

Article

Research on the Impact of Digital Transformation Information Disclosure on Corporate Sustainability Performance: An Analysis Based on Moderated Mediation Effect Model

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Abstract

Digital transformation is a key initiative to promote corporate sustainability. However, in the absence of unified information disclosure standards and effective verification mechanisms, the digital transformation information disclosed by firms may not fully reflect their actual progress in transformation. This paper focuses on the relative discrepancy between the digital transformation information disclosed by firms and their actual level of digital transformation. It constructs a catering index for information disclosure using China's A-share listed companies from 2015 to 2024 and empirically examines the impact of this disclosure and related catering behavior on corporate sustainability performance. The study finds that digital transformation information disclosure (DIG) significantly enhances corporate sustainability performance (CSP), with green collaborative innovation (GCO) partially mediating this effect. Catering behavior (Cater) negatively moderates the relationship between digital transformation information disclosure and corporate sustainability performance and weakens the mediating effect of green collaborative innovation. Heterogeneity analysis shows that the negative moderating effect of catering behavior (Cater) is more pronounced in non-state-owned enterprises, small-sized enterprises, industries with low environmental sensitivity, and low competitive industries. This study provides a basis for identifying the consistency between corporate digital transformation disclosure and actual transformation progress and offers valuable references for standardizing disclosure practices, promoting green collaborative development, and enhancing corporate sustainability performance.

Keywords: digital transformation information disclosure; catering behavior; corporate sustainability performance; green collaborative innovation; moderated mediation effect

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1. Introduction

In recent years, the global policy framework for sustainable development has been continuously improved. The 2030 Agenda for Sustainable Development, adopted by the United Nations, establishes 17 Sustainable Development Goals (SDGs) covering the three dimensions of economy, society, and environment, and calls for coordinated efforts by governments, enterprises, and social organizations. As core actors in resource allocation and value creation, enterprises have made corporate sustainability performance an important micro-level indicator for measuring progress in global sustainable development

[1]. At the same time, the rapid iteration of digital technologies provides new technological pathways for enterprises to improve resource utilization efficiency, optimize governance structures, and fulfill environmental and social responsibilities. Digital transformation has therefore gradually become an important means of promoting corporate sustainability [2,3].

In China, high-quality development has become the core proposition of the new era. The report of the 20th National Congress of the Communist Party of China clearly states the need to “promote green development and enhance the harmony between humanity and nature”, and takes “accelerating the development of the digital economy” as an important part of building a modern industrial system [4]. In 2023, the Central Committee of the Communist Party of China and the State Council issued the Overall Layout Plan for Building a Digital China, explicitly proposing to “build a fair and standardized digital governance ecosystem” and requiring “promoting deep integration of digital technology and the real economy” [5]. In this context, the progress of corporate digital transformation has attracted considerable attention from capital markets and regulatory authorities. DIG has become an important basis for external parties to evaluate their technological strength, strategic orientation, and long-term development potential [6].

However, digital transformation is characterized by long investment cycles, implementation difficulties, and uncertain outcomes. In this context, disclosed information on digital transformation may not fully reflect firms’ actual progress in transformation. Without a unified disclosure framework and verification mechanism, such disclosure may be shaped by external market evaluations, financing needs, and policy attention, giving rise to inconsistencies between firms’ digital narratives and their actual transformation practices. Following existing research [7], this study defines the significant discrepancy between the digital transformation information disclosed by enterprises and their actual transformation level as catering behavior in digital transformation information disclosure. In recent years, the U.S. Securities and Exchange Commission (SEC) has expressed concern about listed firms overstating their use of artificial intelligence and has taken regulatory action in response [8]. The International Organization of Securities Commissions (IOSCO) has also called for strengthened supervision of digital-related disclosure [9]. This indicates that the consistency and verifiability of digital transformation disclosure relative to actual progress in transformation have become important issues in capital market governance. So, does DIG affect CSP, and if so, how? What role does Cater play in this process? These are the core questions this paper seeks to answer.

Existing studies have provided relatively rich evidence on the relationship between corporate information disclosure and corporate sustainability performance. Research on general information disclosure suggests that signaling theory and principal-agent theory provide a basic framework for understanding management’s disclosure motives. Disclosure of financial and non-financial information can alleviate information asymmetry, improve the external financing environment, and enhance capital market efficiency [10–12], while management also engages in strategic behaviors such as impression management and selective disclosure [13,14]. With the development of the digital economy, research on information disclosure has gradually extended into the field of digital transformation. Existing studies show that truthful disclosure of information about digital transformation helps reduce information asymmetry and improve capital market performance [15,16]. However, some enterprises may also engage in catering disclosure phenomena, such as “concept speculation” and “much talk but little action” [7,17], due to financing constraints, short-term performance pressure, or external attention. Such catering disclosure may impair analyst forecast accuracy and increase the likelihood of information disclosure violations [18,19]. Turning to sustainability performance, existing research has been conducted from two levels: internal factors such as executive cognition, green innovation, and cor-

porate governance [20–22], and external environmental factors such as environmental regulations, green credit, and market competition [23–25], confirming that green technology innovation and green management innovation have a positive impact on sustainability performance [26,27]. In recent years, some studies have further examined the enabling role of digital transformation in sustainable development, suggesting that it can enhance corporate sustainability capabilities by alleviating financing constraints, optimizing resource allocation [28,29], and promoting collaborative innovation [30].

Although existing studies provide an important foundation for this research, there remains room for further extension. First, studies on DIG have mainly focused on capital market reactions, operational efficiency, or traditional financial performance, while insufficient attention has been paid to whether such disclosure can improve CSP as a comprehensive value indicator. Second, although existing studies on impression management and greenwashing have examined firms' strategic disclosure behavior, they do not fully explain catering behavior in DIG. Impression management research mainly focuses on rhetorical strategies and selective presentation, while greenwashing research emphasizes inconsistencies between environmental claims and actual environmental performance. In contrast, relatively little is known about whether firms' digital transformation disclosures are consistent with their actual progress in transformation, and how such catering behavior affects CSP. This provides an important research gap for this study. Third, green collaborative innovation is an important bridge between technological innovation and sustainable development [31]. However, existing studies have not sufficiently explored how DIG affects CSP through GCO. Fourth, most research treats Cater as a homogeneous strategy, failing to analyze heterogeneity in effects across different internal and external constraints. Notably, within China, how factors such as ownership type, enterprise size, and industry environment affect digital transformation disclosure strategies warrants further investigation.

In view of this, based on data from China's A-share listed companies from 2015 to 2024, this paper empirically examines the impact and mechanism of digital transformation information disclosure and the catering behavior therein on corporate sustainability performance. The research value of this paper is mainly reflected in the following aspects: First, it constructs a catering index for DIG, providing an operational measure for identifying catering tendencies in corporate digital transformation disclosure. Second, this study introduces green collaborative innovation as an external cooperation variable and reveals the collaborative innovation pathway through which DIG affects CSP, thereby extending research on the economic consequences of DIG. Third, drawing on the two dimensions of corporate internal characteristics and the external environment, this paper systematically examines the heterogeneity in the effects of catering behavior, providing empirical evidence to understand differences in the effects of digital disclosure across contexts.

2. Theoretical Analysis and Hypothesis Construction

2.1. *The Direct Impact of DIG on CSP*

Corporate sustainability encompasses multiple dimensions, including economic performance, environmental responsibility, and social value [32]. Its realization depends not only on the efficiency of firms' internal resource allocation, but also on the trust and resource support of external stakeholders. However, information asymmetry in capital markets may prevent external investors, suppliers, customers, and partners from accurately assessing firms' true capabilities, thereby creating obstacles to resource acquisition and value realization. Signaling theory suggests that voluntary information disclosure can convey signals about firms' intrinsic quality, strategic orientation, and governance capability to external parties, thereby alleviating information asymmetry and improving the efficiency of resource allocation [33].

In the digital economy era, DIG has become an important channel for firms to demonstrate their digital capabilities and strategic orientation toward transformation [34,35]. Relatively sufficient disclosure of digital strategies, technological application scenarios, business process optimization, and transformation outcomes in annual reports can help external stakeholders gain a more comprehensive understanding of firms' digital foundations and future development potential [36]. For investors, DIG can reduce uncertainty about firms' technological capabilities and long-term value [37]. For suppliers, customers, and potential partners, DIG can also send positive signals that firms prioritize technological upgrading, standardized governance, and strategic transformation, thereby strengthening their assessment of firms' capacity for sustainable development [38].

Furthermore, implementing sustainable development projects requires long-term, stable investment in resources. The trust foundation and information transparency established by DIG can help enterprises obtain multifaceted support from capital markets, policy departments, and the public. When enterprises clearly demonstrate their digital transformation process, external stakeholders are more likely to associate it with the long-term goals of sustainable development, thereby tilting their resource allocation and market recognition in favor of the enterprises [39]. Therefore, the higher the degree of DIG, the more likely enterprises are to secure the resources and support needed to promote sustainable development, thereby enhancing their overall performance across the economic, environmental, and social dimensions. Based on the above analysis, this paper proposes the following hypothesis:

H1. *Digital transformation information disclosure can promote corporate sustainability performance.*

2.2. The Mechanism of DIG on CSP

If DIG can promote CSP, through what pathway is this effect achieved? Collaborative innovation theory suggests that firms can integrate external knowledge, technologies, and resources through cross-organizational cooperation, thereby reducing innovation risks and improving the efficiency of translating innovation outcomes into value [40]. GCO refers to green technology research and development activities jointly carried out by enterprises in cooperation with universities, research institutions, or other enterprises [41]. Compared with internal closed innovation, GCO can integrate multiple knowledge resources, distribute research and development risks, and shorten the cycle from green technology development to application [42]. Related studies have confirmed that GCO can significantly improve enterprises' resource utilization efficiency, pollution control levels, and social responsibility performance, therefore serving as an important bridge between corporate behavior and sustainability performance [43,44].

However, the realization of GCO faces a core obstacle, namely information asymmetry and lack of trust among the cooperating parties. Before deciding whether to participate in joint research and development, potential partners need to carefully assess the enterprise's technological strength, willingness to cooperate, and ability to perform. In the absence of reliable information, cooperation is often difficult to initiate. Enterprises that systematically disclose their digital systems, technology application scenarios, talent reserves, and transformation achievements through annual reports, social responsibility reports, and other channels can provide external partners with a verifiable information base [45], thereby effectively overcoming the above obstacles. Such information disclosure behavior conveys a positive signal to the outside world that the enterprise is well-governed and values long-term cooperation, thereby considerably reducing pre-cooperation evaluation costs and enhancing partners' confidence in the enterprise's capabilities [46].

