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A Study on the Relationship Between ESG Strategic Orientation and Corporate Green Innovation Performance

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Abstract: This study examines the impact of corporate ESG performance on green technology innovation using A-share listed companies in China as research subjects from 2010 to 2024. The findings demonstrate a significant positive correlation between corporate ESG performance and value, indicating that better environmental, social responsibility, and governance practices correlate with higher overall value levels. Mechanism analysis reveals that strong ESG performance not only enhances digital transformation capabilities but also increases media attention, thereby boosting corporate value through information dissemination and image enhancement. Heterogeneity analysis shows that ESG's value-enhancing effects are more pronounced in non-state-owned enterprises and firms with higher rent-seeking tendencies, suggesting stronger regulatory and constraint functions under governance frameworks with weaker structures or greater external pressures. The research provides new empirical evidence for understanding ESG's mechanisms in green technology innovation and value enhancement, offering insights for sustainable development strategies and policy formulation across different enterprise types.
Keywords: Digital-Physical Integration; Manufacturing Industry; Digital Transformation; Digital Infrastructure; Industrial Chain Collaboration

1.Introduction

In the context of China's economic development entering a new normal, environmental pollution and overcapacity have become prominent issues, making green development an essential requirement for high-quality growth. As a crucial pathway for achieving sustainable transformation, green technological innovation can reduce resource consumption and environmental impact. However, due to its "dual externalities," enterprises show limited enthusiasm for independent R&D efforts, and market mechanisms alone struggle to drive progress. In recent years, ESG (Environmental, Social, and Governance) has gradually emerged as a key benchmark for evaluating corporate sustainability and social responsibility, receiving both policy support and market attention in China. ESG not only provides value guidance for companies' green transition but also aligns with the development philosophy of green technological innovation. This study empirically examines the impact of ESG performance on green technological innovation using A-share listed companies from 2010 to 2024 as samples, offering theoretical and practical references for corporate strategic decisions, investor analysis, and government policy refinement. II. Literature

2.Review

2.1 Economic consequences of ESG performance

In recent years, as ESG has gained broader societal acceptance as a holistic concept, scholars have increasingly examined how corporate ESG performance impacts business outcomes. The majority of studies confirm that ESG contributes to improved corporate performance (Yoon et al., 2018; Taliento et al., 2019; Lin Lin et al., 2023; Broadstock et al., 2020). Existing research highlights three key dimensions: securing government policy support through exemplary ESG practices (Wang Zhi and Peng Baichuan, 2022), enhancing productivity through sustainable development strategies (Griffin et al., 2021), and driving innovation for long-term sustainability (Li Jinglin et al., 2021). However, some studies suggest that ESG initiatives may paradoxically hinder performance improvements. Grounded in shareholder-centric theories, early scholars viewed ESG activities—particularly CSR programs—as detrimental to shareholder interests (Barnea et al., 2010). This perspective stems from the inherent conflict between the capital-intensive nature of social responsibility initiatives and shareholders' fundamental pursuit of economic maximization. Furthermore, as the actual operators of enterprises, management teams bear dual pressures compared to shareholders: they not only shoulder capital investments related to social activities but also need to manage cash flow in fiscal revenue. These conflicting demands may trigger severe agency conflicts, increase agency costs, indirectly undermine long-term corporate benefits, and reduce shareholder wealth (Wang Shuangjin et al., 2022). Consequently, this creates a negative correlation between ESG-related initiatives and corporate performance.

2.2 Influencing factors of green technology innovation

Empirical studies on corporate characteristics primarily focus on executive traits and R&D investment. The Senior Management Tier Theory suggests that executives 'personal traits influence their assessment of business environments, thereby affecting corporate decision-making. As direct decision-makers in green technology innovation, the personal characteristics of listed company management directly impact the level of green technological innovation. Research indicates that executives' gender (Galbreath, 2019)[10] and educational background (Yang Mei et al., 2023) foster broader management perspectives and environmental awareness, leading to higher green innovation consciousness among educated executives, which enhances corporate energy efficiency. Beyond personal attributes, executives 'personality traits and career experiences also influence green innovation decisions. Arena's (2017) study shows that arrogant executives tend to underestimate green innovation risks, thereby increasing project investments. CEOs' environmental leadership experiences grant them heightened attention to green technology projects and specialized expertise, making them more inclined to invest in such initiatives (Ling Hongcheng et al., 2024). Alongside executive talent, corporate financial capacity and R&D investment capabilities also significantly impact green technological innovation. Li et al. (2017) found that companies with better financial performance are more capable of funding green technology innovation projects and are more likely to engage in such initiatives[14]. Wang Hui et al. (2024), using enterprise-level patent data, explored the driving effect of public research institutions' green R&D involvement on corporate innovation from the perspective of "dual externalities," revealing that such institutional engagement effectively enhances corporate green innovation capabilities[23]. Finally, research on enterprise digital architecture demonstrates that corporate digital transformation improves green technology innovation levels by enhancing the quality of corporate surplus information and accelerating technological integration capabilities (Zhang Zenan et al., 2023) .

