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A Study of the Impact of Digital Transformation on Corporate ESG Performance

—A Threshold Model Based on Environmental Regulation

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Abstract. This study examines the effects of corporate digital transformation on the environmental, social, and governance (ESG) performance of 988 A-share companies listed on the Shanghai and Shenzhen stock exchanges from 2012 to 2022. By employing a fixed-effects model, we delve into how these transformations positively influence ESG outcomes, while acknowledging the regional disparities in these effects. Building upon this, we explore the varied influences of environmental regulations—specifically, administrative directives and market incentives—on businesses' readiness and eagerness to undergo digital transitions. We develop two separate panel threshold regression models to assess these influences. The threshold existence tests reveal distinct single and double thresholds for the effects of each regulatory type. In light of these findings, we posit that fostering a greater number of enterprises to embrace digital transformation for enhanced ESG performance requires a collaborative effort between companies and the government to promote a balanced and sustainable development of China's economic, social, and environmental sectors.

Keywords: digital transformation, ESG, environmental regulation, threshold effect

1. Introduction

In recent years, the earth's ecological environment has taken a sharp turn for the worse, with problems such as ecological damage and resource depletion coming to the forefront, and the implementation of a sustainable development strategy is imminent. The harmonious coexistence of nature and human society is closely related to the business activities of enterprises, therefore, ESG (Environmental, Social and Governance), as an important criterion for measuring the sustainable development of enterprises, has gradually become the focus of the capital market [1]. The 2024 White Paper on China's ESG Development suggests that ESG and China's progress in economic and social spheres are accelerating under impetus of "dual-carbon" goal and high-quality development strategy. In the face of slowing economic growth and fierce market competition, it has become inevitable for traditional enterprises to enhance their competitiveness through digital transformation. In addition, environmental regulation is a series of systems introduced by the government to reduce

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pollution and protect the environment, which are generally divided into two types according to the implementation of administrative orders and market incentives, with the former mainly using administrative means to achieve the purpose of restraining enterprises from destroying the environment; and the latter mainly playing a role in the market through market competition and price mechanism. Under the influence of increasingly sophisticated environmental regulations, it is of great significance how the ESG effect of digital transformation changes.

To explore the above issues, this study employs a fixed-effects model to examine how digital transformation influences the ESG performance of listed Chinese firms on the A-share market from 2012 to 2022. The results clearly demonstrate that digital transformation has a notably positive impact on a company's ESG outcomes. Building on this, the research introduces two panel threshold regression models to explore how different levels of environmental regulation—specifically, administrative orders and market-based incentives—moderate this relationship. The findings reveal that when environmental regulation intensity is relatively low, the beneficial effect of digital transformation on ESG performance is minimal or even negligible. However, as the strength of these regulations increases beyond a certain point, their influence becomes markedly significant, indicating a threshold effect. This suggests that environmental regulation acts as a catalyst, amplifying the positive influence of digital initiatives on ESG results once a critical level is reached. Furthermore, the study examines regional differences and finds that the impact of digital transformation on ESG performance varies across eastern China compared to other regions. Unlike earlier research, this paper offers a more nuanced understanding of the complex interplay between corporate digitalization and ESG outcomes, shedding light on how environmental regulations shape this dynamic and advancing theoretical insights in the field.

2. Theoretical analysis and research hypothesis

2.1. Impact of digital transformation on ESG performance

According to principles of corporate governance, significant information gaps between a company and its stakeholders can easily give rise to issues like adverse selection and moral hazard. These problems tend to drive up the costs associated with overseeing the company and exacerbate potential threats to the rights and interests of stakeholders. The advent of the digital economy offers promising avenues for addressing these challenges. Digital transformation initiatives have catalyzed a fundamental shift in how businesses operate, leading to streamlining processes, cutting costs, and boosting productivity in numerous ways. Such changes enable a more harmonious alignment of economic gains with non-financial goals, fostering a landscape where shareholders and other stakeholders can benefit simultaneously—a true win-win scenario. Several factors underpin this shift: First, digital transformation encourages firms to leverage cutting-edge technologies, including innovations in green tech, which enhance their environmental impact. Second, applying digital tools allows companies to access stakeholder information—whether from customers, employees, or government bodies—more swiftly and accurately, significantly reducing transaction costs caused by information asymmetry. Additionally, this transparency encourages organizations to elevate their internal governance and take greater social responsibility. Third, digital advancements can significantly improve operational and managerial productivity, making ESG practices more dynamic and effective while lowering expenses and increasing overall efficiency [2]. Building on these insights, this research sets out to test the following hypothesis.