Once partners form a positive view of the enterprise's digital capabilities, the two parties can more easily reach a joint research and development agreement and invest resources to pursue breakthroughs in green technology. The patents, technical standards, or production process improvements generated by green collaborative innovation will ultimately translate into energy savings, reductions in pollutant emissions, and improvements in employee and social welfare for the enterprise, thereby promoting overall sustainability performance [47,48]. Accordingly, this paper proposes the following hypothesis:

H2. *Digital transformation information disclosure empowers corporate sustainability by promoting green collaborative innovation.*

2.3. The Moderating Effect of Cater

The above theoretical analysis implies an important premise that the information disclosed by enterprises can be sufficiently informative and credible. Due to the characteristics of high investment, long cycles, and high risk associated with digital transformation, many enterprises face insufficient capabilities or resource shortages during their actual transformation. As a result, a significant discrepancy may exist between the digital transformation information disclosed by firms and their actual level of transformation [49,50]. Referring to existing research, this paper defines such a discrepancy as catering behavior in digital transformation information disclosure [7]. According to principal-agent theory, management, driven by considerations of compensation contracts and short-term performance evaluations, tends to choose behaviors that can quickly increase market valuation rather than investments in long-term value [51]. When capital markets assign high premiums to digital concepts and policy resources are tilted toward digital enterprises, management may have stronger incentives to emphasize narratives of digital transformation [7]. In this context, the disclosed information about digital transformation may become less aligned with the firm's actual level of transformation. Once catering behavior exists, the aforementioned theoretical chain based on information content and signal credibility will be systematically undermined, and this disturbance manifests itself at both the direct and indirect levels.

First, Cater directly weakens the positive promotional effect of DIG on CSP. Signaling theory relies on signals being truthful and reliable. When digital transformation disclosures are not sufficiently supported by actual transformation, trust in disclosed content declines, and genuine signals become less effective [52]. Enterprises with real digital capabilities struggle to stand out, and resources may go to those skilled at appearances instead of actual transformation [53]. To maintain a positive digital transformation narrative, enterprises divert resources from research and development to superficial publicity and public relations, reducing internal resource efficiency [54]. If catering behavior is exposed by auditors, the media, or regulators, enterprises face reputational pressure and a higher risk of information quality that directly hinders sustainable development.

Second, Cater exerts an indirect effect by weakening the mediating pathway of GCO. As mentioned earlier, the successful realization of GCO depends heavily on the trust relationship among the cooperating parties, and establishing trust requires enterprises to provide truthful and consistent information [55]. When enterprises engage in catering behavior, the digital information they disclose is inconsistent with their actual capabilities, and potential partners may face greater uncertainty in assessing the firm's actual capabilities. Once partners determine that the enterprise's words and actions are inconsistent, they will question its technological strength and capabilities, resource commitment, and reliability in cooperation [56], thereby reducing knowledge sharing or even their willingness to engage in further cooperation. That is, Cater weakens the positive promotion of DIG on GCO. Weakening the first half of the mediating pathway will propagate through

the entire chain, resulting in an overall reduction in the indirect effect of GCO on CSP. Based on the above analysis, this paper proposes the following hypotheses:

H3. *Cater negatively moderates the relationship between DIG and CSP.*

H4. *Cater moderates the mediating effect of GCO in the relationship between DIG and CSP.*

Figure 1 presents the theoretical model of this study.

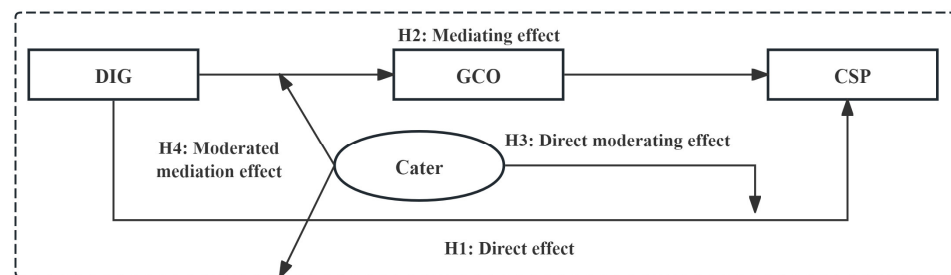


Figure 1. Theoretical model.

3. Research Design

3.1. Model Setting

3.1.1. Benchmark Model

To test Hypothesis 1 and investigate the direct impact of DIG on CSP, the following benchmark fixed effects model is constructed:

$$CSP_{i,t} = \alpha_0 + \alpha_1 DIG_{i,t} + \alpha_2 Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (1)$$

where subscripts i , t and j denote firm, year, and industry, respectively. $CSP_{i,t}$ denotes the sustainable development performance of firm i in year t . $DIG_{i,t}$ measures the extent of digital transformation information disclosure of firm i in year t . $Controls_{i,t}$ denotes the set of the control variables, μ_j denotes the industry fixed effect, v_t denotes the year fixed effect, and $\varepsilon_{i,t}$ is the error term.

3.1.2. Mediation Effect Model

To test Hypothesis 2 and determine whether DIG enhances CSP through GCO, this paper refers to Baron and Kenny's [57] causal stepwise regression method and constructs the following mediation effect testing model based on Model (1):

$$GCO_{i,t} = \beta_0 + \beta_1 DIG_{i,t} + \beta_2 Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (2)$$

$$CSP_{i,t} = \gamma_0 + \gamma_1 DIG_{i,t} + \gamma_2 GCO_{i,t} + \gamma_3 Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (3)$$

where $GCO_{i,t}$ denotes the green collaborative innovation level of firm i in year t , while other variables are defined consistently with the benchmark model.

3.1.3. Moderation Effect Model

To test Hypothesis 3 and explore whether Cater moderates the relationship between DIG and CSP, the following moderation effect model is constructed:

$$CSP_{i,t} = a_0 + a_1 DIG_{i,t} + a_2 Cater_{i,t} + a_3 DIG_{i,t} \times Cater_{i,t} + a_4 Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (4)$$

In Equation (4), $Cater_{i,t}$ is the catering index for digital transformation information disclosure of firm i in year t , and $DIG_{i,t} \times Cater_{i,t}$ is the interaction term between the core

explanatory variable and the moderating variable, while other variables are defined consistently with the benchmark model.

3.1.4. Moderated Mediation Effect Model

To test Hypothesis 4, this paper refers to the method for testing moderated mediation effects (moderating the first-half pathway) proposed by Wen and Ye [58] and constructs the following models to examine the moderating role of Cater:

$$GCO_{i,t} = b_0 + b_1DIG_{i,t} + b_2Cater_{i,t} + b_3DIG_{i,t} \times Cater_{i,t} + b_4Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (5)$$

$$CSP_{i,t} = c_0 + c_1DIG_{i,t} + c_2Cater_{i,t} + c_3DIG_{i,t} \times Cater_{i,t} + c_4GCO_{i,t} + c_5Controls_{i,t} + \mu_j + v_t + \varepsilon_{i,t} \quad (6)$$

If the coefficient b_3 in Model (5) and the coefficient c_4 in Model (6) are significant, then the moderated mediation effect (moderating the first-half pathway) is established.

3.2. Variable Definition

3.2.1. Dependent Variable

The dependent variable is corporate sustainability performance, reflecting firms' achievement of sustainable development goals across economic, environmental, and social areas. Xie and Zhu [59] used ambidextrous performance as a proxy for corporate sustainability, with economic performance measured by return on assets (ROA) and environmental/social responsibility measured by CSR scores. As the concept of sustainable development has deepened in recent years, CSR has gradually evolved into ESG, expanding the scope for evaluating sustainability performance [60]. Wang and Kang [61] proposed measuring sustainability performance using ROA and the ESG environmental score. By assuming social responsibilities, enterprises can improve brand image and employee care; better governance helps identify and fix risks [62]. Social and governance aspects are key to sustainable development. In line with these perspectives, this paper uses return on assets (ROA) to measure corporate economic performance and the Huazheng ESG index to capture enterprises' overall environmental and social responsibility performance. However, because these indicators cover different dimensions and no standard weight allocation exists, simple summation or arbitrary assignment lacks objectivity. Therefore, this paper uses the entropy method to integrate firms' performance across economic development, environmental and social responsibility, and constructs a composite indicator of corporate sustainability performance (CSP), as shown in Table 1. The entropy method determines weights based on data dispersion, avoiding subjectivity and minimizing indicator overlap.

Table 1. Indicator System for Corporate Sustainability Performance.

Evaluation Object	Dimension	Indicator	Direction	Weight
Corporate Sustainability Performance	Economic performance	Return on assets	Positive	0.2209
	Environmental and social responsibility performance	Huazheng ESG Index	Positive	0.7791

3.2.2. Independent Variable

Drawing on the measurement approach for the carbon information disclosure catering index [63], we standardize both the degree of digital transformation information dis-

closure and the actual digital transformation behavior by subtracting each mean and dividing by its standard deviation. The catering index is then constructed as the difference between these two standardized values. Specifically, this study draws on the work of Wu et al. [64] and selects 76 word frequencies across five categories, namely artificial intelligence, big data, cloud computing, blockchain, and digital applications, as keywords for digital transformation information disclosure. Using textual analysis, the degree of digital transformation information disclosure (DIG) is measured by dividing the total frequency of relevant keywords in the Management Discussion & Analysis (MD&A) section of listed firms' annual reports by the MD&A length and multiplying by 100. Furthermore, drawing on the work of Liu et al. [54], this study uses the Corporate Digital Transformation Index from the CSMAR database to measure enterprises' actual digital transformation behavior (TDIG). The CSMAR team and a research team from East China Normal University jointly developed this index. It is calculated as a weighted sum of standardized scores across six dimensions: strategic leadership, technology-driven capability, organizational empowerment, environmental support, digital achievements, and digital applications. The specific calculation is shown in Formula (7):

$$\begin{aligned} \text{Digital Transformation Index} = & 0.3472 \times \text{Strategic Leadership Score} + 0.1620 \\ & \times \text{Technology - Driven Score} + 0.0969 \times \text{Organizational Empowerment Score} \\ & + 0.0342 \times \text{Environmental Support Score} + 0.2713 \times \text{Digital Achievement} \\ & \text{Score} + 0.0884 \times \text{Digital Application Score} \end{aligned} \quad (7)$$

This index is not a single measure of digital investment, digital patents, or IT assets; rather, it comprehensively reflects firms' level of digital transformation across multiple dimensions, including strategy, technology, organization, environment, application, and outcomes. A higher value of this index indicates a higher actual level of digital transformation. As the standards for digital transformation information disclosure vary across industries, this study compares each firm's digital transformation information disclosure and its actual digital transformation behavior with those of peer enterprises in the same industry, and then computes the standardized difference. The specific calculation is presented in Equation (8). A higher value of Cater indicates that a firm's digital transformation disclosure level is higher relative to its actual digital transformation level, reflecting a stronger tendency toward relative over-disclosure or catering. A lower Cater value indicates that the firm's disclosure is relatively conservative, or that its actual digital transformation level exceeds its disclosure level. The term "catering behavior" in this paper does not directly identify firms' subjective intention to deceive; rather, it refers to the relative deviation between digital transformation disclosure and the actual level of digital transformation.

$$\text{Cater}_{i,t} = \left[\frac{(DIG_{i,t} - \overline{DIG}_{i,t})}{\sigma_{DIG}} \right] - \left[\frac{(TDIG_{i,t} - \overline{TDIG}_{i,t})}{\sigma_{TDIG}} \right] \quad (8)$$

where $DIG_{i,t}$ represents the digital transformation disclosure performance of firm i in year t ; and $TDIG_{i,t}$ denotes the actual digital transformation performance of firm i in year t . $\overline{DIG}_{i,t}$, $\overline{TDIG}_{i,t}$, σ_{DIG} , and σ_{TDIG} are the mean and standard deviation of the digital transformation disclosure performance and the actual digital transformation performance, respectively. $\text{Cater}_{i,t}$ represents the digital transformation information disclosure catering index for the firm.