3.Theoretical analysis and research hypothesis

3.1 ESG performance and enterprise green technology innovation

Unlike conventional corporate innovation, green technology innovation serves dual objectives of business growth and environmental protection. This requires enterprises to reduce emissions and improve resource efficiency through eco-friendly process innovations, while simultaneously enhancing competitiveness and economic performance via green product and service innovations. Third-party ESG ratings, as a non-market competitive strategy, drive companies to prioritize environmental protection, social responsibility fulfillment, and corporate governance during operations. Particularly under sustainable development frameworks, strong ESG performance aligns with corporate green transformation needs. Therefore, exemplary ESG performance inevitably drives enterprises to innovate in green technologies.

As stakeholder theory suggests, companies with strong ESG performance often attract more environmentally conscious stakeholders like green investors, eco-organizations, and consumers through their social responsibility commitments. These

stakeholders prioritize long-term growth potential over short-term profits. Consequently, ESG-performing firms not only secure sustainable funding but also leverage stakeholder support to boost competitiveness in green tech innovation, thereby enhancing innovation quality. This virtuous cycle ultimately drives companies to adopt higher quality standards in green tech development, making greater contributions to sustainable development.

In general, enterprises with good ESG performance can obtain more resources, reduce financing costs and attract long-term attention and investment from stakeholders by releasing the signal of green development, thus increasing the quantity and quality of green technology innovation. Based on this, the following hypotheses are proposed:

H1a: ESG performance has a positive impact on the number of green technology innovations;

H1a: ESG performance has a positive impact on the quality of green technology innovation.

3.2 ESG performance, digital transformation and green technology innovation

In the context of China's "Dual Carbon" strategy and the digital economy era, how enterprises can achieve deep integration between sustainable development and digital transformation has become a key focus in both academic and practical circles. Recent studies have increasingly demonstrated that corporate environmental, social, and governance (ESG) performance significantly drives digital transformation.

H2a: ESG performance can promote the number of green technology innovation of enterprises through digital transformation;

H2b: ESG performance can promote the quality of green technology innovation in enterprises through digital transformation;

3.3ESG performance, media attention and green technology innovation

From the perspective of signaling theory, ESG performance serves as a credible and verifiable positive signal. This mechanism not only reduces information asymmetry between enterprises and their external environment but also enhances media attention and social image, thereby attracting more positive coverage. This demonstrates that ESG is not merely a tool for corporate social responsibility, but a strategic instrument for securing media resources and public support in the information age. Based on this analysis, we propose the following hypotheses:

H3a: ESG performance can promote the number of green technology innovation of enterprises through media attention;

H3b: ESG performance can promote the quality of green technology innovation of enterprises through media attention;

4.research design

4.1 Model setting and variable selection

4.1.1 model specification

In order to test the research hypotheses H1a and H1b, this paper sets up the following model:

$$GIZ_{i,\ t}=\alpha_0+\beta_1 ESG+\sum\gamma X_{i,j,t}+\mu_i+\omega_t+\varepsilon_{i,t} \quad （1）$$

$$GIS_{i,\ t}=\alpha_0+\beta_1 ESG+\sum\gamma X_{i,j,t}+\mu_i+\omega_t+\varepsilon_{i,t} \quad （2）$$

$$DCG_{i,\ t}=\alpha_0+\beta_1 ESG+\sum\gamma X_{i,j,t}+\mu_i+\omega_t+\varepsilon_{i,t} \quad （3）$$

$$Media_{i,\ t}=\alpha_0+\beta_1 ESG+\sum\gamma X_{i,j,t}+\mu_i+\omega_t+\varepsilon_{i,t} \quad （4）$$

In the model, $GIZ_{i,\ t}$ denotes the quality of green technology innovation, and $GIZ_{i,\ t}$ represents the quantity of green technology innovation. μ_i and ω_t respectively denote unobservable individual fixed effects and time fixed effects, while represents the random disturbance term. Model (1) is used to test Hypothesis H1a, Model (2) for Hypothesis H1b, and Model (3) for Hypotheses H2a and H2b. Model (4) is employed to test Hypotheses H3a and H3b. To reduce omitted variable bias, control variables are also included in the model.

