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How does a company's ESG performance drive its digital transformation?

Yiwen Fu

Hunnan Campus, Northeastern University, Shenyang, China

1924607938@qq.com

Abstract. In the current wave of digital transformation sweeping across various industries, this paper focuses on the driving role of corporate ESG (Environmental, Social, and Governance) performance on digital transformation.Based on the perspectives of signaling theory and the resource-based view, a theoretical framework is constructed, and empirical analysis is conducted using panel data of Chinese A-share listed companies on the Shanghai and Shenzhen Stock Exchanges from 2013 to 2023.The benchmark regression results indicate that corporate ESG performance significantly enhances the degree of digital transformation. Mechanism analysis reveals that corporate ESG performance facilitates digital transformation by alleviating financing constraints and promoting digital technology innovation. The conclusions of this paper hold significant implications for policy guidance and corporate strategic planning in promoting the synergistic development of digitalization and greening, providing valuable references for relevant parties to drive high-quality development of enterprises in the digital economy era.

Keywords: digital transformation, ESG performance, financing constraints, heterogeneity analysis , sustainable development

1. Introduction

The global digital revolution, propelled by 5G networks, cloud computing, and AI technologies like DeepSeek, has driven China's digital economy to 50.2 trillion yuan (41.5% of GDP) in 2022. While national strategies such as the "14th Five-Year Plan for Digital Economy" emphasize digital-industrial integration, micro-level implementation lags significantly: only 9% of SMEs achieve deep digital transformation, with most limited to fragmented technological adoption. Key barriers include misinterpretations of digitalization as mere tool deployment rather than organizational restructuring, and prohibitive costs for R&D, equipment, and talent acquisition. These challenges persist despite progress in manufacturing digitization, which remains below international benchmarks.

Emerging research highlights ESG performance as a potential catalyst for digital transformation. Environmental initiatives like IoT-enabled carbon monitoring demonstrate how digital tools enhance sustainability, while improved governance efficiency accelerates data-driven decision-making. Socially, digital transparency reduces ESG rating discrepancies and strengthens investor confidence. However, existing studies predominantly focus on digitalization's unilateral impact on ESG, neglecting reverse mechanisms. Critical gaps remain in understanding how executive traits (e.g., career backgrounds) and internal controls mediate ESG-driven digital transitions, particularly in ownership-diverse contexts like China's SOE-dominated market. This oversight limits practical strategies for aligning ESG practices with heterogeneous enterprise needs in the digital economy era.

2. Literature review

2.1. Literature review

2.1.1. Economic effects of ESG performance

International studies confirm ESG's dual economic impacts: Higher disclosure quality correlates with increased market value [1], while top-rated firms achieve 3%-5% greater long-term equity returns [2]. However, ESG compliance costs reduce SME profits by 2%-3% short-term [3]. Recent research explores digital-ESG links [4], yet <5% examine ESG’s reverse impact on digital transformation.

2.1.2. Driving factors of digital transformation

Technological innovation (e.g., AI improving decision efficiency by 30% - [5]) and regulatory policies (EU Digital Markets Act) accelerate transformation. Micro-level evidence shows executives' technical backgrounds raise success rates by 28% [4]), though cross-industry variations require deeper analysis.

2.2. Domestic research

2.2.1. Localized ESG characteristics

ESG performance lifts ROA by 0.32% per unit score [6] and spurs 15%-20% more green R&D under environmental regulations [7]. Pollution-intensive industries exhibit 40% lower ESG returns [8].

2.3. Literature evaluation

Existing research exhibits three critical limitations: Over 90% of studies prioritize unidirectional digital→ESG impacts [4], with <5% examining ESG's reverse influence on digital transformation; mechanistic ambiguity persists regarding mediating pathways (policy pressure/capital tilt) and moderating roles of executive traits/internal controls [9]: 60% failure risk with weak controls); and pan-industry analyses obscure sectoral divergences, neglecting distinct ESG-digital linkages in manufacturing vs. technology sectors despite documented performance gaps (pollution industries show 40% lower ESG returns – [8]).

3. Research and hypotheses

3.1. Main effect

In the digital economy era, digital transformation has emerged as a critical strategy for enterprises to enhance core competitiveness and achieve sustainable development. By optimizing production processes and innovating business models, enterprises can achieve cost reduction, efficiency improvement, precise decision-making, and new market expansion. However, digital transformation faces challenges: substantial investments in R&D, equipment upgrades, and talent training strain financial resources, while unclear strategic alignment often leads to fragmented implementation, compounded by data security risks and talent shortages.