3.2.3. Mediating Variable

Green patents are a core technological carrier for firms to address environmental governance and emission control, and they can effectively reflect the substantive output of green innovation activities. Compared with traditional indicators such as R&D investment, jointly applied patents better capture the degree of interaction and integration among collaborating entities in the process of technological R&D. Accordingly, drawing

on the research of Yang and Wang [41], this study uses the number of jointly applied green patents as a proxy for firms' green collaborative innovation. Given that the core of green collaborative innovation lies in technological breakthroughs and process improvements, this study focuses only on invention and utility model patents. Specifically, it calculates the total number of green inventions and green utility model patents jointly applied for by the firm in a given year, and then takes the natural logarithm of 1 plus this total as the measure of green collaborative innovation (GCO).

3.2.4. Control Variables

Drawing on existing research, the following variables are included as controls to enhance the reliability of the results: Leverage ratio (Lev), Enterprise growth (Growth), Firm size (Size), Return on sales (Ros), Government subsidies (Gov), Enterprise ownership type (Soe), Ownership balance (Balance), Compensation incentive (Coin), Management shareholding (Maho), Proportion of independent directors (Poid), Year (Year), and Industry (Ind), as shown in Table 2.

Table 2. Definition of control variables.

Variables	Symbol	Definition
Leverage ratio	Lev	Total liabilities to total assets at the end of the period
Enterprise growth	Growth	The annual growth rate of operating revenue
Enterprise size	Size	The logarithm of total assets
Return on sales	Ros	The ratio of operating profit to operating revenue
Government subsidies	Gov	The logarithm of one plus the annual amount of government subsidies received by the firm
Enterprise ownership type	Soe	Equal to 1 if the enterprise is state-owned and 0 otherwise
Ownership balance	Balance	The ratio of the sum of the shareholding percentages of the 2nd to 5th largest shareholders to the shareholding percentage of the largest shareholder
Compensation incentive	Coin	The ratio of the sum of the top three executives' compensations to the Total compensation of the top management
Management shareholding	Maho	The ratio of the number of shares held by management to the total number of shares outstanding
Proportion of independent directors	Poid	The ratio of the number of external board members to the total number of directors
Year	Year	Dummy variable
Industry	Ind	Dummy variable

3.3. Sample Selection and Data Source

This study utilizes a sample of companies listed on China's A-share market from 2015 to 2024. Following prior studies, observations are excluded if they pertain to financial firms, specially treated firms (ST and *ST), insolvent firms, firms with substantial missing data for key variables, or firms with only one annual observation during the sample period. To mitigate the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles. The final sample consists of 19,830 firm-year observations. The data originates from three main channels: (1) Corporate digital transformation information disclosure metrics were obtained via web crawlers. (2) Data on green collaborative innovation were sourced from the China National Intellectual Property Administration.

(3) Other firm-level characteristics were sourced from the Wind database and CSMAR database.

4. Result Analysis

4.1. Descriptive Statistics

Table 3 presents the descriptive statistics for the main variables. Within the research sample, DIG has a mean of 0.0532 and a median of 0.01, indicating that the vast majority of firms have a relatively low level of DIG and that there is substantial variation in disclosure across firms. CSP exhibits a mean of 0.5545 and a median of 0.56, with a relatively symmetrical distribution, suggesting that most firms achieve a moderately high level of sustainable development performance; however, its standard deviation of 0.074 indicates non-negligible variation in performance levels across different enterprises. The statistical results for the other variables are generally consistent with those reported in the existing literature and, therefore, are not discussed in detail here.

Table 3. Descriptive statistics results.

Variables	Mean	SD	Min	Median	Max
CSP	0.5545	0.074	0.09	0.56	0.87
DIG	0.0532	0.104	0.00	0.01	0.58
Lev	0.4363	0.193	0.07	0.43	0.87
Growth	0.1254	0.344	−0.53	0.07	2.01
Size	22.6810	1.322	20.22	22.50	26.63
Ros	0.0721	0.173	−0.75	0.07	0.56
Gov	15.7002	4.356	0.00	16.65	20.65
Soe	0.4194	0.493	0.00	0.00	1.00
Balance	0.6895	0.566	0.03	0.52	2.59
Coin	0.4861	0.139	0.24	0.47	0.90
Maho	0.0938	0.154	0.00	0.00	0.60
Poid	0.3778	0.055	0.33	0.36	0.57

4.2. Benchmark Regression

Table 4 reports the benchmark regression results. Industry and year fixed effects are controlled for in all columns. Columns (1) and (2), based on Model (1), report the average effect of DIG on CSP. The coefficient of DIG is significantly positive, regardless of the inclusion of control variables, indicating that DIG has a significant positive impact on CSP. This result supports research Hypothesis 1.

Table 4. Benchmark regression results.

Variables	(1) CSP	(2) CSP
DIG	0.035 *** (0.007)	0.026 *** (0.006)
Lev		−0.079 *** (0.003)
Growth		−0.006 *** (0.001)
Size		0.022 *** (0.000)
Ros		0.074 *** (0.003)

Gov		0.000 *** (0.000)
Soe		0.013 *** (0.001)
Balance		−0.002 ** (0.001)
Coin		−0.042 *** (0.003)
Maho		0.047 *** (0.003)
Poid		0.087 *** (0.009)
_cons	0.507 *** (0.005)	0.018 (0.011)
Industry & Year	YES	YES
N	19,830	19,830
adj. R ²	0.030	0.234

Notes: *** and ** represent significance at the 1% and 5% levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

4.3. Endogeneity Test

To address potential endogeneity issues, this paper constructs instrumental variables using the average digital transformation of other listed firms located in the same city as the sample firm in the previous year (IV_DIG) and the number of post offices per million people in 1984 (IV_1984). Since the number of post offices in 1984 is cross-sectional data, this paper uses its interaction with the one-period-lagged number of internet users nationwide as the instrumental variable [65]. Before the widespread adoption of digital technology, post offices served as the primary channel for information transmission and for installing fixed-line telephones, while early internet access relied on dial-up networks over fixed telephone lines. Therefore, regions with a higher density of post offices had a first-mover advantage in digital infrastructure, which, in turn, affected enterprises' current levels of digital transformation and information disclosure behavior. Moreover, the number of post offices in 1984 is historical geographical information that does not directly determine firms' current sustainability performance, nor does it indirectly affect it through other channels such as regional long-term economic development, human capital accumulation, or industrial structure. Thus, this instrumental variable satisfies both relevance and exogeneity conditions.

Table 5 presents the regression results obtained using this approach. The first-stage results show that the coefficients for both IV_DIG and IV_1984 are significantly positive, satisfying the relevance condition. The Kleibergen–Paap rk Wald F statistic exceeds the 10% critical value of the Stock–Yogo weak identification test, and the Kleibergen–Paap rk LM statistic is significant at the 1% level, indicating that weak-instrument and under-identification concerns are not present. The Hansen overidentification test supports the null hypothesis of instrument exogeneity, indicating no overidentification and that the selected instruments are valid. The second-stage results indicate that the coefficients for DIG remain significantly positive, demonstrating that the conclusions remain robust after mitigating endogeneity concerns.

Table 5. Endogeneity test results.

Variables	First Stage DIG	Second Stage CSP
DIG		0.240 *** (0.057)
IV_1984	0.000 ** (0.000)	
IV_DIG	0.229 *** (0.025)	
Lev	−0.027 *** (0.006)	−0.078 *** (0.005)
Growth	0.006 ** (0.003)	−0.008 *** (0.002)
Size	0.001 ** (0.001)	0.024 *** (0.001)
Ros	−0.020 *** (0.007)	0.077 *** (0.005)
Gov	0.001 *** (0.000)	0.000 (0.000)
Soe	−0.008 *** (0.002)	0.017 *** (0.002)
Balance	0.003 * (0.002)	−0.004 *** (0.001)
Coin	−0.030 *** (0.007)	−0.030 *** (0.005)
Maho	0.004 (0.007)	0.047 *** (0.005)
Poid	0.027 * (0.015)	0.056 *** (0.011)
_cons	−0.027 (0.017)	−0.018 (0.015)
Industry & Year	YES	YES
N	12,150	12,150
F	86.211	— —
Kleibergen–Paap rk LM statistic		102.039 *** [0.0000]
Kleibergen–Paap rk Wald F statistic		49.897 {19.93}
Hansen J statistic		0.006 [0.9386]

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses. Values in [] denote *p*-values, while values in { } represent the critical values for the Stock–Yogo weak recognition test at the 10% significance level.

4.4. Robustness Tests

To enhance the robustness of the empirical findings, this study employs five methods to conduct robustness checks, as shown in Table 6. First, the core explanatory variable is adjusted. Following the methodology of Zhao et al. [66], this study counts relevant word frequencies across four dimensions, digital technology application, internet business model, intelligent manufacturing, and modern information system, to re-measure the de-

gree of digital transformation information disclosure. The regression results are reported in Column (1) of Table 6. The coefficient of DIG is significant at the 1% level, consistent with the preceding empirical results. Second, the dependent variable is replaced. To examine whether the measurement of the dependent variable affects the model results, this study reconstructs the CSP indicator using the equal-weighting method as a robustness check. As shown in Column (2) of Table 6, the regression coefficient of DIG remains significantly positive. Third, the regression model is replaced. To examine whether the empirical conclusion depends on a specific model specification, this study employs a Tobit model as a supplementary robustness check. As shown in Column (3) of Table 6, the coefficient of DIG remains significantly positive at the 1% level. Fourth, lagged variables are used. Considering the possible time-lagged effect of digital transformation information disclosure on corporate sustainability performance, this study lags all explanatory variables and control variables by one period and re-estimates the regression model. As reported in Column (4) of Table 6, the regression results remain consistent with the previous findings. Fifth, the sample range is adjusted. Considering that the 2015 Chinese stock market crash and the COVID-19 pandemic from 2020 to 2022 exerted substantial shocks on China's market, which may have further affected firms' digital transformation processes, this study excludes firm-year observations from 2015 and 2020–2022 and re-examines the robustness of the empirical results. Column (5) of Table 6 reports the regression results based on this approach. The coefficient of DIG is significant at the 1% level, further confirming the robustness of the empirical findings.