4.2 variable selection

4.2.1 The explained variable: green innovation

The quantity of green technology innovations in enterprises (GIS). Drawing on the method of Li Wenjing and Zheng Manni (2016), the quantity of green innovations is measured by the number of green utility model patent applications with lower technical difficulty and lower patent technical level; the quality of green innovations is measured by the number of green

invention patent applications with the highest technical difficulty and the most complex patent technical level. Patent data are sourced from the China National Research Data Service Platform (CNRDS), and green patents are classified and identified according to the International Patent Classification Green List. Considering the right-skewed distribution characteristics of patent data, this paper applies a log-1 transformation to the number of green patent applications, to reduce data skewness and improve the accuracy and robustness of statistical analysis.

Green Innovation Quality (GIZ) of Enterprises. The Green Innovation Quality (GIZ) of Enterprises focuses more on the quality and practical value of corporate green technological innovations, aiming to evaluate the technical depth and innovation level of enterprises' green technological achievements. Following the approach of Li Wenjing and Zheng Manni (2016), GIZ specifically adopts the number of green invention patent applications as a measurement indicator. As invention patents typically represent higher levels of innovation and technological breakthroughs, selecting this metric better reflects the quality of corporate green innovations. Similarly, this study applies a logarithmic transformation with a +1 adjustment to the number of green invention patent applications.

4.2.2 Explanatory variable: ESG rating

According to previous studies, the Huazheng ESG rating combines mainstream international ESG evaluation perspectives with China's practical context, measuring corporate environmental responsibility, social responsibility, and corporate governance through 14 entities and 26 key indicators. It covers all listed companies with good data continuity and availability. Therefore, this paper adopts the Huazheng ESG rating as the measurement method for explanatory variables. The Huazheng ESG rating is divided into nine tiers: C, CC, CCC, B, BB, BBB, A, AA, and AAA. For empirical research and scholarly studies, scholars assign scores from 1 to 9 to measure the nine-tier C-AAA rating system. Higher scores indicate higher ESG ratings, reflecting better performance in environmental, social, and corporate governance aspects, and vice versa.

4.2.3 Mediating variables

Digital Transformation (DCG): This study draws on scholarly research and employs text analysis of corporate annual reports. Through CNRDS 'AKRD database, we conducted term frequency statistics for digital transformation-related keywords in listed companies' annual reports. The processed data from 2011 to 2022 was then analyzed by calculating logarithms of the adjusted term frequencies to measure corporate digital transformation.

Media Focus (Media): Existing literature measures media attention primarily through the number of news reports related to enterprises obtained via internet news search engines. This paper uses the total number of media coverage titles from quantitative statistics of newspaper and financial news and online news in China's research data service platform to measure the intensity of media attention received by heavily polluting enterprises.

4.3 Data sources and sample selection

This study conducts empirical analysis using data from Shanghai and Shenzhen A-share listed companies between 2010 and 2024. To ensure validity, we applied the following data processing principles: (1) Removing companies marked with ST or PT status; (2) Eliminating samples with missing data; (3) Excluding companies with less than one year of listing history; (4) Removing financial industry enterprises; (5) Filtering out insolvent companies; (6) Applying 1% and 99% trimming to all continuous variables to eliminate outliers. The final dataset comprises 18,057 valid observations.

Table 1 Descriptive statistics

Variable	N	Mean	SD	Min	Max
GIZ	18057	0.340	0.760	0	6.480
GIS	18057	0.610	0.990	0	6.210
ESG	18057	4.120	0.960	1	9.000
DCG	18057	1.170	1.270	0	4.960
Media	18057	3.740	1.820	0	14.19
Size	18057	22.82	1.410	19.88	26.71
Lev	18057	0.500	0.200	0.0700	0.930

Variable	N	Mean	SD	Min	Max
ATO	18057	0.680	0.500	0.0600	2.930
Cap1	18057	14.70	1.080	12.04	17.96
Growth	18057	0.140	0.400	-0.580	2.680
ROE	18057	0.0600	0.130	-0.680	0.390

Table 1 presents the descriptive statistics of key variables, with all continuous variables having undergone a 1% trimming. The Lev mean value is 0.5, though some companies exhibit an asset-liability ratio as high as 0.93. The ESG rating average stands at 4.12, with the highest value reaching 9. The mean values for the dependent variables—green technology innovation quantity and quality—are 0.34 and 0.61, respectively.