H1: Digital transformation improves an organization’s ESG performance.

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2.2. Threshold effects of executive-ordered environmental regulation

Combined with the relevant theories of neoclassical economics, it can be seen that environmental governance inputs will increase the operating costs of enterprises, reduce their profits, and slow down the process of their digital transformation [3]. Administrative command-type environmental regulation sets environmental standards, pollutant emission standards, etc., and restrains enterprises from damaging the environment through administrative penalties, and digital transformation is usually a means of compliance for enterprises to cope with stringent regulatory requirements. At reduced levels of directive environmental governance, companies may continue to rely on traditional production methods and management models while complying with minimal environmental regulatory requirements, and lack sufficient incentives to invest in digitalization, companies have insufficient incentives to digitally transform, and the impact on ESG is weak. With the increasing intensity of command-based environmental regulations, from the internal perspective, high-pressure environments usually expose enterprises to higher operating costs and legal risks, forcing them to apply the benefits of digital technology, including reducing environmental governance costs and improving productivity, to avoid the risks of non-compliance and fines; from the external perspective, the rising intensity of regulations will make more and more enterprises realize the benefits of digital transformation and begin to innovate technology and management. From the external environment, the rise of regulatory intensity will make more and more enterprises realize the benefits of digital transformation and start to innovate technology and management, which will gradually form the scale effect of digital transformation, and the latecomer enterprises can share and learn from the technology and achievements of the early comers, so that they can carry out transformation and upgrading with half the effort, and further expand the dividends of digital transformation. Accordingly, this paper puts forward the following hypotheses:

H2: The influence of digital change on companies' ESG results is nonlinear, showing a threshold effect driven by the strength of executive order-driven environmental regulation.

2.3. Threshold effects of market incentive-based environmental regulation

Market incentive-based environmental regulation is different from administrative order-based environmental regulation in that it requires less government involvement in decision-making, but relies mainly on market instruments and pricing, and enterprises are more likely to actively pursue technological breakthroughs or market leadership rather than passively meet minimum compliance conditions. For example, rising sewage charges will have an impact on firms' production and operation decisions; the more polluting a firm is, the heavier the burden of rising sewage charges will be on it, and the greater the willingness of firms to optimize their factor structure through digital transformation, thereby reducing costs and increasing efficiency [4]. Similarly, when the strength of market-driven environmental policies is weak, firms face fewer environmental compliance costs and thus lack sufficient external impetus to innovate their technologies; whereas, as the intensity of market-incentivized regulations continues to increase, at the national level, the government usually provides more policy incentives, such as green tax incentives and environmental protection subsidies to encourage firms to accelerate the digital transformation process. Financial support in areas such as green economy and green technology innovation can provide financial support and policy guarantee for enterprises' digital transformation, thus more enterprises have higher willingness to increase investment in digital transformation. From the market level, enterprises usually face more intense market competition, which prompts them to continuously optimize their production processes and adopt new technologies to improve productivity and environmental

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compliance, and digital transformation becomes an important means for them to adapt to shifts in the external setting, enhance competitiveness, and to reduce costs. Accordingly, this study posits the following hypothesis:

H3: The influence of digital transformation on a company's ESG results exhibits a nonlinear trend, influenced by a threshold effect driven by the strength of market-incentive environmental regulation.

3. Research design

3.1. Description of variables

3.1.1. Explained variables

The explanatory variable of this paper is corporate ESG performance. Scholars measure ESG mostly in the following two ways: one is to borrow the scoring system of third-party organizations, and the other is to construct a multi-dimensional indicator system. This paper follows the first approach and refers to the literature of former research [5], and adopts the data of CSI's ESG rating system as the independent variable in this study, specifically, the average of CSI's four ratings per year is used as the final data. ESG is taken between 0 and 9, and the bigger the number is, the better the firms' performance is in this aspect.

3.1.2. Core explanatory variables

The core explanatory variable chosen in this paper is digital transformation. Following Wu Fei [4] and others, the proxy variable for the degree of digital transformation of enterprises is selected - the keyword frequency of "digital transformation" in the annual reports of A-share listed companies. The specific data extraction and organization need to use Python, JavaPDFbox library and other tools. Considering the "right skewedness" of this series of data, this paper also carries out logarithmic processing.