Table 6. Robustness Analysis.

Variables	(1) CSP	(2) CSP	(3) CSP	(4) CSP	(5) CSP
DIG	0.021 *** (0.003)	0.012 ** (0.006)	0.026 *** (0.006)	0.025 *** (0.007)	0.018 ** (0.008)
Lev	−0.080 *** (0.003)	−0.093 *** (0.003)	−0.079 *** (0.003)	−0.073 *** (0.004)	−0.086 *** (0.005)
Growth	−0.006 *** (0.001)	0.012 *** (0.001)	−0.006 *** (0.001)	0.003 ** (0.002)	−0.008 *** (0.002)
Size	0.022 *** (0.000)	0.021 *** (0.000)	0.022 *** (0.000)	0.022 *** (0.001)	0.025 *** (0.001)
Ros	0.074 *** (0.003)	0.300 *** (0.004)	0.074 *** (0.003)	0.083 *** (0.004)	0.081 *** (0.005)
Gov	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.001 *** (0.000)
Soe	0.013 *** (0.001)	0.007 *** (0.001)	0.013 *** (0.001)	0.016 *** (0.001)	0.016 *** (0.002)
Balance	−0.002 ** (0.001)	−0.004 *** (0.001)	−0.002 ** (0.001)	−0.002 * (0.001)	−0.003 ** (0.001)
Coin	−0.041 *** (0.003)	−0.034 *** (0.003)	−0.042 *** (0.003)	−0.036 *** (0.004)	−0.046 *** (0.005)
Maho	0.047 *** (0.003)	0.045 *** (0.003)	0.047 *** (0.003)	0.040 *** (0.004)	0.052 *** (0.005)
Poid	0.086 *** (0.009)	0.055 *** (0.008)	0.087 *** (0.009)	0.085 *** (0.009)	0.092 *** (0.012)
_cons	0.018 (0.011)	0.096 *** (0.010)	0.018 (0.011)	0.021 * (0.012)	−0.069 *** (0.016)
Industry & Year	YES	YES	YES	YES	YES
N	19,830	19,830	19,830	17,720	11,898
adj. R ²	0.235	0.556	—	0.226	0.243

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

5. Extended Analysis

5.1. Identification of Catering Behavior

To examine whether the Cater index effectively captures the gap between digital transformation information disclosure and the actual level of digital transformation, this study analyzes the distributional characteristics of TDIG and the Cater index. As shown in Table 7, TDIG ranges from 22.61 to 88.03, indicating substantial variation in the actual level of digital transformation among the sample firms. The mean value of Cater is close to zero and consistent with the nature of a standardized difference variable. Its maximum value is 9.05, suggesting that some firms disclose a level of digital transformation that is substantially higher than their actual level, reflecting a relatively strong tendency toward over-disclosure or catering.

Table 7. Descriptive Statistics of main variables.

Variables	Mean	SD	Min	Median	Max
DIG	0.0532	0.104	0.00	0.01	0.58
TDIG	39.5193	10.945	22.61	38.13	88.03
Cater	0.0000	0.942	−3.91	−0.03	9.05

To further validate the Cater index, this study examines the effects of Cater in year t on firm value (Tobin's Q), the actual level of digital transformation (TDIG), financial restatements (Res), and information disclosure violations (Vio) in year $t + 1$. If Cater mainly reflects firms' general communication style or optimistic expression, it should not systematically predict future adverse outcomes. By contrast, if Cater captures the deviation between digital transformation disclosure and actual digital transformation, a higher Cater value should be unlikely to improve future firm value or the actual level of digital transformation. It may instead be associated with higher information-quality risk. The definitions of the relevant variables are shown in Table 8.

Table 8. Definition of relevant variables.

Variables	Symbol	Definition
Firm value	Tobin's Q	Market value/Total assets
Actual level of digital transformation	TDIG	Corporate digital transformation index from the CSMAR database
Financial restatement	Res	Following the work of Ma et al. [67], this study identifies the fiscal year corresponding to the corrected annual report disclosed in the financial restatement announcement as the year of financial restatement. The variable equals 1 if a financial restatement occurs in the firm's annual report, and 0 otherwise.
Information disclosure violation	Vio	Following the work of Zhu et al. [68], this study obtains data on information disclosure violations of listed firms from the CSMAR Violation and Penalty Database. The variable equals 1 if a listed firm commits an information disclosure violation in a given year, including false statements or misleading statements, inaccurate disclosure, delayed disclosure, material omissions, or inflated assets, and is publicly investigated or penalized by the China Securities Regulatory Commission and its branches, stock exchanges, or other securities

regulatory authorities in that year; otherwise, it equals 0.

As shown in Table 9, Cater does not significantly improve future firm value or the actual level of digital transformation. Instead, it is positively associated with financial restatements and information disclosure violations. These results provide preliminary support for the validity of the identification and measurement of digital transformation disclosure catering behavior in this study.

Table 9. Regression Results for Identifying Catering Behavior.

Variables	(1) Tobin'Q	(2) TDIG	(3) Res	(4) Vio
Cater	−0.029 *** (0.009)	−4.098 *** (0.134)	0.006 ** (0.002)	0.010 *** (0.003)
Lev	−0.625 *** (0.068)	−1.967 *** (0.397)	0.072 *** (0.016)	0.135 *** (0.020)
Growth	0.145 *** (0.027)	0.618 *** (0.180)	0.020 *** (0.007)	0.012 (0.009)
Size	−0.308 *** (0.010)	0.655 *** (0.056)	−0.010 *** (0.002)	−0.015 *** (0.003)
Ros	0.608 *** (0.076)	−1.221 *** (0.416)	−0.120 *** (0.017)	−0.162 *** (0.020)
Gov	−0.011 *** (0.002)	0.097 *** (0.012)	−0.001 ** (0.000)	−0.001 (0.001)
Soe	−0.072 *** (0.021)	−1.386 *** (0.140)	−0.023 *** (0.006)	−0.079 *** (0.007)
Balance	0.019 (0.015)	0.224 ** (0.105)	0.007 (0.004)	0.010 ** (0.005)
Coin	0.188 *** (0.066)	−1.899 *** (0.429)	0.015 (0.017)	0.023 (0.021)
Maho	−0.645 *** (0.071)	2.930 *** (0.465)	−0.035 * (0.019)	−0.057 ** (0.022)
Poid	1.299 *** (0.162)	8.187 *** (1.042)	−0.029 (0.041)	−0.037 (0.048)
_cons	9.789 *** (0.228)	11.736 *** (1.292)	0.415 *** (0.052)	0.604 *** (0.063)
Industry & Year	YES	YES	YES	YES
N	15,940	18,080	18,080	18,080
adj. R ²	0.331	0.557	0.046	0.036

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

5.2. Mechanism Testing

5.2.1. Mediating Mechanisms

To uncover the transmission mechanism by which DIG promotes CSP, this paper selects GCO as a mediator and employs stepwise regression to test it. The results are presented in Table 10. Column (1) shows that DIG significantly promotes CSP. Column (2) reveals that the regression coefficient of DIG on GCO is significantly positive at the 1% level, indicating that DIG facilitates green technology cooperation and knowledge sharing between firms and other innovation actors, thereby enhancing the level of GCO. Column (3) incorporates both DIG and GCO into the CSP regression model. The results show that

the coefficients for both variables are significantly positive, suggesting that GCO partially mediates the relationship between DIG and CSP. Hypothesis 2 is thus validated.

To further verify the mediating effect, this paper conducts the Sobel test and the Bootstrap method. The results show that the p -value of the Sobel test is far below 0.01; in the Bootstrap test, the confidence interval for the indirect effect is (0.007, 0.022) and that for the direct effect is (0.0112, 0.2159), neither of which contains zero. Both testing methods support the existence of the mediating effect, confirming the robustness of the mediation model in this paper.

Table 10. Results of the mediating mechanism analysis.

Variables	(1) CSP	(2) GCO	(3) CSP
DIG	0.026 *** (0.006)	0.142 *** (0.051)	0.025 *** (0.006)
GCO			0.007 *** (0.001)
Lev	−0.079 *** (0.003)	−0.067 *** (0.025)	−0.079 *** (0.003)
Growth	−0.006 *** (0.001)	−0.031 *** (0.010)	−0.006 *** (0.001)
Size	0.022 *** (0.000)	0.144 *** (0.007)	0.021 *** (0.001)
Ros	0.074 *** (0.003)	−0.017 (0.020)	0.074 *** (0.003)
Gov	0.000 *** (0.000)	−0.009 *** (0.002)	0.000 *** (0.000)
Soe	0.013 *** (0.001)	0.022 ** (0.010)	0.013 *** (0.001)
Balance	−0.002 ** (0.001)	−0.006 (0.007)	−0.002 ** (0.001)
Coin	−0.042 *** (0.003)	−0.205 *** (0.030)	−0.040 *** (0.003)
Maho	0.047 *** (0.003)	−0.002 (0.023)	0.047 *** (0.003)
Poid	0.087 *** (0.009)	0.317 *** (0.078)	0.085 *** (0.009)
_cons	0.018 (0.011)	−2.954 *** (0.135)	0.039 *** (0.012)
Industry & Year	YES	YES	YES
N	19,830	19,830	19,830
adj. R ²	0.234	0.129	0.237
Sobel test			$Z = 2.69, p = 0.00714644$
Bootstrap test (indirect effect)			(0.0069635, 0.0216598) (significant)
Bootstrap test (direct effect)			(0.0112198, 0.2159189) (significant)

Notes: *** and ** represent significance at the 1% and 5% levels, respectively. Standard errors clustered at the firm level are reported in parentheses. The values in parentheses in the Bootstrap test row are the 95 percent confidence intervals for the product of coefficients.

5.2.2. Moderating Mechanisms

To test whether Cater in DIG exerts a direct moderating effect, the interaction term between the core explanatory variable and the moderating variable, $DIG \times Cater$, is added to Model (4) for regression analysis. As shown in Table 11, the coefficient of DIG is significantly positive, while the coefficient of the interaction term is significantly negative, indicating that Cater plays a negative moderating role between DIG and CSP. That is, Cater weakens the enhancing effect of DIG on CSP. Thus, Hypothesis 3 is verified. However, the specific pathways through which Cater exerts its moderating effect remain to be further explored.

Table 11. Results of the moderating mechanism analysis.