5.Empirical results and analysis

5.1 Results of benchmark regression

Regression analysis of the benchmark model using Stata 16.0 yielded results shown in Table 2. The findings indicate that: In Column (1), the regression coefficient of ESG rating on overall green innovation quality (GIZ) is 0.123, which is statistically significant at the 1% level, demonstrating that ESG rating significantly promotes corporate green innovation quality. Similarly, in Column (2), the coefficient for ESG rating on green innovation quantity (GIS) is 0.103, also significant at the 1% level, confirming that ESG rating substantially enhances the quantity of green innovation activities. These results validate Hypotheses H1a and H1b proposed in this study.

Table 2 Benchmark regression

	(1)	(2)
	GIZ	GIS
ESG	0.041***	0.026***
	(4.745)	(2.607)
Size	0.170***	0.260***
	(7.570)	(9.893)
Lev	-0.020	-0.134*
	(-0.348)	(-1.655)
ATO	-0.032	0.053
	(-1.018)	(1.394)
Cap1	-0.026**	-0.059***
	(-2.063)	(-3.838)
Growth	-0.033***	-0.022*
	(-3.438)	(-1.716)
ROE	-0.086*	-0.011
	(-1.880)	(-0.180)
_cons	-3.402***	-4.726***
	(-7.466)	(-8.418)
N	18057	18057
r2	0.180	0.196
r2_a	0.179	0.195

t statistics in parentheses

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

(1)Analysis of mediation effects

Regression of mediating effects in Table 3

	(4)	(4)
	DCG	**Media**
ESGmean	0.039***	0.020*
	(3.612)	(1.868)
Size	0.249***	0.184***
	(9.217)	(7.318)
Lev	-0.217**	-0.008
	(-2.076)	(-0.085)
ATO	0.112**	0.038
	(2.524)	(0.881)
Cap1	-0.026	-0.029
	(-1.255)	(-1.643)
Growth	0.007	0.025
	(0.470)	(1.472)
ROE	-0.047	0.329***
	(-0.634)	(4.936)
_cons	-4.902***	-0.160
	(-7.912)	(-0.295)
N	18057	18057
r2	0.364	0.780
r2_a	0.363	0.780

t statistics in parentheses

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

This study employs the two-step method proposed by Jiang Ting (2022) to examine mediating effects. Using Stata 16.0 for regression analysis of digital transformation and media attention as mediating variables, the results are presented in Table 3. The F-values in all models remain statistically significant at the 1% level. Column (2) shows that ESG ratings significantly increase analyst attention (regression coefficient: 0.039 at the 1% level), confirming Hypotheses H2 and H3. Column (3) demonstrates that ESG performance positively correlates with media attention (regression coefficient: 0.02), further validating these hypotheses.

5.2 Robustness test

Replacement of explanatory variables

An alternative measurement method for constructing ESG1 was developed. Specifically, enterprises with an ESG rating of C-CCC receive a score of 1, those rated B-BBB receive 2, and those rated A-AAA receive 3. After implementing this revised measurement approach for explanatory variables, regression analysis of the sample data revealed that the updated results largely align with previous findings. This validation demonstrates the robustness of the study's conclusions.

Table 4 Replacement of explanatory variables

	(1)	(2)
	GIZ	GIS
ESG1	0.037***	0.025***
	(4.825)	(2.794)
Size	0.171***	0.260***
	(7.613)	(9.904)
Lev	-0.021	-0.134*
	(-0.372)	(-1.655)
ATO	-0.033	0.053
	(-1.033)	(1.385)
Cap1	-0.027**	-0.059***
	(-2.075)	(-3.845)
Growth	-0.033***	-0.022*
	(-3.447)	(-1.714)
ROE	-0.087*	-0.011
	(-1.886)	(-0.186)
_cons	-3.397***	-4.718***
	(-7.449)	(-8.403)
N	18057	18057
r2	0.179	0.196
r2_a	0.179	0.195

t statistics in parentheses

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

5.3 Elimination of extreme values

The method of removing extreme values is selected for robustness test in this paper. The specific test results are shown in Table 1. It can be seen that the regression coefficients in column (1) and column (2) correspond to the benchmark regression test results, so H1a and H1b can be further verified.