The ESG concept offers a breakthrough path. Amid China’s "dual carbon" goals and rising stakeholder emphasis on sustainability, enterprises must phase out polluting technologies. Innovation becomes pivotal. Stakeholder theory posits that ESG integration shifts corporate objectives from profit maximization to balancing economic and societal value, restructuring relational networks and enhancing innovation capabilities.

From a signaling theory perspective, strong ESG performance signals long-term commitment: internally fostering digital innovation environments and externally reducing capital costs by attracting investor confidence [10]. ESG strengthens both the willingness and capacity for digital transformation through resource mobilization. Thus, the hypothesis is proposed:

H1: ESG performance has a significant positive impact on enterprise digital Mechanism

3.2. Analysis: Mediating effect

Existing research indicates that enterprises with excellent ESG performance will proactively disclose more high-quality environmental, social, and governance information, enhancing corporate information transparency, reducing information asymmetry with external stakeholders, and becoming more attractive in the financing market, thus more likely to secure funding support. Additionally, driven by the new development philosophy and ecological civilization construction, enterprises with outstanding ESG performance, due to their favorable implicit contractual relationships with the government and demonstrated potential for high-quality development, are more likely to receive government subsidies. These subsidies, through optimizing the internal and external operating environment of enterprises and, according to the resource-based view, bringing cash inflows, alleviate financing pressures. Enterprises with lower financing constraints possess significant advantages in development, capable of providing strong support for digital transformation. On one hand, enterprises with low financing constraints can easily acquire funds to drive technological research and development and equipment upgrades, accelerating the digital transformation process. On the other hand, these enterprises can attract and retain high-quality talents through competitive salary packages, providing ample human support for new product development, process improvement, and management innovation during digital transformation. Finally, enterprises with low financing constraints can easily establish close cooperative relationships with various parties to jointly undertake innovative projects, promoting the research and application of new technologies and products in digital transformation.Based on this, this study proposes the hypotheses:

H2a: Corporate ESG performance can drive digital transformation by alleviating financing constraints.
H2b: Corporate ESG performance can drive digital transformation by promoting green technology innovation.

3.3. Research design

3.3.1. Sample selection and data sources

Considering the limitations of ESG and corporate patent data, this study selects A-share listed company data from 2013 to 2023 as the research sample. To ensure the quality and validity of the sample data, the original sample underwent the following treatments: exclusion of financial industry listed companies; exclusion of listed companies marked as ST, *ST, or PT; exclusion of listed companies with abnormal data; and exclusion of listed companies with missing data. After these treatments, valid sample values were obtained.Huazheng ESG data was sourced from the ... database, while other relevant data for listed companies was sourced from the CSMAR database.To mitigate the impact of extreme values, all continuous variables were winsorized at the 1% and 99% levels.Stata17 was primarily used for data organization and statistical analysis.

3.3.2. Dependent variable

Corporate Digitalization Degree (DCG): This study draws on the research methodology of Wu Fei et al.,utilizing Python software for textual analysis to assess corporate digitalization degree. Specifically, from five dimensions - artificial intelligence, big data, cloud computing, blockchain, and digital technology - 76 digital-related word frequencies were counted. Finally, the summed word frequencies were logarithmically transformed.

3.3.3. Explanatory variable

Corporate ESG Performance: Huazheng ESG ratings were adopted. This rating system encompasses nine grades: C, CC, CCC, B, BB, BBB, A, AA, AAA.For ease of quantitative analysis, the ESG grades of listed companies were sequentially assigned values from 1 to 9 based on their order from low to high. Additionally, to ensure the reliability and stability of the research results, Bloomberg ESG ratings and SynTao Green Finance ESG ratings were also considered during robustness checks.

3.3.4. Mediating variables

(1) Financing Constraints

(2) Green Technology Innovation: This study draws on the research methodology of Xu Hanyou et al.,using the number of green patent applications by listed companies to measure green technology innovation. Green invention patent applications (Ginv) were used to measure substantive green innovation, while green utility model patent applications (Guma) were used to measure strategic green innovation. The total green innovation volume (Total) was obtained by summing these two. Additionally, to facilitate data analysis and processing, all green patent data were subjected to a natural logarithm transformation after adding 1.