Variables	(1) CSP	(2) CSP
DIG	0.110 *** (0.009)	0.071 *** (0.008)
Cater	−0.011 *** (0.001)	−0.006 *** (0.001)
DIG × Cater	−0.013 *** (0.004)	−0.010 *** (0.003)
Lev		−0.080 *** (0.003)
Growth		−0.006 *** (0.001)
Size		0.022 *** (0.000)
Ros		0.074 *** (0.003)
Gov		0.000 *** (0.000)
Soe		0.013 *** (0.001)
Balance		−0.002 ** (0.001)
Coin		−0.040 *** (0.003)
Maho		0.046 *** (0.003)
Poid		0.084 *** (0.009)
_cons	0.507 *** (0.005)	0.037 *** (0.012)
Industry & Year	YES	YES
N	19,830	19,830
adj. R ²	0.050	0.240

Notes: *** and ** represent significance at the 1% and 5% levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

Based on the aforementioned results for the mediation and moderation effects, a moderated mediation effect test is conducted next. Following the method of Wen [58], this paper constructs Models (5) and (6). Table 12 reports the test results of the moderated mediation effect. In Model (5), the coefficient of the interaction term is −0.095; in Model (6), the coefficient of GCO is 0.006. Both are significant at the 1% level, indicating that the moderated mediation effect holds and that the moderation occurs on the first-half path-

way. This implies that the more severe the catering behavior, the weaker the promotional effect of digital transformation on green collaborative innovation, thereby hindering improvements in corporate sustainability performance. Thus, Hypothesis 4 is validated.

Table 12. Results of the moderated mediation effect regression.

Variables	(1) GCO	(2) CSP
DIG	0.596 *** (0.088)	0.068 *** (0.008)
Cater	−0.056 *** (0.006)	−0.005 *** (0.001)
DIG × Cater	−0.095 *** (0.032)	−0.009 *** (0.003)
GCO		0.006 *** (0.001)
Lev	−0.068 *** (0.025)	−0.079 *** (0.003)
Growth	−0.027 *** (0.010)	−0.005 *** (0.001)
Size	0.135 *** (0.007)	0.021 *** (0.001)
Ros	−0.016 (0.020)	0.074 *** (0.003)
Gov	−0.010 *** (0.002)	0.000 *** (0.000)
Soe	0.025 *** (0.010)	0.013 *** (0.001)
Balance	−0.006 (0.007)	−0.002 ** (0.001)
Coin	−0.182 *** (0.030)	−0.038 *** (0.003)
Maho	−0.016 (0.023)	0.046 *** (0.003)
Poid	0.285 *** (0.077)	0.082 *** (0.009)
_cons	−2.759 *** (0.131)	0.054 *** (0.012)
Industry & Year	YES	YES
N	19,830	19,830
adj. R ²	0.138	0.242

Notes: *** and ** represent significance at the 1% and 5% levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

5.3. Heterogeneity Analysis

Digital transformation information disclosure serves as an important signal through which firms convey their strategic intentions, technological capabilities, and development prospects to external stakeholders. Its performance effect, however, is not necessarily uniform across all firms and industry contexts. On the one hand, firm-specific characteristics may affect the credibility of digital disclosure signals and firms' ability to realize them. On the other hand, the external industry environment may influence how stakeholders identify, monitor, and evaluate such signals. Therefore, this study further examines the heter-

ogeneity in the effect of DIG on CSP from the perspectives of internal constraints and external environment.

5.3.1. Internal Constraints

Heterogeneity Analysis Based on Enterprise Ownership Type

An enterprise's ownership type is an important internal factor affecting the relationship between its digital transformation information disclosure behavior and sustainability performance. According to signaling theory, the effect of disclosure of digital transformation information depends on whether external stakeholders perceive it as a credible strategic signal. In the Chinese institutional context, ownership type may influence the credibility of such signals. State-owned enterprises (SOEs) usually undertake more policy-oriented and social objectives, possess relatively stable resource bases, and face stronger institutional constraints. Their digital transformation disclosures are therefore more likely to align with long-term strategic arrangements and substantive investment [69], making the positive effect of digital transformation disclosure on corporate sustainability performance more evident. By contrast, non-state-owned enterprises usually face stronger market competition, financing constraints, and external legitimacy pressure. Their managers may have stronger incentives to emphasize digital transformation narratives to send positive signals to the market and secure financing support, policy attention, or market recognition [70]. However, because non-state-owned enterprises are relatively disadvantaged in terms of access to resources, policy support, and institutional endorsement, when their digital transformation disclosure is substantially higher than their actual level of digital transformation, external stakeholders are more likely to perceive such disclosure as symbolic or strategic catering. This, in turn, weakens the positive effect of information disclosure on digital transformation on corporate sustainability performance.

This study employs subsample regression analysis to examine heterogeneity by enterprise ownership type. Table 13 reports the subsample regression results. The results show that the coefficient of DIG in the non-state-owned enterprise group is significantly lower than that in the state-owned enterprise group, indicating that the positive effect of DIG on CSP is more pronounced in state-owned enterprises, consistent with this study's expectations. Meanwhile, the negative moderating effect of DIG $\times$ Cater is more evident in the non-state-owned enterprise subsample. This suggests that, among firms facing stronger market pressure and weaker institutional endorsement, the deviation between DIG and TDIG is more likely to impair disclosure credibility, thereby weakening the positive effect of DIG on CSP.

Table 13. Results of heterogeneity analysis of ownership type.

Variables	(1) SOEs	(2) Non-SOEs	(3) SOEs	(4) Non-SOEs
DIG	0.066 *** (0.012)	0.011 (0.007)	0.107 *** (0.013)	0.054 *** (0.010)
Cater			−0.006 *** (0.001)	−0.005 *** (0.001)
DIG $\times$ Cater			−0.009 (0.007)	−0.009 ** (0.004)
Lev	−0.082 *** (0.005)	−0.078 *** (0.004)	−0.083 *** (0.005)	−0.078 *** (0.004)
Growth	−0.003 (0.002)	−0.007 *** (0.002)	−0.003 (0.002)	−0.007 *** (0.002)
Size	0.022 *** (0.001)	0.023 *** (0.001)	0.021 *** (0.001)	0.022 *** (0.001)

Ros	0.067 *** (0.005)	0.074 *** (0.004)	0.066 *** (0.005)	0.075 *** (0.004)
Gov	−0.000 (0.000)	0.001 *** (0.000)	−0.000 (0.000)	0.001 *** (0.000)
Balance	−0.001 (0.001)	−0.001 (0.001)	−0.002 (0.001)	−0.001 (0.001)
Coin	−0.034 *** (0.005)	−0.045 *** (0.005)	−0.032 *** (0.005)	−0.043 *** (0.005)
Maho	0.036 * (0.021)	0.046 *** (0.004)	0.027 (0.021)	0.045 *** (0.004)
Poid	0.098 *** (0.012)	0.078 *** (0.012)	0.093 *** (0.012)	0.075 *** (0.012)
_cons	0.010 (0.015)	0.026 (0.018)	0.030 * (0.015)	0.046 *** (0.018)
Industry & Year	YES	YES	YES	YES
N	8316	11,514	8316	11,514
adj. R ²	0.267	0.217	0.273	0.222

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

Heterogeneity Analysis Based on Enterprise Size

Enterprise size directly affects a firm's resource endowment, organizational capability, and ability to execute digital transformation, thereby influencing whether the signal conveyed by digital transformation information disclosure translates into actual operational improvements [71]. Larger firms usually possess sufficient financial, technological, human, and managerial resources, enabling them to continuously invest in digital infrastructure, business process reengineering, and organizational management transformation. Therefore, digital transformation information disclosure by large firms is likely to be supported by substantive investment and organizational capabilities, and to improve operational efficiency, optimize resource allocation, and enhance corporate sustainability performance through digital applications. Conversely, small and medium-sized firms generally have weaker resource bases and more limited capacity for investment in digital transformation and organizational execution. Even if they disclose more digital transformation-related content in their annual reports, they may find it difficult to develop sustained technological applications and management improvements. When DIG is substantially higher than TDIG, such a deviation is more likely to expose a gap between “saying more and doing less”, thereby weakening the positive effect of DIG on CSP.

This study divides the sample into small- and large-scale enterprises based on the median annual firm size and uses subsample regressions to examine size-based heterogeneity. The estimates in Table 14 show a clear difference between the two groups. The coefficient of DIG is lower among small firms than among large firms, whereas the negative moderating effect of DIG × Cater is more pronounced in the small-firm subsample. These findings suggest that, for firms with relatively limited resource bases and execution capabilities, catering behavior is more likely to weaken the performance-enhancing effect of digital disclosure.

Table 14. Results of heterogeneity analysis of enterprise size.

Variables	(1) Large	(2) Small	(3) Large	(4) Small
DIG	0.065 *** (0.010)	0.008 (0.008)	0.125 *** (0.012)	0.054 *** (0.011)

Cater			−0.011 *** (0.001)	−0.004 *** (0.001)
DIG × Cater			−0.004 (0.005)	−0.011 ** (0.005)
Lev	−0.034 *** (0.005)	−0.062 *** (0.004)	−0.037 *** (0.005)	−0.063 *** (0.004)
Growth	−0.008 *** (0.002)	−0.002 (0.002)	−0.007 *** (0.002)	−0.002 (0.002)
Ros	0.100 *** (0.006)	0.082 *** (0.004)	0.098 *** (0.006)	0.082 *** (0.004)
Gov	0.000 (0.000)	0.001 *** (0.000)	0.000 (0.000)	0.001 *** (0.000)
Soe	0.016 *** (0.002)	0.016 *** (0.002)	0.017 *** (0.002)	0.016 *** (0.002)
Balance	0.000 (0.001)	−0.003 *** (0.001)	0.001 (0.001)	−0.003 *** (0.001)
Coin	−0.054 *** (0.005)	−0.062 *** (0.005)	−0.045 *** (0.005)	−0.061 *** (0.005)
Maho	0.027 *** (0.007)	0.043 *** (0.004)	0.024 *** (0.007)	0.042 *** (0.004)
Poid	0.151 *** (0.013)	0.052 *** (0.012)	0.142 *** (0.013)	0.051 *** (0.012)
_cons	0.490 *** (0.011)	0.499 *** (0.008)	0.492 *** (0.011)	0.501 *** (0.008)
Industry & Year	YES	YES	YES	YES
N	9913	9917	9913	9917
adj. R ²	0.128	0.197	0.146	0.201

Notes: *** and ** represent significance at the 1% and 5% levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

5.3.2. External Environment

Heterogeneity Analysis Based on Industry Environmental Sensitivity

Industry environmental sensitivity reflects the extent to which the industry in which a firm operates is subject to environmental protection policies, public opinion, and stakeholder scrutiny. It is an important external context that affects the effectiveness of DIG [72]. From the perspective of legitimacy pressure and external monitoring, highly environmentally sensitive industries typically face stricter environmental regulation and greater public scrutiny. When disclosing information on digital transformation, firms in these industries need to respond more substantively to requirements related to environmental governance, energy conservation, emissions reduction and regulatory compliance. Therefore, DIG in such industries is more likely to be constrained by external monitoring, leaving relatively limited room for symbolic disclosure. Firms in industries with low environmental sensitivity face relatively weaker environmental regulatory pressure and public attention, and their digital disclosure is subject to fewer external constraints. In this context, DIG may more readily serve as a general strategic signal, helping firms project an image of technological upgrading and management improvement. However, due to weaker external monitoring, disclosure content is more likely to deviate from actual digital transformation actions, thereby weakening the positive effect of DIG on CSP.