3.1.3. Threshold variables

This analysis pinpoints two pivotal thresholds: the strength of environmental governance through administrative decree (EI) and the strength of environmental governance through market incentives (PE). The prevailing approach in the literature is to rely on a single indicator to gauge the intensity of environmental regulation. This includes tracking the volume of regional laws and regulations, presenting graphs of environmental fines imposed, and counting the number of personnel in the environmental protection sector, among other measures. These data points often serve as a stand-in for assessing the force of administrative-driven regulation. Conversely, when it comes to market-based policies, wastewater fees and trading are the go-to tools. Given that China only started imposing an environmental tax in 2018, an increasing number of researchers are employing wastewater fees as a stand-in for evaluating market-driven environmental regulation [6]. Synthesizing existing studies, this paper chooses enterprise environmental protection investment and enterprise sewage charges as two proxy variables for environmental regulation respectively.

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3.1.4. Control variables

The key control factors analyzed include the stake percentage owned by the lead shareholder (sh1), the debt-to-equity ratio (lev), the cash flow to assets ratio (cashflow), the rate of growth in operating earnings (growth), the scale of the firm (size), the age of the company (age), and the proportion of independent directors on the board (indep), employee size (emp), management size (exe), return on assets (ROA). The specific description of each variable is shown in Table 1.

Table 1. Names and descriptions of variables

Variable type	variable name	variable symbol	Description of variables
explanatory variable	ESG performance	ESG	Average annual value of 1-9 for China Securities ESG rating
explanatory variable	Digital Transformation	DT	ln (degree of digital transformation)
Threshold variables	environmental investment	EI	ln (firm's environmental capital expenditure for the year + 1)
	sewage charge	PE	ln (actual payment of sewage charges or environmental protection tax)
control variable	Shareholding ratio of the largest shareholder	sh1	Ownership Percentage of Major Shareholder/Total Share Count
	gearing	lev	Total liabilities/total assets
	cash flow ratio	cashflow	Operating Cash Flow as a Percentage of Total Assets
	Revenue growth rate	growth	(Current year's revenue - last year's revenue)/last year's revenue
	Company size	size	ln (total business assets)
	Company age	age	Current year - year of incorporation +1
	Proportion of independent directors	indep	Number of independent directors/number of directors
	Employee size	emp	ln (number of employees)
	Size of management	exe	ln (number of management staff)
	return on assets	ROA	Net profit/average total assets*100%

3.2. Sample and data sources

The time period of this paper is from 2012 to 2022, and the research object is China's Shanghai and Shenzhen A-share listed companies in this time period, using the CSMAR database to collect financial data including asset-liability ratio, cash flow ratio, etc., and utilizing the CSI ESG ratings and through the Wind database to collect the data of digital transformation. In the process of data processing, in order to ensure the validity of the analysis results, this paper excludes financial companies, delisted companies and enterprises with a large number of missing data, and finally obtains 10,868 valid observations. The descriptive statistics of each variable are shown in Table 2. Among them, the mean value of corporate ESG performance is 4.1481, indicating that the ESG ratings of the sample companies are concentrated in B ~ BB on average, and according to the latest rating results published by SSE, The existing ESG ratings for Chinese companies are typically deemed moderate, indicating significant potential for enhancement; the standard deviation of ESG

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performance is 1.0542, demonstrating a significant gap in ESG ratings among China's publicly traded firms. The average score for the digital transformation level is 1.1782, indicating that the ability of China's listed companies to utilize digital technology is still at a relatively low level, and more resources should be invested in digital transformation; the standard deviation of the degree of digital transformation is 1.2067, highlighting significant disparities in the extent of digitalization among China's listed corporations, and the reasons behind need to be investigated in depth.