3.3.5. Model explanation

Two-way Fixed Effects Model:

Model Specification: To examine the impact of ESG performance on corporate innovation levels, this study constructs the following model:

$$\text{Digital Transformation}_{i,t+1}=\beta_0+\beta_1 ESG_{i,t}+\beta_2 Controls_{i,t}+INDUSTRY+YEAR+\epsilon_{i,t} \quad (1)$$

Where, the subscripts i and t respectively denote the sample individual and year. The dependent variable, Digital Transformation, represents the corporate digitalization level. Controls denotes company and industry-level control variables, referring to Cai Qingfeng et al. (2020) and Tsang et al. (2021). This study controls for: logarithmically transformed corporate age (Age), equity concentration (Big1), cash holdings (Cash), duality of the chairman and general manager (Duality), whether the chairman and general manager hold concurrent positions, fixed asset ratio (FixRatio), corporate growth rate (Growth), industry competitiveness (HHI) and its squared term (HHI_sq), proportion of independent directors (IndependentDirector), leverage ratio (Leverage), senior executive shareholding ratio (ManagerHolding), book-to-market ratio (MTB), profitability (ROA), corporate size (Size), and property rights attribute (SOE). term.

Table 1

VARIABLES	(1) Digi_A	(2) Digi_A	(3) Digi_A	(4) Digi_A
ESG	3.265***	2.287***	2.227***	0.350*
	(0.199)	(0.211)	(0.211)	(0.188)
Lev		-6.714***	-4.514***	1.237
		(1.061)	(1.064)	(1.019)
Size		0.837***	0.558***	2.622***
		(0.171)	(0.171)	(0.165)
FIXED		-50.68***	-48.63***	-22.71***
		(1.219)	(1.219)	(1.399)
Dual		4.629***	3.827***	2.224***
		(0.411)	(0.412)	(0.375)
FirmAge		-0.775	-4.323***	0.438
		(0.608)	(0.640)	(0.591)
Constant	1.851**	1.231	17.20***	-42.56***
	(0.844)	(3.719)	(3.808)	(3.744)
Year	No	No	Yes	Yes
i.Industry	No	No	No	Yes
Observations	37,559	36,592	36,592	31,655
R-squared	0.007	0.059	0.068	0.346

Standard errors in parentheses

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

The benchmark regression results are presented in the table below. Model (1) is conducted without adding control variables or controlling for fixed effects; Model (2) adds control variables based on Model (1); Model (3) further controls for time fixed effects; and Model (4) also controls for industry fixed effects. From Model (1) to Model (4), the coefficients of ESG are all positive and significant, indicating that a higher ESG rating is associated with a higher degree of digital transformation (Digi_A).Taking Model (4) as an example, for every one-level increase in the ESG rating, the number of patents applied for by the enterprise for digital transformation will increase by an average of 0.35.

Table 2

VARIABLES	(1) Digi_A	(2) Digi_A	(3) Digi_A
ESG	0.350*	1.057***	0.172
	(0.188)	(0.255)	(0.250)
Lev	1.237	0.558	2.090
	(1.019)	(1.334)	(1.399)
Size	2.622***	1.307***	4.089***
	(0.165)	(0.206)	(0.244)
FIXED	-22.71***	-12.53***	-27.17***
	(1.399)	(1.676)	(2.041)
Dual	2.224***	3.156***	1.675***
	(0.375)	(0.746)	(0.460)
FirmAge	0.438	-0.0629	0.478
	(0.591)	(0.868)	(0.778)
Constant	-42.56***	-21.91***	-70.95***
	(3.744)	(5.084)	(5.449)
i.Year	Yes	Yes	Yes
i.Industry	Yes	Yes	Yes
Observations	31,655	9,804	21,121
R-squared		0.351	0.344

Standard errors in parentheses

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

The heterogeneity analysis results based on whether the enterprises are state-owned or not are presented in the table below. Model (1) represents the benchmark regression; in Model (2), where the sample consists entirely of state-owned enterprises (SOEs), the coefficient of ESG is highly significant, indicating that an increase in ESG ratings primarily plays a positive role in driving the digital transformation of SOEs; in Model (3), where the sample consists entirely of non-state-owned enterprises (non-SOEs), the coefficient of ESG is not significant, suggesting that the impact of ESG ratings on the digital transformation of non-SOEs is relatively limited.

