistical level of 10%. But in subsamples of the non-high-tech industry, DT is not statistically significant. The reason lies in the fact that enterprises in high-tech industries have stronger technological innovation capabilities and digital foundation, which can more efficiently apply technology to ESG dimensions such as environmental governance, social responsibility fulfillment and corporate governance optimization in digital transformation.

Table 6. Heterogeneity Test of Industry Type

Variable	(1)	(2)
	High-tech Enterprises	Non-high-tech Enterprises
	ESG	ESG
DT	0.025*	0.015
	(0.014)	(0.018)
Constant	-1.748***	-0.521
	(0.675)	(0.937)
Control Variables	Yes	Yes
Enterprise Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
N	21,865	11,241
R^2	0.471	0.503

4.4. Instrumental Variable Method

Table 7. Test Results of Instrumental Variable

Variable	(1)	(2)
	Phase 1	Phase 2
	DT	ESG
L1_DT	0.423***	
	(0.011)	
DT		0.118***
		(0.027)
Control Variables	Yes	Yes
Enterprise Fixed Effect		Yes
Year Fixed Effect		Yes
N	27,911	27,911
F	1527.8	26.79

Based on the research of Wang et al. (2024), this paper selects the digital transformation (L1_DT) of other enterprises in the province where listed enterprises in the same industry are registered in the same year and lag one period as the tool variable of enterprise digital transformation. Columns (1) and (2) of Table 7 report the regression results for phase 1 and phase 2, respectively. In the first phase regression, the coefficient of the instrumental variable is 0.423, which is significantly positive at the 1% level. Thus, it is highly correlated with the endogenous variable DT and meets the correlation requirement. In the second phase regression,

the coefficient of DT is 0.118, which is significantly positive at the 1% level, consistent with the baseline regression. Furthermore, the Kleibergen-Paap rk LM statistic of 646.809 rejects the original hypothesis of insufficient identification of instrumental variables. The Kleibergen-Paap rk Wald F statistic is 1527.801, which is much greater than the critical value of 16.38 for weak instrumental recognition at the 10% level. Thus, there is no weak instrumental variable problem, and the instrumental variable test further verifies the robustness of the core research conclusions of this paper.

4.5. Robustness Test

4.5.1. Replacement of Explained Variables

To verify the robustness of the baseline regression results, this paper uses the method of Kuang and Zhou (2025) to perform a substitution test on the explained variables. The ESG performance of the enterprise is standardized, and standardized ESG indicators (ESG1) are constructed for regression. According to the results of Column (1) in Table 8, the coefficient of corporate digital transformation is 0.020, which is significantly positive at the level of 5%. Thus, the positive impact of digital transformation on ESG performance is still significant, which is consistent with the conclusion of baseline regression and verifies the robustness of baseline regression.

4.5.2. Replacement of Explanatory Variables

Based on the practice of Wang et al. (2024), this paper not only re-measures the degree of corporate digital transformation, but also adopts the proportion of the total word frequency of digital keywords in the annual report to the total text length of the full text of the annual report as an alternative index of digital transformation. Besides, this paper conducts a regression test again. The results prove that the regression of DT1 is significantly positive at the 1% level, which is consistent with the baseline regression conclusion, further confirming that the promoting role of digital transformation on ESG performance is not affected by the substitution of explanatory variables, and the research conclusion is robust.

4.5.3. Subsample Regression

To eliminate the interference of industry characteristics, this paper refers to the method of Song et al. (2025), narrows the sample interval and selects the manufacturing subsample for the regression test. The regression results show that DT is significantly positive at the level of 10%, indicating that the positive promotion effect of corporate digital transformation on ESG performance is still valid after the subsample regression, further verifying the robustness of the baseline regression conclusion.