Following Li et al. [73], this study divides the sample enterprises into high- and low-environmental-sensitivity industries based on whether they belong to heavily polluting industries. The subgroup estimates in Table 15 show that both the positive coefficient of DIG

and the negative coefficient of $DIG \times Cater$ are more pronounced in the low-environmental-sensitivity subsample. This indicates that when environmental constraints and external monitoring are relatively weak, DIG is more likely to generate a performance-enhancing effect; however, once disclosure deviates from the actual level of digital transformation, catering behavior also more strongly weakens the performance effect of digital disclosure.

Table 15. Results of heterogeneity analysis of Industry Environmental Sensitivity.

Variables	(1) High	(2) Low	(3) High	(4) Low
DIG	−0.022 (0.031)	0.024 *** (0.006)	0.089 * (0.048)	0.068 *** (0.008)
Cater			−0.007 *** (0.001)	−0.004 *** (0.001)
$DIG \times Cater$			−0.006 (0.011)	−0.012 *** (0.004)
Lev	−0.101 *** (0.007)	−0.071 *** (0.004)	−0.099 *** (0.007)	−0.071 *** (0.004)
Growth	−0.010 *** (0.003)	−0.004 *** (0.002)	−0.010 *** (0.003)	−0.004 ** (0.002)
Size	0.024 *** (0.001)	0.022 *** (0.001)	0.022 *** (0.001)	0.022 *** (0.001)
Ros	0.076 *** (0.007)	0.074 *** (0.004)	0.077 *** (0.007)	0.074 *** (0.004)
Gov	0.000 * (0.000)	0.000 *** (0.000)	0.000 * (0.000)	0.000 *** (0.000)
Soe	0.015 *** (0.002)	0.013 *** (0.001)	0.016 *** (0.002)	0.013 *** (0.001)
Balance	0.006 *** (0.002)	−0.005 *** (0.001)	0.006 *** (0.002)	−0.005 *** (0.001)
Coin	−0.039 *** (0.007)	−0.043 *** (0.004)	−0.037 *** (0.007)	−0.041 *** (0.004)
Maho	0.036 *** (0.006)	0.050 *** (0.004)	0.036 *** (0.006)	0.049 *** (0.004)
Poid	0.083 *** (0.018)	0.087 *** (0.010)	0.078 *** (0.018)	0.084 *** (0.010)
_cons	−0.007 (0.022)	0.019 (0.013)	0.024 (0.023)	0.038 *** (0.013)
Industry & Year	YES	YES	YES	YES
N	5946	13,884	5946	13,884
adj. R ²	0.220	0.248	0.226	0.253

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses. According to the Guidelines for the Industry Classification of Listed Companies revised by the China Securities Regulatory Commission in 2012 and the Catalog for Classified Management of Environmental Verification of Listed Companies issued by the Ministry of Environmental Protection, the following industries are defined as heavily polluting industries: B06, B07, B08, B09, C15, C17, C18, C19, C22, C25, C26, C27, C28, C29, C31, C32, D44, and D45.

Heterogeneity Analysis Based on Industry Competition Intensity

Industry competition is an important external environmental factor that affects the effectiveness of DIG. Digital transformation usually requires continuous investment and organizational adjustment, and the extent to which the disclosure signal translates into corporate sustainability performance depends on whether firms face external operating conditions that enable them to advance their digital strategies steadily. In highly competitive industries, firms face greater market-substitution pressure and short-term performance constraints. Managers tend to place greater emphasis on maintaining market share, controlling costs, and achieving short-term operating results, making it difficult for DIG to translate into continuous long-term performance improvement. In industries with lower competition, firms face weaker short-term competitive pressure, and digital disclosure is more likely to be connected with sustained technological application and process optimization, thereby promoting CSP. However, when DIG is substantially higher than TDIG, the credibility of the disclosure signal is also more likely to be impaired, and the weakening effect of catering behavior on the performance effect of digital disclosure may become more pronounced.

This study uses the Herfindahl–Hirschman Index (HHI) to measure industry competition intensity, calculated as the sum of the squared ratios of a firm’s main business revenue to the industry’s total main business revenue [74]. A higher value of this index indicates greater industry concentration and lower industry competition. Based on the annual median HHI, this study divides the sample into high- and low-industry-competition groups and conducts subgroup regressions. The regression results in Table 16 show that the positive coefficient of DIG is more pronounced in the low-industry-competition group, and the negative moderating effect of DIG × Cater is also stronger. These findings suggest that in industries with weaker competitive pressure and relatively stable external operating environments, DIG is more likely to translate into CSP. However, when digital disclosure lacks sufficient support from actual transformation, catering behavior may offset the benefits of a relatively stable competitive environment.

Table 16. Results of heterogeneity analysis of Industry Competition Intensity.

Variables	(1) Low	(2) High	(3) Low	(4) High
DIG	0.031 *** (0.010)	0.016 ** (0.008)	0.073 *** (0.014)	0.061 *** (0.010)
Cater			−0.004 *** (0.001)	−0.006 *** (0.001)
DIG × Cater			−0.010 * (0.006)	−0.006 (0.004)
Lev	−0.083 *** (0.005)	−0.079 *** (0.005)	−0.083 *** (0.005)	−0.079 *** (0.005)
Growth	−0.003 * (0.002)	−0.009 *** (0.002)	−0.003 (0.002)	−0.008 *** (0.002)
Size	0.023 *** (0.001)	0.023 *** (0.001)	0.022 *** (0.001)	0.022 *** (0.001)
Ros	0.068 *** (0.005)	0.080 *** (0.005)	0.068 *** (0.005)	0.080 *** (0.005)
Gov	0.000 ** (0.000)	0.000 *** (0.000)	0.000 ** (0.000)	0.000 ** (0.000)
Soe	0.013 *** (0.002)	0.014 *** (0.002)	0.013 *** (0.002)	0.014 *** (0.002)
Balance	−0.004 ***	−0.001	−0.004 ***	−0.001

	(0.001)	(0.001)	(0.001)	(0.001)
Coin	−0.046 ***	−0.036 ***	−0.044 ***	−0.034 ***
	(0.005)	(0.005)	(0.005)	(0.005)
Maho	0.063 ***	0.038 ***	0.060 ***	0.038 ***
	(0.005)	(0.004)	(0.005)	(0.004)
Poid	0.131 ***	0.045 ***	0.128 ***	0.043 ***
	(0.012)	(0.013)	(0.012)	(0.013)
_cons	0.003	0.060 ***	0.019	0.085 ***
	(0.015)	(0.016)	(0.015)	(0.017)
Industry & Year	YES	YES	YES	YES
N	9841	9979	9841	9979
adj. R ²	0.263	0.224	0.266	0.230

Notes: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively. Standard errors clustered at the firm level are reported in parentheses.

6. Conclusions and Implications

6.1. Research Conclusions

Using a moderated mediation model and drawing on data from listed companies from 2015 to 2024 as the sample, this paper constructs a catering index for digital transformation information disclosure (DIG), examines the impact of digital transformation information disclosure and its catering behavior (Cater) on corporate sustainability performance (CSP), and analyzes the underlying mechanisms. The results show that:

- (1) DIG significantly promotes CSP. The benchmark regression results indicate that the more sufficient the digital transformation information disclosed by enterprises, the better their comprehensive performance across the economic, environmental, and social dimensions. This conclusion remains valid after addressing endogeneity concerns and conducting robustness tests.
- (2) GCO plays a partial mediating role between DIG and CSP. Mechanism testing reveals that DIG indirectly enhances CSP by promoting green technology cooperation and knowledge sharing between enterprises and other innovation actors.
- (3) Cater negatively moderates the positive relationship between DIG and CSP. Specifically, the higher the degree of Cater, the weaker the enhancing effect of DIG on CSP. Furthermore, Cater also weakens the mediating role of GCO between the two variables. That is, Cater suppresses the positive impact of DIG on GCO, thereby reducing the improvement in CSP brought about by GCO. This indicates that Cater not only directly impairs the effectiveness of information disclosure but also indirectly harms CSP by disrupting the mediating transmission pathway.
- (4) Heterogeneity analysis shows that the negative moderating effect of Cater varies significantly under different internal and external conditions. From the perspective of internal characteristics, the weakening effect of Cater on CSP is more prominent in non-state-owned enterprises and small-sized enterprises. From the perspective of the external environment, the negative effect of Cater is more significant in contexts with low industry environmental sensitivity and low industry competition intensity.

6.2. Policy Implications

In light of this study's findings, the governance of digital transformation information disclosure should not focus solely on the quantity of disclosure. Greater attention should be paid to the authenticity and comparability of disclosure content, as well as to its consistency with firms' actual progress in digital transformation. The following recommendations are proposed:

- (1) The requirements for digital transformation information disclosure should be improved and firms should be guided to enhance the substance of their disclosure. Within the existing annual report disclosure framework, regulators may further refine disclosure requirements on digital transformation and encourage firms to explain their digital strategies, investment scale, technological application scenarios, business process optimization, organizational adjustments, and implementation outcomes. For firms that merely pile up conceptual expressions such as artificial intelligence, big data, and cloud computing without supporting specific projects or application outcomes, regulators may require them to explain the actual progress of digital transformation through inquiry letters, annual report reviews, and supplementary disclosures.
- (2) Mechanisms should be established to identify and constrain catering behavior in digital transformation disclosure. Regulators may use information such as annual report texts, digital investment, digital projects, information system construction, digital outcomes, and violation records to identify firms characterized by “high disclosure but low transformation.” For firms with obvious overstatement, concept speculation, or misleading statements, inquiry, rectification, and penalty mechanisms should be strengthened to increase the cost of catering disclosure.
- (3) Targeted support for substantive digital transformation and green collaborative innovation should be strengthened. Governments may help firms with stronger resource constraints improve their actual digital transformation capabilities through digital diagnostics, technical services, financing support, and talent training. At the same time, firms should be guided to apply digital technologies to green R&D, energy conservation, emissions reduction, process optimization, and collaborative innovation, thereby shifting digital transformation from information disclosure to capability building.

6.3. Research Limitations and Future Directions

This study examines the effect of digital disclosure on corporate sustainability performance and its underlying mechanism from the perspective of catering behavior in digital transformation information disclosure. However, there remains room for further extension.