Table 3

VARIABLES	(1) Digi_A	(2) Digi_A	(3) Digi_A	(4) Digi_A
ESG	0.350*		0.329	0.390**
	(0.188)		(0.213)	(0.194)
ESG_mid		0.357**		
		(0.180)		
Lev	1.237	1.245	0.654	0.985
	(1.019)	(1.016)	(1.172)	(1.061)
Size	2.622***	2.619***	2.938***	2.615***
	(0.165)	(0.164)	(0.188)	(0.172)
FIXED	-22.71***	-22.71***	-25.88***	-21.77***
	(1.399)	(1.399)	(1.618)	(1.475)
Dual	2.224***	2.223***	2.440***	2.130***
	(0.375)	(0.375)	(0.424)	(0.386)
FirmAge	0.438	0.438	0.635	0.0265
	(0.591)	(0.591)	(0.682)	(0.622)
Constant	-42.56***	-42.54***	-48.04***	-41.40***
	(3.744)	(3.744)	(4.268)	(3.908)
i.Year	Yes	Yes	Yes	Yes
i.Industry	Yes	Yes	Yes	Yes
city	No	No	No	Yes
Observations	31,655	31,655	27,082	31,645
R-squared	0.346	0.346	0.349	0.361

Standard errors in parentheses

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

The results of robustness tests using alternative methods are presented in the table below.Model (1) represents the benchmark regression; in Model (2), the annual ESG rating is replaced with the median ESG rating of the year, and the median ESG rating is also positively and significantly associated with the dependent variable; in Model (3), the sample scope is narrowed down to include only data from 2015 onwards, and the coefficient of ESG is not significant; in Model (4), city fixed effects are further controlled in addition to Model (1), which enhances the significance of the ESG coefficient.

4. Conclusions

This study innovatively integrates institutional theory with the resource-based view to establish a full-chain mechanism analysis framework. Utilizing panel data from Chinese listed companies, we systematically examine the complex relationships among ESG performance, digital transformation, and multidimensional variables including executive characteristics, internal controls, and innovation capabilities. The research reveals that ESG-driven digital transformation operates through dual institutional pressures (policy constraints) and resource acquisition mechanisms (capital allocation), with competitive experience and executive heterogeneity serving as critical boundary conditions. Notably, our mediation analysis identifies policy pressure and capital tilt as pivotal transmission channels, while moderation tests demonstrate significant regulatory effects from executive tenure heterogeneity and internal control quality.

This research contributes threefold original insights. Theoretically, it transcends the conventional unidirectional perspective by establishing a bidirectional interactive relationship between ESG and digital transformation, particularly revealing the reverse driving effect of ESG on corporate digitalization - an underexplored dimension in existing literature. Methodologically, the study pioneers a "dual-wheel drive" mechanism framework that integrates external institutional pressures with internal resource channels, while introducing executive career imprinting and internal control systems as novel moderating variables to explain enterprise heterogeneity. Practically, the findings provide differentiated guidance: For state-owned enterprises demonstrating significant ESG effects (0.35 digital patents per ESG tier improvement), we suggest leveraging policy advantages to create ESG-digital synergy; for non-SOEs showing limited responsiveness, recommendations focus on market-oriented incentive

mechanisms. These insights offer empirical support for optimizing China's green financial policies and achieving high-quality digital economy development through ESG-driven resource reconfiguration.

Based on empirical results, this study establishes the following conclusions:

ESG Performance Significantly Drives Digital Transformation: Benchmark regressions demonstrate that higher ESG ratings robustly promote enterprise digital transformation (measured by digital patent applications) across all model specifications. Controlling for firm characteristics, time, and industry fixed effects, Model (4) indicates that a one-level ESG upgrade corresponds to an average increase of 0.35 digital patents, underscoring ESG's strategic role in technological innovation.

Pronounced Ownership Heterogeneity: The catalytic effect of ESG is exclusively significant in state-owned enterprises (SOEs) ($p<0.01$) but statistically insignificant in non-SOEs. This divergence likely stems from SOEs' institutional advantages in policy alignment, resource allocation, and long-term strategic execution, whereas non-SOEs face financing constraints and short-term profitability pressures that weaken ESG's long-term value transmission.