Table 8. Robustness Test

Variable	(1) Replacement of Explained Variables ESG	(2) Replacement of Explanatory Variables	(3) Subsample Regression
DT	0.020* (0.010)		0.025* (0.014)
DT1		50.982** (22.101)	
Constant	-5.260*** (0.513)	-1.233** (0.528)	-1.745*** (0.676)
Control Variables	Yes	Yes	Yes
Enterprise Fixed Effect	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes
N	33,190	33,190	21,865
R^2	0.472	0.473	0.471

5. Conclusion

5.1. Study Conclusion

With China's A-share listed enterprises from 2013 to 2025 as the research object, this paper empirically analyzes the impact of digital transformation on enterprise ESG performance using enterprise panel data. The findings of this study are as follows. First, the corporate digital transformation has a significant positive effect on ESG performance. Even if various control variables are incorporated and the fixed effect of enterprises and years is controlled, the positive impact remains stable. Secondly, there are apparent heterogeneous characteristics in the improvement of ESG performance by digital transformation. When it comes to property rights, only state-owned enterprises have a significant effect; only large enterprises have a positive impact that passes the significance test in terms of enterprise scale; only corporate digital transformation in high-tech industries can effectively promote the ESG performance from the aspect of industry types. Thirdly, the robustness test results, such as replacing core explanatory variables, explained variables, and subsample regression, all verify that the core conclusions of digital transformation to improve enterprise ESG performance are not affected by variable measurement methods and the scope of sample industries. Besides, it is proven that the research conclusions had good reliability and robustness.

5.2. Policy Recommendations

Based on the above research conclusions, this paper puts forward the following policy suggestions from the governmental aspect. First, it is advised to strengthen the policy support and hierarchical guidance of digital transformation, formulate special support policies for small and medium-sized enterprises and non-high-tech enterprises, improve the construction of digital infrastructure, lower the threshold of digital transformation, and promote the implementation of digital transformation in different types of enterprises. Secondly, it is necessary to improve the institutional guarantee and concept promotion of ESG development, improve ESG-related laws, regulations and evaluation systems, clarify the ESG performance standards of enterprises, encourage enterprises to attach importance to ESG construction through tax incentives and preferential policies, and strengthen social publicity to enhance market players' awareness and emphasis on ESG concepts. Thirdly, it is important to fully play the leading role of baseline enterprises. Relying on the advantages of state-owned enterprises, large enterprises and enterprises in high-tech industries in digital transformation and ESG practice, replicable practical experience should be summarized to guide non-state-owned enterprises and small and medium-sized enterprises, and promote the coordinated development of corporate digital transformation and ESG construction.

References

- [1] Atan, R., Alam, M. M., Said, J., et al. (2018). The impacts of environmental, social, and governance factors on firm performance: Panel study of Malaysian companies. *Management of Environmental Quality*, 29(2), 182–194.
- [2] Bloom, N., Garicano, L., Sadun, R., et al. (2014). The distinct effects of information technology and communication technology on firm organization. *Management Science*, 60(12), 2859–2885.
- [3] Chatterji, A. K., et al. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal*, 37(8), 1597–1614.
- [4] Chiarini, A. (2021). Industry 4.0 technologies in the manufacturing sector: Are we sure they are all relevant for environmental performance? *Business Strategy and the Environment*, 30, 3194–3207.
- [5] Da Silva, A., de Souza, T. R., & Klann, R. C. (2016). The timeliness of accounting information in Brazilian family businesses. *RAE: Revista de Administração de Empresas*, 56(5), 489–502.