Table 2. Descriptive statistics for each variable

variant	average	standard deviation	minimum	maximum
ESG	4.1481	1.0542	1.0000	7.7500
DT	1.1782	1.2067	0.0000	6.0913
EI	0.0899	0.1679	0.0000	12.4328
PE	13.6631	1.4454	6.0845	19.7604
sh1	33.8108	14.6309	0.2900	89.0900
lev	0.4378	0.1933	0.0080	1.0340
cashflow	0.1364	0.1028	0.0008	0.7976
growth	2.4406	0.3951	-0.8053	8.3793
size	3.1464	0.0577	2.9254	3.3880
age	2.9537	0.3164	1.6094	3.7612
indep	0.3781	0.0567	0.1818	0.8000
emp	2.1514	0.1490	1.2232	2.6570
exe	1.7683	0.3763	0.0000	3.1781
ROA	0.0391	0.0635	-0.6448	0.9533

3.3. Modeling and interpretation

To test hypothesis one of this paper, a fixed effects model (1) is constructed:

$$ESG_{i,t} = \alpha_0 + \alpha_1 DT_{i,t-1} + \sum \alpha_j CVs + \sum Year + \sum Firm + \varepsilon_{i,t} \tag{1}$$

In the above model, Corporate ESG performance (ESG) serves as the primary explanatory factor, digital transformation (DT) stands as the central explanatory variable, while overall CV writing experience constitutes the control variables.; time fixed effect Year and individual fixed effect Firm are also controlled; $\varepsilon_{i,t}$ is the random error term. The value and positive or negative of the parameter α_1 reflect the magnitude and direction of the impact of DT on ESG, respectively. In addition, considering that the repercussions of a company's shift to digital operations aren't felt right away. This study holds off on discussing the key factors by a single time period, which accounts for the delay in how the effects ripple through the variables in the real world. This also helps to alleviate some of the endogeneity issues that might arise from a possible cycle where the cause and effect are reversed.

To delve into how various environmental regulations influence the trajectory of digital transformation's impact on a company's ESG performance, this research employs threshold panel regression models to conduct a thorough analysis. Specifically, the Hansen threshold panel regression model is commonly utilized to assess the presence of a threshold effect in such

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investigations. For a specific threshold value γ, when the intensity of environmental regulation is less than or greater than it, the impact of digital transformation on corporate ESG scores has differences, thus, this study obtains panel threshold regression models (2) and (3) after processing the base model (1):

$$ESG_{i,t} = \beta_{10} + \beta_{11} DT_{i,t-1} \times I(EI_{i,t-1} \leq \gamma) + \beta_{12} DT_{i,t-1} \times I(EI_{i,t-1} > \gamma) + \sum \beta_{1j} CVs + \sum Year + \sum firm + \varepsilon_{i,t} \tag{2}$$

$$ESG_{i,t} = \beta_{20} + \beta_{21} DT_{i,t-1} \times I(PE_{i,t-1} \leq \gamma) + \beta_{22} DT_{i,t-1} \times I(PE_{i,t-1} > \gamma) + \sum \beta_{2j} CVs + \sum Year + \sum firm + \varepsilon_{i,t} \tag{3}$$

The meaning of the same variables in model (2)(3) remains the same and $I(*)$ is the indicative function. Also to mitigate potential endogeneity issues, threshold variables $EI_{i,t-1}$ and $PE_{i,t-1}$ are used with a one-period lag, and γ is a threshold-specific value. β_{11} and β_{12} measure the impact of digital transformation on corporate ESG scores under scenarios $EI_{i,t-1} \leq \gamma$ and $EI_{i,t-1} > \gamma$, respectively, and β_{21} and β_{22} are the same. If the selected γ is plausible, then the effect of environmental regulation should show significant differences across intervals, and vice versa is not plausible. The above two models consider only one threshold, but there can be multiple thresholds, set in a similar way.

4. Empirical analysis

4.1. Baseline regression analysis

Table 3 shows the results of the tests of the benchmark regression model in this paper. In particular, columns (1) and (2) are the results of the regression of firms' ESG performance directly on the level of firms' digital transformation, with (2) accounting for annual fixed effects based on (1); and column (3) is the regression result after the addition of control variables. The findings indicate a consistent, positive impact of robust digital transformation on corporate ESG ratings, with statistical significance at the 1% level.

Table 3. Benchmark regression results

variant	(1)	(2)	(3)
	ESG	ESG	ESG
DT_{t-1}	0.0513*** (0.0139)	0.0489*** (0.0107)	0.0564*** (0.0106)
control variable	No	No	Yes
cons	4.0835*** (0.0158)	4.1819*** (0.0218)	5.2866*** (0.7531)
Individual fixation		Yes	
time fixation	No	Yes	Yes
$adjustedR^2$	0.0116	0.0161	0.0565

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% thresholds respectively, accompanied by robust standard errors within parentheses, the same below.