First, the digital transformation information disclosure indicator used in this study primarily reflects the overall level of digital transformation disclosure, without further distinguishing whether digital technologies are directly applied to green scenarios such as green production, energy conservation and emission reduction or to environmental governance. Future research may develop green digital disclosure indicators using established dictionaries or advanced text analysis methods, and further compare the differential effects of general and green digital disclosure.

Second, the Cater index constructed in this study captures the deviation of digital transformation information disclosure from the actual level of digital transformation, and its rationality has been examined using relevant outcome variables. Future research may incorporate external information, such as stock exchange inquiry letters, regulatory penalties, media questioning, and Q&A records from investor interaction platforms, to further identify the specific manifestations and governance mechanisms of digital disclosure-catered behavior.

Third, this study measures green collaborative innovation by the number of jointly applied green patents, which primarily reflects the occurrence and scale of green technological cooperation. Future research may further incorporate information on green patent citations, patent grants, technological classifications, and collaborative innovation networks to extend the measurement of green collaborative innovation from the perspectives of innovation quality, technological breadth, and cooperation structure.

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References

1. Khaled, R.; Ali, H.; Mohamed, E.K.A. The Sustainable Development Goals and corporate sustainability performance: Mapping, extent and determinants. *J. Clean. Prod.* **2021**, *311*, 127599. <https://doi.org/10.1016/j.jclepro.2021.127599>.
2. Taha, M.F.; Mao, H.; Zhang, Z.; Elmasry, G.; Awad, M.A.; Abdalla, A.; Mousa, S.; Elwakeel, A.E.; Elsherbiny, O. Emerging Technologies for Precision Crop Management Towards Agriculture 5.0: A Comprehensive Overview. *Agriculture* **2025**, *15*, 582. <https://doi.org/10.3390/agriculture15060582>.
3. Sun, L.; Ong, T.S.; Teh, B.H.; Di Vaio, A. Sustainable performance measurement through digital transformation within the sustainable development framework: The mediating effect of supply chain concentration. *Sustain. Dev.* **2024**, *32*, 5895–5912. <https://doi.org/10.1002/sd.3007>.
4. Xi, J.P. Hold High the Great Banner of Socialism with Chinese Characteristics and Strive in Unity to Build a Modern Socialist Country in All Respects—Report to the 20th National Congress of the Communist Party of China. *Party Build.* **2022**, *11*, 4–28.
5. Communist Party of China Central Committee; State Council of the People's Republic of China. Plan for the Overall Layout of Building a Digital China. State Council of the People's Republic of China. 2023. Available online: https://www.gov.cn/xinwen/2023-02/27/content_5743484.htm (accessed on 17 July 2026).
6. Cui, Y.X.; Zhao, C.Y.; Zhang, Q. Impact of digital transformation in agribusinesses on total factor productivity. *Int. Food Agribus. Manag. Rev.* **2024**, *27*, 843–857. <https://doi.org/10.22434/ifamr1064>.
7. Zhou, B.L.; Ma, L.L.; Yang, S.H. Catering behaviors in corporate digitization disclosures: Identification and analyst forecast accuracy loss. *Res. Int. Bus. Financ.* **2024**, *68*, 102201. <https://doi.org/10.1016/j.ribaf.2023.102201>.
8. U.S. Securities and Exchange Commission. SEC Charges Two Investment Advisers with Making False and Misleading Statements About Their Use of Artificial Intelligence. U.S. Securities and Exchange Commission. 2024. Available online: <https://www.sec.gov/newsroom/press-releases/2024-36> (accessed on 17 July 2026).
9. International Organization of Securities Commissions. Artificial Intelligence in Capital Markets: Use Cases, Risks, and Challenges. International Organization of Securities Commissions. 2025. Available online: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD788.pdf> (accessed on 17 July 2026).
10. Zhang, C.; Wang, Y.Y. Non-financial information farsightedness and capital market information efficiency. *Humanit. Soc. Sci. Commun.* **2024**, *11*, 1. <https://doi.org/10.1057/s41599-024-03657-3>.
11. Wang, X.; Shan, Y.G.; Song, J.B. Customer information disclosure and corporate financing constraints. *Int. Rev. Financ. Anal.* **2023**, *89*, 102822. <https://doi.org/10.1016/j.irfa.2023.102822>.
12. Byard, D.; Shaw, K.W. Corporate Disclosure Quality and Properties of Analysts' Information Environment. *J. Account. Audit. Financ.* **2003**, *18*, 355–378. <https://doi.org/10.1177/0148558x0301800304>.
13. Jin, J.; Li, H.Y.; Hoskisson, R. The Use of Strategic Noise In Reactive Impression Management: How Do Market Reactions Matter? *Acad. Manag. J.* **2022**, *65*, 1303–1326. <https://doi.org/10.5465/amj.2018.1054>.
14. Pope, S.; Peillex, J.; El Ouadghiri, I.; Gomes, M. Floodlight or Spotlight? Public Attention and the Selective Disclosure of Environmental Information. *J. Manag. Stud.* **2024**, *61*, 1230–1265. <https://doi.org/10.1111/joms.12920>.
15. Ren, L.J.; Liu, J.J.; Hao, Q.Y. How digital transformation affects the cost of equity capital: The role of information disclosure quality and stock liquidity. *Ind. Corp. Change* **2023**, *33*, 1098–1122. <https://doi.org/10.1093/icc/dtad053>.
16. Gao, B.; Qin, M.M.; Xie, J. Does corporate digital transformation improve capital market transparency? Evidence from China. *North Am. J. Econ. Financ.* **2025**, *76*, 102363. <https://doi.org/10.1016/j.najef.2025.102363>.

17. Coen, D.; Herman, K.; Pegram, T. Are corporate climate efforts genuine? An empirical analysis of the climate ‘talk-walk’ hypothesis. *Bus. Strategy Environ.* **2022**, *31*, 3040–3059. <https://doi.org/10.1002/bse.3063>.
18. Armstrong, C.S.; Heinle, M.S.; Luneva, I. Financial information and diverging beliefs. *Rev. Account. Stud.* **2024**, *29*, 2082–2124. <https://doi.org/10.1007/s11142-024-09832-w>.
19. Wei, J. Does the “Greenwashing” and “Brownwashing” of Corporate Environmental Information Affect the Analyst Forecast Accuracy? *Sustainability* **2023**, *15*, 11461. <https://doi.org/10.3390/su151411461>.
20. Rahmani, A.; Naeini, A.B.; Mashayekh, J.; Aboojafari, R.; Daim, T.; Yalcin, H. Green innovation for a greener future: A meta-analysis of the impact on environmental performance. *J. Clean. Prod.* **2024**, *460*, 142547. <https://doi.org/10.1016/j.jclepro.2024.142547>.
21. Liu, M.Z.; Lu, J.; Liu, Q.Y.; Wang, H.; Yang, Y.; Fang, S. The impact of executive cognitive characteristics on a firm’s ESG performance: An institutional theory perspective. *J. Manag. Gov.* **2025**, *29*, 145–173. <https://doi.org/10.1007/s10997-024-09695-y>.
22. Minciullo, M.; Zaccone, M.C.; Pedrini, M. The Antecedents of Corporate Sustainability Performance: A Study on Generic and Sustainability-Related Corporate Governance Mechanisms. *Sustainability* **2022**, *14*, 9761. <https://doi.org/10.3390/su14159761>.
23. Zhang, X.Y.; Xie, X.R.; Xiao, J.; Wang, Y. Green credit and enterprises’ carbon emission intensity: Empirical data from Chinese microenterprises. *Sci. Rep.* **2025**, *15*, 13338. <https://doi.org/10.1038/s41598-025-98139-0>.
24. Duanmu, J.L.; Bu, M.L.; Pittman, R. Does market competition dampen environmental performance? Evidence from China. *Strateg. Manag. J.* **2018**, *39*, 3006–3030. <https://doi.org/10.1002/smj.2948>.
25. Earnhart, D. Effect of Systems to Manage Environmental Aspects on Environmental Performance. *Sustainability* **2013**, *5*, 2557–2588. <https://doi.org/10.3390/su5062557>.
26. Tang, M.F.; Walsh, G.; Lerner, D.; Fitza, M.A.; Li, Q. Green Innovation, Managerial Concern and Firm Performance: An Empirical Study. *Bus. Strategy Environ.* **2018**, *27*, 39–51. <https://doi.org/10.1002/bse.1981>.
27. Opazo-Basáez, M.; Monroy-Osorio, J.C.; Maric, J. Evaluating the effect of green technological innovations on organizational and environmental performance: A treble innovation approach. *Technovation* **2024**, *129*, 102885. <https://doi.org/10.1016/j.technovation.2023.102885>.
28. Yang, Y.; Han, J.M. Digital transformation, financing constraints, and corporate environmental, social, and governance performance. *Corp. Soc. Responsib. Environ. Manag.* **2023**, *30*, 3189–3202. <https://doi.org/10.1002/csr.2546>.
29. Jiang, L.; Li, B.; Zhang, M. The impact of digital transformation on the efficiency of corporate resource allocation: Internal mechanisms and external environment. *Technol. Forecast. Soc. Change* **2025**, *215*, 124107. <https://doi.org/10.1016/j.techfore.2025.124107>.
30. Zhu, Y.D.; Li, C.Q. Research on the Impact of Digital and Green Transformation on Corporate Sustainability Performance from a Synergistic Perspective. *Systems* **2025**, *13*, 820. <https://doi.org/10.3390/systems13090820>.
31. Ma, R.Y.; Lin, B.Q. Internet development, information availability, and Chinese enterprises’ cooperative green technology innovation. *J. Environ. Manag.* **2024**, *367*, 121972. <https://doi.org/10.1016/j.jenvman.2024.121972>.
32. Amini, M.; Bienstock, C.C. Corporate sustainability: An integrative definition and framework to evaluate corporate practice and guide academic research. *J. Clean. Prod.* **2014**, *76*, 12–19. <https://doi.org/10.1016/j.jclepro.2014.02.016>.
33. López-Santamaría, M.; Amaya, N.; Hinestroza, M.P.G.; Cuero, Y.A. Sustainability disclosure practices as seen through the lens of the signaling theory: A study of companies listed on the Colombian Stock Exchange. *J. Clean. Prod.* **2021**, *317*, 128416. <https://doi.org/10.1016/j.jclepro.2021.128416>.
34. Fedorova, E.A.; Drogovoz, P.; Nevredinov, A. The Impact of Disclosing Digitalization Information on Corporate Financial Performance. *J. Corp. Financ. Res.* **2024**, *18*, 56–69. <https://doi.org/10.17323/j.jcfr.2073-0438.18.2.2024.56-69>.
35. Guo, J.W.; Duan, J.J. The impact of MD&A digital transformation information disclosure on stock price synchronicity in China. *North Am. J. Econ. Financ.* **2024**, *74*, 102253. <https://doi.org/10.1016/j.najef.2024.102253>.
36. Wang, W.; Sun, M.L. Digital transformation and the cost of equity capital: Evidence from China. *Int. Rev. Econ. Financ.* **2026**, *109*, 105262. <https://doi.org/10.1016/j.iref.2026.105262>.
37. Healy, P.M.; Palepu, K.G. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *J. Account. Econ.* **2001**, *31*, 405–440. [https://doi.org/10.1016/s0165-4101\(01\)00018-0](https://doi.org/10.1016/s0165-4101(01)00018-0).
38. Zeng, X.; Xin, Y.Y.; Xiang, K. The spillover effect of customer annual report tone on supplier ESG decisions. *Int. Rev. Financ. Anal.* **2025**, *107*, 104665. <https://doi.org/10.1016/j.irfa.2025.104665>.
39. Ji, H.Y.; Sheng, S.Y.; Wan, J. Symbolic or Substantive? The Effects of the Digital Transformation Process on Environmental Disclosure. *Systems* **2024**, *12*, 197. <https://doi.org/10.3390/systems12060197>.