Table 5 Removal of extreme values

	(1)	(2)
	GIZ	GIS
ESG	0.042***	0.029***
	(4.709)	(2.743)
Size	0.165***	0.264***
	(7.515)	(9.896)
Lev	-0.016	-0.158*
	(-0.275)	(-1.935)
ATO	-0.030	0.051
	(-0.962)	(1.351)
Cap1	-0.026**	-0.066***

	(1)	(2)
	GIZ	**GIS**
	(-2.033)	(-4.206)
Growth	-0.031***	-0.021
	(-3.228)	(-1.571)
ROE	-0.083*	-0.012
	(-1.819)	(-0.195)
_cons	-3.313***	-4.709***
	(-7.265)	(-8.359)
N	17756	17756
r2	0.173	0.197
r2_a	0.172	0.196

t statistics in parentheses

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

5.4 Heterogeneity analysis

5.4.1 The influence of property right nature on ESG value effect

First, the nature of ownership rights influences the motivations behind corporate ESG performance. As relatively pure market participants, non-state-owned enterprises primarily aim to achieve economic returns when enhancing ESG practices. In contrast, state-owned enterprises, possessing dual identities as both market players and state regulators, prioritize institutional policies, social impact, and public sentiment over economic gains in their ESG initiatives. Consequently, the focus of ESG practices differs between enterprises with different ownership structures: non-state-owned firms tend to prioritize stakeholders who generate greater economic benefits, while state-owned enterprises more often engage in ESG initiatives to comply with national directives. These differences in ESG motivations and implementation patterns result in stronger value-enhancing effects for ESG investments in non-state-owned enterprises. Second, ownership structure affects how enterprises leverage ESG to secure support from stakeholders like governments and financial institutions. State-owned enterprises inherently enjoy stronger political connections, making it easier to obtain support from governments and state-owned banks. Conversely, non-state-owned enterprises lack such "kinship ties" with government entities and banks, necessitating enhanced ESG practices to gain governmental and banking backing. Therefore, for both state-owned and non-state-owned enterprises, the marginal effect of improving ESG on acquiring resources from governments and state-owned banks remains relatively low. In summary, state-owned enterprises are expected to demonstrate smaller value-enhancing effects from ESG performance. Considering the characteristics of ownership structure as a grouping variable, this study employs group regression analysis for verification, with relevant results presented in Table 6. Columns (1) and (2) present the regression results for quality groups of green technology innovation, with Column (1) representing non-state-owned enterprises and Column (2) representing state-owned enterprises. Columns (3) and (4) demonstrate the quantitative group regression results, where Column (3) and Column (4) correspond to non-state-owned enterprises and state-owned enterprises respectively. In summary, compared with non-state-owned enterprises, state-owned enterprises exhibit a smaller enhancement effect of ESG on corporate value improvement.

Table 6. Influence of property right nature on ESG value effect

	(1)	(2)	(3)	(4)
	GIZ	**GIZ**	**GIS**	**GIS**
ESG	0.040***	0.038***	0.054***	0.004
	(3.449)	(3.330)	(3.753)	(0.275)

	(1)	(2)	(3)	(4)
	GIZ	GIZ	GIS	GIS
Size	0.178***	0.171***	0.245***	0.291***
	(6.135)	(5.185)	(6.202)	(8.610)
Lev	-0.000	-0.027	-0.101	-0.138
	(-0.002)	(-0.320)	(-0.949)	(-1.166)
ATO	-0.070*	-0.005	0.012	0.086*
	(-1.740)	(-0.108)	(0.205)	(1.717)
Cap1	-0.044**	-0.014	-0.048**	-0.070***
	(-2.473)	(-0.796)	(-2.109)	(-3.444)
Growth	-0.032**	-0.038***	-0.044**	-0.013
	(-2.338)	(-2.806)	(-2.405)	(-0.720)
ROE	-0.031	-0.147**	-0.055	-0.013
	(-0.529)	(-2.233)	(-0.726)	(-0.160)
_cons	-3.257***	-3.652***	-4.563***	-5.232***
	(-5.298)	(-5.561)	(-5.470)	(-7.198)
N	7230	10827	7230	10827
r2	0.161	0.197	0.160	0.230
r2_a	0.159	0.195	0.158	0.228