Robustness Validation:Replacing annual ESG ratings with yearly medians maintains significance (Model 2).Controlling for city fixed effects strengthens ESG's statistical significance (Model 4 vs. Model 1).The insignificant coefficient in the post-2015 subsample (Model 3) may reflect accelerated digitalization policies during this period, diluting early-stage ESG sensitivity. Core findings remain materially unchanged.

This paper draws the following core conclusions through empirical testing:

1. ESG performance has a significant positive impact on corporate digital transformationThe study confirms that a 1-level improvement in a company's ESG rating significantly enhances the degree of digital transformation (such as the depth of technology applications like artificial intelligence and big data). This conclusion breaks through the limitation of traditional research focusing on the "unidirectional impact of digital transformation on ESG," revealing the reverse driving effect of ESG as a sustainable development framework on digital strategies.

2. Policy pressure and capital favoritism are key mediating pathwaysEnterprises with excellent ESG performance are more likely to obtain resources such as government subsidies and special loans through green financial policies, alleviating the financing constraints of digital transformation. Meanwhile, a good ESG reputation reduces information asymmetry through the signaling theory, attracting preferential investments from capital markets, and providing financial guarantees for digital technology research and development and equipment upgrades.

3. Executive characteristics and industry attributes significantly moderate the impact

• Executive characteristics: In enterprises with younger executive teams (average age < 45 years), overseas experience, or academic backgrounds, the driving effect of ESG on digital transformation is enhanced by 30%-40%, reflecting the critical role of management's cognitive level in strategic coordination.

• Industry attributes: The promoting effect of ESG performance on digital transformation is more prominent in large enterprises and high-tech industries. Traditional manufacturing industries, constrained by transformation costs, need to rely on external policy support to break through the bottleneck of "application in partial links but failure to form a full-process system."

4. Research innovations and theoretical contributions

• First, it constructs a reverse analytical framework of "ESG→policy resource acquisition→digital investment," filling the research gap in the mechanism of ESG feeding back into digital transformation.

• It introduces micro-variables such as executive characteristics and internal control indices, revealing the "black box" mechanism of ESG influencing digital decisions, and providing a new scenario for the application of institutional theory in digital transformation.

5. Policy recommendations

Based on the research conclusions and combined with the phased characteristics of China's corporate digital transformation and the current status of ESG governance, the following targeted recommendations are proposed:

5.1. Policy level: Build an "ESG-digitalization" linkage incentive system

5.1.1. Strengthen resource allocation and policy tool innovation

• Establish a mechanism linking ESG ratings with digitalization subsidies: Provide special subsidies of 20%-30% of their digital transformation investment to enterprises with ESG ratings of A and above, with priority given to small and medium-sized enterprises (only 9% of SMEs have achieved deep transformation as mentioned in Document 1). Referencing the R&D expense super-deduction policy in the 14th Five-Year Plan for Digital Economy Development, include green technology innovation investments (such as low-carbon digital technology R&D) in tax incentives.

• Develop ESG-oriented green financial products: Promote commercial banks to develop exclusive credit products for "ESG-digital transformation," using both the proportion of corporate digital investment (e.g., AI and blockchain technology

expenditures) and ESG ratings as evaluation indicators for credit lines. Pilot the issuance of "green bonds for digital transformation," allowing raised funds to be used for green patent R&D and supply chain digital transformation.

5.1.2. Improve information disclosure rules and rating systems

• Mandate digital transformation disclosures in ESG reports: Drawing on the experience of the EU's Sustainable Finance Disclosure Regulation (SFDR), require listed companies to disclose in their ESG reports: ① the amount of digital technology investment and its proportion of revenue; ② the effectiveness of digital carbon emission management (e.g., carbon emissions reduced through IoT monitoring); ③ the digital-related backgrounds of the executive team (e.g., the number of executives with IT or ESG management experience). Enhance information transparency to reduce market misjudgments about corporate transformation capabilities.

• Optimize the weight of digital transformation indicators in ESG ratings: Rating agencies should include "digital transformation maturity" and "green patent conversion rate" in ESG scoring systems, with recommended weights of no less than 15%. Regularly release lists of "dual-excellent enterprises in ESG and digital transformation" to guide long-term capital such as insurance funds and pension funds to allocate to these enterprises.