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4.2. Analysis of threshold effects

Considering that different strengths of environmental regulation may make digital transformation have different impacts on corporate ESG, this study employs a panel threshold model to analyze the data, focusing on two key variables: the strength of environmental regulations enacted through executive orders (EI) and market-based incentives (PE). To test for the presence of thresholds, Hansen's methodology was applied, with the results summarized in Table 4 after performing 300 bootstrap resamples. Since the P-values for the triple threshold tests exceed 0.1, we fail to reject the null hypothesis, suggesting that a triple threshold does not exist. In contrast, the double threshold test reveals that the P-value for regulations based on administrative orders is above the usual significance cutoff, whereas the P-value for market incentive regulations is less than 0.001, denoting significance at the 1% level. This indicates the presence of a double threshold effect related to market-oriented environmental regulations. Lastly, the single threshold test for administrative order-based regulation produces a P-value below 0.01, confirming that there is a significant single threshold effect for executive order-driven environmental regulation impacts.

Table 4. Threshold effect for the impact of DT on ESG in different environmental regulatory contexts

Threshold variables	Number of thresholds	F-statistic	P-value	Number of BS	threshold value		
					1%	5%	10%
EI	single threshold	19.790***	0.007	300	11.964	14.598	19.371
PE	dual threshold	38.420***	0.000	300	23.104	17.108	14.460

Table 5 shows the threshold estimates and 95% confidence intervals corresponding to the two types of environmental regulation. The table illustrates that the two environmental regulation types exhibit more pronounced differences in impact across various time frames.

Table 5. Threshold estimates and confidence intervals

Threshold variables	Estimated threshold			95% confidence interval
EI	single threshold	first threshold	0.0040	[0.0294,0.0413]
PE	dual threshold	first threshold	11.8408	[11.6299,11.9071]
		Second threshold	13.4950	[13.4695,13.5626]

Threshold regressions were conducted based on the threshold model and threshold values for the intensity of executive order-based environmental regulation determined in Table 5, with the findings presented in Table 6.

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Table 6. Threshold regression results for executive ordered environmental regulation

variant	threshold value	ESG ($X = EI$)	threshold value	ESG ($X = PE$)
$DT_{i,t-1} \times I\left(X_{i,t-1} \leq \gamma_1\right)$		0.0591 (0.0011)		-0.0689** (0.0227)
$DT_{i,t-1} \times I\left(\gamma_1 < X_{i,t-1} \leq \gamma_2\right)$		-		0.0004 (0.0119)
$DT_{i,t-1} \times I\left(X_{i,t-1} > \gamma_2\right)$	$\gamma_1 = \gamma_2 =$ 0.0040	0.1255*** (0.0167)	$\gamma_1 =$ 11.8408 $\gamma_2 =$ 13.4950	0.0758*** (0.0114)
control variable		Yes		Yes
individual fixed effect		Yes		Yes
Annual fixed effects		Yes		Yes
N		10,868		10,868
Adjusted R^2		0.0505		0.0864

4.2.1. Threshold effects of the intensity of executive-dictated environmental regulation

At environmental regulation levels below 0.004, the digital transformation coefficient is 0.0591, which is due to the fact that when the intensity of this regulation is low, enterprises tend to continue to rely on traditional production methods and management modes, and lack sufficient incentives to invest in digitalization; when the intensity is greater than 0.004, the coefficient becomes a larger 0.1255, which is significant at the 1% level, and this is because as the increasing intensity of regulation, enterprises will generate higher incentives for digital transformation internally in order to avoid higher non-compliance costs by reducing costs and increasing efficiency, and enterprises will also receive stronger incentives externally due to the expansion of digital transformation dividends generated by the scale effect, thus generating stronger and stronger promotion effects on their ESG performance. This confirms the hypothesis H2 proposed in this paper.