- [6] Deng, X., Kang, J. K., & Buen, S. L. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*, 110(1), 87–109.
- [7] Yang, M. J., Cheng, X. K., Sun, Q., et al. (2019). How does analyst forecast dispersion affect SEO discounts in uniform-price auction system? Evidence from investor bids in China. *International Review of Economics & Finance*, 63, 198–208.
- [8] Zhao, Y. (2022). Mutual trust influence on the correlation between the quality of corporate internal control and the accounting information quality using deep learning assessment. *Computational Intelligence and Neuroscience*, 48(9), 126–135.
- [9] Chen, F., & Wu, Q. C. (2025). Impact of enterprises' ESG performance on digital transformation. *Jiangnan Academic*, 44(05), 108–118.
- [10] Chen, Y., Zhang, C. Y., & Zhou, Y. B. (2025). Digital transformation, ESG and enterprise green innovation differentiation: Substantive or strategic innovation? *Study & Exploration*, (10), 126–134.
- [11] Han, Y. M., Hu, J., & Yu, X. R. (2024). Corporate digital transformation and ESG rating disagreement. *Collected Essays on Finance and Economics*, (07), 59–69.
- [12] He, X. J., Sun, J. H., Zhang, Z. H., et al. (2025). A configuration study of manufacturing firm performance improvement paths under the background of digital transformation. *Science and Technology Management Research*, 45(13), 167–174.
- [13] Hu, J., Han, Y. M., & Zhong, Y. (2023). How corporate digital transformation affects corporate ESG performance. *Review of Industrial Economics*, (01), 105–123.
- [14] Jia, F., Long, Z. W., Gao, Y., et al. (2025). On the path of enterprise ESG performance improvement under the background of digital transformation. *Finance and Accounting Monthly*, (S2), 144–153.
- [15] Li, J. L., Yang, Z., Chen, J., et al. (2021). Study on the mechanism of ESG promoting corporate performance: Based on the perspective corporate innovation. *Science of Science and Management of S.&T.*, 42(09), 71–89.
- [16] Liu, F. (2020). How digital transformation improve manufacturing's productivity: Based on three influencing mechanisms of digital transformation. *Finance & Economics*, (10), 93–107.
- [17] Liu, H., Xiao, T., & Xia, J. C. (2013). The effects of informatization in the manufacturing industry on its productivity: A study of provincial panel data based on DEA-Malmquist Index. *Journal of Intelligence*, 32(03), 166–172.
- [18] Miu, S. P. (2025). Research on the impact of corporate digital transformation on ESG performance (Master's dissertation, Yangzhou University).
- [19] Zhang, H., Shi, Y. F., Meng, W. Y., et al. (2025). The impact of enterprise digital transformation on green technology innovation: Based on ESG perspective. *Statistics & Decision*, 41(15), 150–155.
- [20] Qi, L. L., & Guo, F. (2024). A study of the impact of corporate digital transformation on ESG performance. *Statistics & Decision*, 40(23), 173–177.
- [21] Qiu, M. Y., & Yin, H. (2019). An analysis of enterprises' financing cost with ESG performance under the background of ecological civilization construction. *Journal of Qualitative & Technological Economics*, 36(03), 108–123.
- [22] Shi, G. D., Wu, G., & Huang, J. C. (2025). Digitalization transformation and ESG performance of manufacturing enterprises-From the ESG segmentation perspective. *Statistics & Decision*, 41(05), 166–171.
- [23] Song, H. T., Song, X. G., Sun, W., et al. (2025). Enterprise digital transformation, ESG performance and accounting information quality. *Friends of Accounting*, (21), 58–66.
- [24] Wang, J., Hong, Z. H., Duan, Q. Q., et al. (2024). The impact and mechanism of digital transformation of heavily polluting enterprises on ESG performance. *Science and Technology Management Research*, 44(01), 192–205.
- [25] Wang, Q. L., Lin, Y. L., & Huang, X. H. (2024). Research on the impact of corporate digital transformation on ESG performance: Based on the mediation effect of total factor productivity and green technology innovation. *Management and Administration*, (08), 38–45.

- [26] Wang, Y. H., & Guo, Y. Z. (2023). Firm digital transformation and ESG performance: Evidence from China's A-shared listed firms. *Journal of Finance and Economics*, 49(09), 94–108.
- [27] Yang, K. J., & Wang, D. (2024). Research on the impact of enterprise digital transformation on ESG performance-Based on the empirical analysis of China's new energy listed companies. *Journal of Industrial Technological Economics*, 43(12), 83–91.
- [28] Zhang, Y. S., & Yi, C. J. (2025). Enterprise digital transformation, green innovation and ESG performance. *Statistics & Decision*, 41(08), 171–176.
- [29] Zhang, Z. N., Qian, X. Y., & Cao, X. W. (2023). Research on the green innovation effect enterprise digital transformation: substantive innovation or strategic innovation. *Industrial Economic Research*, (01), 86–100.
- [30] Zhou, Z. M., & Wang, X. F. (2025). Digital transformation and enterprise ESG performance: An examination based on mechanism of action and economic consequences. *Friends of Accounting*, (09), 78–86.
- [31] Zhu, H. R., & Zhou, X. H. (2025). Research on the impact of enterprise digital transformation on ESG performance. *China Journal of Commerce*, 34(19), 143–148.