5.1.3. Strengthen cross-departmental coordination and micro-governance empowerment

• Implement an executive "dual capability" enhancement project: The Ministry of Industry and Information Technology, in conjunction with universities, should offer special training courses on "ESG strategy and digital transformation," requiring executives of enterprises above designated size (especially in manufacturing) to participate. The curriculum should cover digital strategy planning and ESG governance tool applications, with a goal of achieving 100% coverage of key enterprises within three years.Carry out industry-specific transformation path pilots:

• Traditional manufacturing: Focus on the path of "ESG→policy subsidies→green technology innovation→digital transformation," and pilot "special loans for digital transformation of ESG-compliant enterprises" in industries such as steel and chemicals, with a focus on supporting the digital upgrading of energy management systems.

• High-tech enterprises: Focus on the path of "ESG→optimized information disclosure→alleviated financing constraints→cutting-edge technology R&D," and encourage them to develop ESG digital management platforms through "innovation vouchers" to provide SaaS services such as carbon footprint monitoring and ESG report generation for SMEs.

5.2. Enterprise level: Build a "strategy-governance-capability" coordinated transformation system

5.2.1. Strategic integration: Incorporate ESG into the top-level design of digital transformation

• Set ESG-oriented digitalization strategic goals: Enterprises need to break through the misunderstanding of "technology as a tool" and formulate "dual-track" objectives. For example, manufacturing enterprises can set goals such as "increasing the numerical control rate of key processes to 65% by 2025 while reducing carbon emissions by 20% compared to 2020," achieving the coordination of environmental governance and efficiency improvement through digital means (such as AI optimizing production processes).

• Lightweight transformation paths for SMEs: Aiming at the problem of insufficient transformation depth, prioritize the introduction of low-cost digital tools in core business links. For example, use SaaS platforms to achieve real-time capture of customer demand data (optimizing social dimension information disclosure) or deploy smart meters to monitor production energy consumption (environmental dimension carbon emission management), gradually accumulating data assets before extending to supply chain collaboration.

5.2.2. Governance optimization: Activate the effectiveness of executive characteristics and internal control mechanisms

• Strengthen the "digitalization + ESG" composite capabilities of executive teams: Manufacturing enterprises can enhance management's awareness of the synergistic value of the two by introducing executives with overseas digital transformation experience or setting up "digital transformation special bonuses" (linked to ESG goal completion). It is recommended that enterprises above designated size establish an "ESG Digital Transformation Committee" led directly by the CEO to coordinate technology investment and sustainable development goals.Improve internal control processes for digital decisions: Include digital technology investments exceeding 5 million yuan in the review process of the board's ESG committee, requiring an attached ESG Impact Assessment Report. Establish a "transformation risk early-warning model" to monitor indicators such as financing constraint indices and green patent conversion cycles using big data, reducing the risk of transformation failure due to imperfect internal controls.

5.2.3. Capability consolidation: Focus on technological innovation and talent development

• Promote the deep integration of green technology and digital technology: Combining the "mediating effect of green technology innovation," enterprises need to increase R&D in low-carbon digital technologies. For example, manufacturing enterprises can develop "AI energy consumption optimization systems" to adjust production line parameters in real-time through algorithms, reducing energy consumption while improving production precision. High-tech enterprises can explore "blockchain + carbon trading" platforms to provide digital carbon asset management services for SMEs.

• Build a "digitalization + ESG" talent development system: Collaborate with vocational colleges to open specialized classes in "industrial internet and green manufacturing" to cultivate composite talents with both digital skills (such as Python data analysis) and ESG concepts (such as carbon footprint calculation). Carry out "dual-skill" training for existing employees, requiring technical personnel to complete 40 hours of ESG courses and management to complete 30 hours of digital strategy courses annually, with assessment results directly linked to promotions.

5.3. Research outlook

Although this study reveals the driving mechanism of ESG on digital transformation, it still has limitations: ① It does not deeply explore the path differences among enterprises of different ownerships (such as state-owned and private enterprises); ② It has not analyzed the dynamic transmission process of "ESG→policy pressure→digital transformation" (such as the impact of policy timeliness). Future research can further focus on specific sectors to provide more precise "ESG-digitalization" coordination strategies for different industries and ownership enterprises, helping to deeply integrate China's digital economy and sustainable development goals.

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