4.2.2. Threshold effects of market incentive-based environmental regulatory intensity

When the level of market-driven environmental regulation falls below 11.8408, the impact of a company's digital transformation on its ESG performance tends to be negatively correlated, with a coefficient of -0.0689, significant at the 5% threshold. However, once the market incentive-based regulation exceeds 11.8408 but stays below 13.4950, this relationship shifts to a positive one, indicated by a much lower coefficient of 0.0004, but not significant. The contribution of digital transformation to firms' ESG performance is significantly positive at the 1% level with a coefficient of 0.0758 when the intensity of market-incentivized environmental regulation is higher than 13.4950.This shift suggests that market-incentivized environmental regulation affects the effectiveness of firms' digital transformation differently in different intensity intervals: firms subject to less intense regulation are less motivated to transform due to the smaller default costs and lack incentives to transform, or reduce investment in digital transformation because of rising costs; as the intensity of this regulation becomes larger and reaches the first threshold, the willingness to transform is higher due to the continuous introduction of various green tax and environmental subsidy policies, which reduces the cost burden of enterprises, and the effect of digital transformation on ESG performance turns from negative to positive, and becomes more significant after reaching the second threshold. This may be due to the fact that digital transformation creates a

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scale effect, and enterprises that enter later can get twice the result with half the effort in the process of transformation. This confirms the hypothesis H3 of this paper.

4.3. Robustness tests

To test the robustness of the above findings, this paper first conducts a replacement of the explanatory variables. Specifically, the paper switches to a benchmark regression using the ESG performance scores of listed companies offered via Bloomberg's data repository as explanatory factors, and results show that digital transformation still significantly and positively affects firms' ESG performance at the 5% level. Subsequently, considering that the new crown outbreak in 2020 brings a lot of uncertain impacts at the policy, environmental, and social levels, and is likely to bring disruptions to the process of companies integrating their resources for digital transformation, this study excludes year 2020 from the total data, and redoes the regression analysis, and the findings indicate that the digital transformation of a company markedly influences its ESG scores, which verifies the robustness of the conclusions .

4.4. Heterogeneity test

Due to different resource endowments and development stages, the digital transformation process of enterprises in each region is characterized by significant heterogeneity, and it is hypothesized that the impact of enterprises' digital transformation on their ESG performance may also be regionally heterogeneous [7]. In this paper, we refer to a researcher who divides China into three regions of East, Middle and West from an economic perspective [8]. The fixed-effects model is tested with data from the three regions separately, and the findings indicate enterprise digitalization in eastern region has the strongest positive impact on their ESG, with a coefficient of 0.0590, which is significant at the 5% level, but the promotion effect is slightly weaker in the central and western regions. This difference is likely due to the uneven development of the digital economy and the regional heterogeneity of resource endowments. Specifically, eastern region of China has higher level of comprehensive development, the digital economy has developed earlier, and a certain scale advantage has been formed, both digital infrastructure and new digital talent reserves are more complete, and enterprises have a more suitable environment for digital transformation, as well as providing a solid backing for the application of digital technology to enhance their performance on ESG [9]. In contrast, China's central and western regions lag behind the eastern regions in terms of industrial structure, market improvement, digital infrastructure and other considerations [10], and thus the majority of local enterprises utilize digital technology to innovate and manage their operations to improve ESG performance slightly less effectively than in the eastern regions.

5. Conclusions

This study examines 988 publicly listed companies from Shanghai and Shenzhen A-shares between 2012 and 2022. Using a fixed-effects model, it explores how digital transformation influences corporate ESG performance, while also evaluating the threshold effects of different types of environmental regulation—specifically, administrative command-driven and market incentive-based policies. The findings reveal three key points: first, that embracing digitalization significantly boosts ESG results, and this conclusion remains robust after further testing; second, that the relationship between digital transformation and ESG is nonlinear, with clear threshold effects linked to environmental policies; and third, that the impact varies across regions, indicating regional

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differences in how digital efforts influence ESG outcomes. Based on these insights, the paper recommends a collaborative approach where both businesses and policymakers work together to enhance digital transformation capabilities. Enterprise managers should actively organize digital training and learning; the government can set up special subsidies to provide a platform for the joint efforts of enterprises, universities and research institutions to accelerate the matching of resources and talents. The government should also flexibly set the intensity of environmental regulations, not only to avoid blindly increasing the intensity of environmental regulations to bring an excessive burden to enterprises, but also cannot be too low so that enterprises lack incentives for transformation. Second, focus on the differentiated development between regions, but also to strengthen regional cooperation and win-win situation. Let the eastern region with a more mature digital transformation model drive the relatively backward central and western regions, learn from each other's success stories, and set up a special fund to incentivize the export of talents to the east and the west.

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