t statistics in parentheses

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

5.4.2 The influence of enterprise rent-seeking on ESG value effect

In corporate governance and policy environments, rent-seeking behaviors often indicate closer relationship networks between enterprises and governments or external institutions. These enterprises exhibit the following characteristics that enhance the marginal effects of ESG performance on green technology innovation. Specifically, rent-seeking enterprises communicate frequently with governments and rely more heavily on policy resources such as green subsidies, emission reduction incentives, and green credit. When demonstrating strong ESG performance, they are more likely to be recognized by governments as "compliant" or "exemplary" enterprises, thereby securing additional external resources for green R&D and driving green technological innovation. High rent-seeking enterprises, facing greater public and regulatory scrutiny, need to leverage ESG to rebuild their reputation and legitimacy. Compared to low rent-seeking enterprises, these companies show stronger motivation to implement ESG through visible green patents and process improvements, thereby sending credible "green signals" externally and enhancing green technology innovation outputs. In summary, high rent-seeking enterprises are expected to exhibit greater value-enhancing effects through ESG performance. This study employs grouped regression analysis for verification, with results presented in Table 7. Columns (1) and (2) report grouped regression results for green technology innovation quality, where Column (1) represents low rent-seeking enterprises and Column (2) represents high rent-seeking enterprises. Columns (3) and (4) present grouped regression results for green technology innovation quantity, with Columns (3) and (4) representing low and high rent-seeking enterprises respectively. In conclusion, compared to low rent-seeking enterprises, high rent-seeking enterprises demonstrate greater value-enhancing effects of ESG improvements.

Table 7 The effect of enterprise rent-seeking on ESG value effect

	(1)	(2)	(3)	(4)
	GIZ	GIZ	GIS	GIS
ESG	0.027***	0.051***	0.003	0.053***
	(2.987)	(3.766)	(0.249)	(3.389)
Size	0.128***	0.155***	0.230***	0.214***
	(5.199)	(4.417)	(6.889)	(5.515)
Lev	-0.076	0.056	0.039	-0.294**
	(-1.209)	(0.578)	(0.431)	(-2.223)
ATO	-0.013	-0.069	0.075	0.035
	(-0.289)	(-1.492)	(1.441)	(0.629)
Cap1	-0.002	-0.029	-0.041*	-0.059***
	(-0.125)	(-1.551)	(-1.661)	(-3.064)
Growth	-0.006	-0.044***	-0.007	-0.033*
	(-0.430)	(-3.163)	(-0.362)	(-1.794)
ROE	-0.023	-0.133*	0.033	-0.056
	(-0.438)	(-1.748)	(0.422)	(-0.588)
_cons	-2.760***	-3.095***	-4.343***	-3.666***
	(-5.128)	(-4.175)	(-6.397)	(-4.423)
N	9029	9028	9029	9028
r2	0.106	0.215	0.131	0.213
r2_a	0.104	0.213	0.129	0.211

t statistics in parentheses

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

6.POLICIES AND RECOMMENDATIONS

This study empirically examines the impact of corporate ESG performance on green technology innovation using A-share listed companies in China from 2010 to 2024. The findings reveal that better ESG performance correlates with higher corporate value. Mechanism analysis demonstrates that strong ESG performance enhances digital transformation capabilities and media visibility, thereby boosting corporate value. Further analysis shows that ESG's value-enhancing effect is more pronounced in non-state-owned enterprises and firms with higher rent-seeking tendencies. Policy implications emerge from these conclusions: First, empirical results confirm that exemplary ESG performance significantly elevates corporate value, indicating ESG has become a crucial lever for enhancing core competitiveness and market recognition. Second, ESG indirectly strengthens value creation capabilities by driving digital transformation and media engagement. Third, the value-enhancing effect is particularly evident in non-state-owned enterprises and firms with stronger rent-seeking tendencies, suggesting ESG's regulatory and constraint functions are more prominent in governance-deficient or high-pressure environments. The following policy recommendations are proposed for this study: First, enterprises should proactively establish a comprehensive ESG management system, integrating environmental responsibility, social responsibility, and corporate governance into long-term strategic planning to continuously improve ESG performance and achieve steady growth in corporate value. Second, when implementing ESG strategies, companies should deepen integration with digital transformation while enhancing transparency in information disclosure and media engagement to amplify the social impact of ESG achievements and gain greater recognition in capital markets. Third, regulatory authorities should strengthen supervision and policy guidance for non-state-owned enterprises and high-rent-seeking firms, encouraging them to enhance compliance

and innovation through ESG practices. Enterprises themselves should prioritize green technology innovation and compliance governance in their ESG investments, thereby achieving dual objectives of reputation enhancement and value creation.

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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