40. Li, G.Z.; Shi, X.L.; Yang, Y.F.; Lee, P.K.C. Green Co-Creation Strategies among Supply Chain Partners: A Value Co-Creation Perspective. *Sustainability* **2020**, *12*, 4305. <https://doi.org/10.3390/su12104305>.
41. Yang, Z.H.; Wang, X.L. Enterprises Digital Transformation and Green Synergistic Innovation Behavior. *Econ. Perspect.* **2024**, *12*, 73–91.
42. Wong, C.Y.; Boon-itt, S.; Wong, C.W.Y. The contingency effects of internal and external collaboration on the performance effects of green practices. *Resour. Conserv. Recycl.* **2021**, *167*, 105383. <https://doi.org/10.1016/j.resconrec.2020.105383>.
43. Carballo-Penela, A.; Mateo-Mantecón, I.; Alvarez, S.; Diz, C.; Luis, J. The Role of Green Collaborative Strategies in Improving Environmental Sustainability in Supply Chains: Insights from a Case Study. *Bus. Strategy Environ.* **2018**, *27*, 728–741. <https://doi.org/10.1002/bse.2027>.
44. Liu, C.Y.; Liu, W.; You, Y.L.; Yang, Q.; Li, M. Research on leading agricultural enterprises guiding farmers' participation in pre-production quality and safety control: Evidence from the Yangtze River Delta Region of China. *Front. Sustain. Food Syst.* **2025**, *9*, 1615223. <https://doi.org/10.3389/fsufs.2025.1615223>.
45. Wang, H.L. A study on the impact of enterprise digital transformation on informed trading. *PLoS ONE* **2024**, *19*, 12. <https://doi.org/10.1371/journal.Pone.0313623>.
46. Zhang, X.Y.; Li, W.L.; Gao, S. Market reactions to voluntary disclosures of a strategic alliance agreement: Evidence from China. *Span. J. Financ. Account.-Rev. Esp. Financ. Contab.* **2023**, *52*, 233–263. <https://doi.org/10.1080/02102412.2022.2051322>.
47. Di, K.X.; Xu, R.H.; Liu, Z.K.; Liu, R. How do enterprises' green collaborative innovation network locations affect their green total factor productivity? Empirical analysis based on social network analysis. *J. Clean. Prod.* **2024**, *438*, 140766. <https://doi.org/10.1016/j.jclepro.2024.140766>.
48. Lu, G.Y.; Li, B.X. Artificial Intelligence and Green Collaborative Innovation: An Empirical Investigation Based on a High-Dimensional Fixed Effects Model. *Sustainability* **2025**, *17*, 4141. <https://doi.org/10.3390/su17094141>.
49. Shentu, L.; Liu, W.Z.; Liu, Y.Y. Be alert of the hyped words around fancy tech! Strategic digitalization disclosure under earnings pressure. *Financ. Res. Lett.* **2024**, *67*, 105876. <https://doi.org/10.1016/j.frl.2024.105876>.
50. Huang, Z.; Du, F.Y.; Jin, H.F.; Jing, W. Can Investors Recognize the Digital Transformation Disclosure of “Talk More, Do Less”? Evidence from Stock Mispricing. *Foreign Econ. Manag.* **2025**, *47*, 19–35. <https://doi.org/10.16538/j.cnki.fem.20241115.101>.
51. Bolton, P.; Scheinkman, J.; Xiong, W. Executive compensation and short-termist behaviour in speculative markets. *Rev. Econ. Stud.* **2006**, *73*, 577–610. <https://doi.org/10.1111/j.1467-937X.2006.00388.x>.
52. Baier, C.; Götttsche, M.; Hellmann, A.; Schiemann, F. Too Good To Be True: Influencing Credibility Perceptions with Signaling Reference Explicitness and Assurance Depth. *J. Bus. Ethics* **2022**, *178*, 695–714. <https://doi.org/10.1007/s10551-020-04719-7>.
53. Chen, Z.H.; Hajiheydari, N.; Zhang, M.C.; Lin, Y.-E. Corporate digital transformation attention and innovation: Strategic commitment or symbolic signalling? *J. Strateg. Inf. Syst.* **2026**, *35*, 101971. <https://doi.org/10.1016/j.jsis.2026.101971>.
54. Liu, M.T.; Fang, X.B. The impact of digital transformation disclosure catering behavior on corporate green innovation. *Sci. Res. Manag.* **2026**, *47*, 84–94. <https://doi.org/10.19571/j.cnki.1000-2995.2026.05.009>.
55. Feng, T.W.; Jiang, Y.S.; Xu, D.H. The dual-process between green supplier collaboration and firm performance: A behavioral perspective. *J. Clean. Prod.* **2020**, *260*, 121073. <https://doi.org/10.1016/j.jclepro.2020.121073>.
56. Kostis, A.; Bengtsson, M.; Näsholm, M.H. Mechanisms and Dynamics in the Interplay of Trust and Distrust: Insights from project-based collaboration. *Organ. Stud.* **2022**, *43*, 1173–1196. <https://doi.org/10.1177/01708406211040215>.
57. Baron, R.M.; Kenny, D.A. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J. Personal. Soc. Psychol.* **1986**, *51*, 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>.
58. Wen, Z.L.; Ye, B.J. Different Methods for Testing Moderated Mediation Models: Competitors or Backups? *Acta Psychol. Sin.* **2014**, *46*, 714–726.
59. Xie, X.M.; Zhu, Q.W. How Can Green Innovation Solve the Dilemmas of “Harmonious Coexistence”? *Manag. World* **2021**, *37*, 128–149+129. <https://doi.org/10.19744/j.cnki.11-1235/f.2021.0009>.
60. Costa, A.J.; Curi, D.; Bandeira, A.M.; Ferreira, A.; Tomé, B.; Joaquim, C.; Santos, C.; Góis, C.; Meira, D.; Azevedo, G.; et al. Literature Review and Theoretical Framework of the Evolution and Interconnectedness of Corporate Sustainability Constructs. *Sustainability* **2022**, *14*, 4413. <https://doi.org/10.3390/su14084413>.
61. Wang, B.; Kang, Q. Digital Transformation and Enterprise Sustainable Development Performance. *Bus. Manag. J.* **2023**, *45*, 161–176. <https://doi.org/10.19616/j.cnki.bmj.2023.06.009>.
62. Wang, T.Y.; Yang, B. Corporate social responsibility, stakeholders' governance and idiosyncratic risk. *Financ. Res. Lett.* **2023**, *57*, 104215. <https://doi.org/10.1016/j.Frl.2023.104215>.

63. Sun, X.H.; Chen, T.Q.; Ma, X.J. Catering Behavior of Firms' Carbon Information Disclosure: Identification, Premium Loss and Mechanisms. *China Ind. Econ.* **2023**, *01*, 132–150. <https://doi.org/10.19581/j.cnki.ciejournal.2023.01.021>.
64. Wu, F.; Hu, H.Z.; Lin, H.Y.; Ren, X. Enterprise Digital Transformation and Capital Market Performance: Empirical Evidence from Stock Liquidity. *Manag. World* **2021**, *37*, 130–144+110. <https://doi.org/10.19744/j.cnki.11-1235/f.2021.0097>.
65. Yuan, C.; Xiao, T.S.; Geng, C.X.; Sheng, Y. Digital Transformation and Division of Labor between Enterprises: Vertical Specialization or Vertical Integration. *China Ind. Econ.* **2021**, *09*, 137–155. <https://doi.org/10.19581/j.cnki.ciejournal.2021.09.007>.
66. Zhao, C.Y.; Wang, W.C.; Li, X.S. How Does Digital Transformation Affect the Total Factor Productivity of Enterprises? *Financ. Trade Econ.* **2021**, *42*, 114–129. <https://doi.org/10.19795/j.cnki.cn11-1166/f.20210705.001>.
67. Ma, C.; Zhang, J.R.; Yang, B. The Effect of Financial Restatement on Auditor Dismissal. *Account. Res.* **2016**, *5*, 79–86+96.
68. Zhu, J. Compensation Incentives of Independent Director and Information Disclosure Frauds of Listed Companies. *J. Audit Econ.* **2020**, *35*, 77–86.
69. Liu, G.Y.; Liu, J.Q.; Gao, P.; Yu, J.; Pu, Z. Understanding mechanisms of digital transformation in state-owned enterprises in China: An institutional perspective. *Technol. Forecast. Soc. Change* **2024**, *202*, 123288. <https://doi.org/10.1016/j.techfore.2024.123288>.
70. Tan, Y.C.; Zhu, Z.M.; Zeng, C.; Gao, M. Does external finance pressure affect corporate disclosure of Chinese non-state-owned enterprises? *Int. Rev. Financ. Anal.* **2014**, *36*, 212–222. <https://doi.org/10.1016/j.irfa.2014.01.004>.
71. Zhao, Z.R. Digital Transformation and Enterprise Risk-Taking. *Financ. Res. Lett.* **2024**, *62*, 105139. <https://doi.org/10.1016/j.frl.2024.105139>.
72. Xiao, D.H.; Xu, J.L.; Li, Q.Y. The “Double-Edged Sword” effect of air quality information disclosure policy—Empirical evidence based on the digital transformation of Chinese listed companies. *Energy Econ.* **2024**, *133*, 107513. <https://doi.org/10.1016/j.eneco.2024.107513>.
73. Li, J.L.; Yang, Z.; Chen, J.; Cui, W. Study on the Mechanism of ESG Promoting Corporate Performance: Based on the Perspective of Corporate Innovation. *Sci. Sci. Manag. S.&T.* **2021**, *42*, 71–89. <https://doi.org/10.20201/j.cnki.ssstm.2021.09.005>.
74. Huang, R.; Han, R.Q.; Wang, X.T. Digitalization and Dynamic Productivity Improvement—Evidence from a DEA-Malmquist Analysis. *Account. Res.* **2026**, *1*, 109–124.

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