

The Impact of ESG Information Disclosure on International Trade: A Bibliometric and Empirical Study Based on Alibaba International Station

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Abstract. In recent years, the Environmental, Social, and Governance (ESG) concept has rapidly gained prominence worldwide, becoming a critical indicator of corporate sustainable development. ESG information disclosure, as an essential means for companies to demonstrate their ESG performance, has increasingly influenced international trade. Policies such as the European Union's Corporate Sustainability Reporting Directive (CSRD) have compelled cross-border trading enterprises to enhance ESG transparency. As the world's largest B2B platform, Alibaba International Station serves as a benchmark for small and medium-sized enterprises (SMEs) in their export practices concerning ESG compliance. This study employs empirical analysis based on data from Alibaba International Station to investigate the mechanisms and effects of ESG information disclosure on firms' international trade performance. The findings reveal a weak positive correlation (correlation coefficient = 0.11) between overall ESG scores and export volume. Among the three ESG dimensions, the "Social" (S) component exhibits the highest correlation and the strongest explanatory power regarding export performance. However, the impact of Environmental (E), Social (S), and Governance (G) factors varies significantly.

Keywords: ESG information disclosure; international trade; statistical modeling

1. Introduction

Environmental, Social, and Governance (ESG) represents a sustainable development philosophy aimed at harmonizing human activities with nature while fostering high-quality and comprehensive sustainable growth in human society. ESG principles seek to drive the sustainable development of both the real economy and capital markets while enhancing corporate social responsibility in investment and business operations. However, due to the complexity and broad scope of ESG-related topics, there is no universally accepted global definition of ESG.

With increasing attention to ESG in China, environmental protection, social responsibility, and corporate governance have become key concerns for regulators, investors, and corporate executives. In February 2024, the Shanghai Stock Exchange issued the Guidelines for Listed Companies' Sustainable Development Reports (effective from May 1, 2024), marking the initial establishment of China's ESG disclosure standards. Furthermore, in January 2025, the Shenzhen Stock Exchange published the Guidelines for Sustainable Development Report Preparation, adopting a tiered approach that includes both mandatory baseline

requirements and recommended best practices to provide operational guidance for enterprises.

ESG information disclosure systems serve as crucial platforms for listed companies to embody ESG principles while fulfilling corporate social responsibility and achieving self-regulation. These systems require firms to incorporate non-financial factors—such as environmental, social, and corporate governance considerations—into their operational and management strategies. As a result, investors gain a more comprehensive understanding of investment risks and opportunities, thereby fostering trust in corporate governance. This study finds that ESG information disclosure is closely linked to key themes such as corporate governance and firm value, underscoring its pivotal role in enhancing transparency and promoting ESG practices.

According to the President of NORD Asia-Pacific (2017), firms should strive for the principle of "disclose as much as possible while explaining as little as possible; what is explained this year should require less explanation next year." Globally, policymakers are accelerating efforts to advance ESG principles in alignment with the United Nations Sustainable Development Goals (SDGs), which were adopted by 193 UN member states at the United Nations Sustainable Development Summit in September

2015. Since 2017, the Asset Management Association of China (AMAC) has been developing ESG research initiatives. Additionally, since the inclusion of A-shares in the MSCI Index in 2018, MSCI has conducted regular ESG ratings for all index-listed firms, further standardizing ESG disclosure practices.

1.1 Research Background

Information disclosure is a fundamental component of ESG research. Early studies primarily focused on how firms disclose environmental and social information. Over time, research has increasingly emphasized the standardization and comparability of disclosures, highlighting transparency as a key factor. More recently, technological advancements—such as big data analytics and blockchain—have been explored for their potential to enhance the accuracy and timeliness of ESG disclosures.

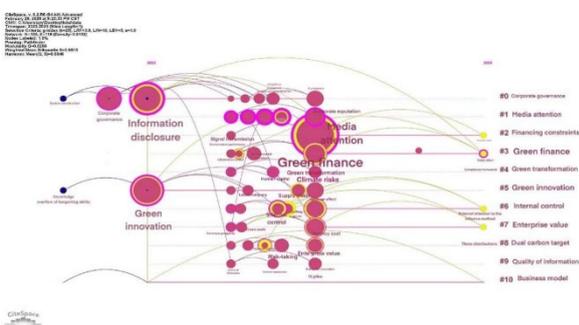


Figure 1: Timeline of ESG-Related Literature (2023–2025)

This study employs CiteSpace to conduct a keyword co-occurrence analysis of ESG-related literature from 2023 to 2025, aiming to identify research hotspots and structural characteristics in this field. The analysis comprises $N=125$ nodes and $E=118$ edges, yielding a network density of 0.0152. The largest connected component (CC) accounts for 88% of the total network, indicating strong internal linkages among research themes. The Pathfinder algorithm was applied to refine the network structure, improving readability.

Each node in the co-occurrence network represents a keyword, with larger nodes signifying greater research influence. The connecting lines between keywords indicate their co-occurrence relationships in academic literature. Key observations from the network include several high-frequency keywords, such as “financing constraints,” “information disclosure,” and “green innovation.” Additionally, terms like “green finance” and “agency costs” also hold significant positions within the network.

Using CiteSpace’s temporal mapping analysis, we categorize ESG research into three distinct phases:

1. Early Development Phase (2017–2018): Initial studies primarily focus on green finance.
2. Active Research Phase (2019–2021): The scope expands to include corporate value, information disclosure, corporate governance, operational risks, and firm performance.
3. Rapid Growth Phase (2022–2023): Interest shifts toward external supervision, financing constraints,

green innovation, internal control, and digital transformation.

Before 2022, ESG research was relatively sparse, with most studies centering on green finance. However, research evolved into a mix of qualitative and quantitative methodologies. After 2022, as ESG ratings began influencing corporate green transformation, research topics expanded to include external supervision, financing constraints, green innovation, internal control optimization, and digital transformation. Consequently, the volume of ESG-related literature increased significantly, with research themes becoming more diverse.

The temporal mapping analysis reveals the dynamic evolution of ESG research, highlighting several key trends:

1. Expansion from corporate governance and information disclosure to broader themes such as green finance and green innovation.
2. Shift from theoretical exploration to practical applications, emphasizing the role of policies and market mechanisms in promoting ESG development.
3. Transition from single-dimensional to multi-dimensional perspectives, focusing on the interactions and synergies among different ESG components.
4. Broader international perspectives, underscoring the importance of global cooperation in advancing ESG principles.

2. The Current State of ESG Information Disclosure on Alibaba International Station

2.1 The Development Status of Corporate ESG Practices

Alibaba Group Holding Limited, founded in 1999, currently operates multiple platforms, including Taobao (C2C), Tmall (B2C), 1688 (Domestic B2B), Alibaba International Station (Global B2B Cross-border E-commerce Platform), and AliExpress (B2C Cross-border Retail). These platforms provide end-to-end e-commerce services both domestically and internationally.

According to the Alibaba Group Environmental, Social, and Governance (ESG) Report 2024, published in 2024, the company has released three consecutive ESG reports—in 2022, 2023, and 2024. The 2022 ESG report, Alibaba’s first comprehensive ESG disclosure, outlined seven long-term strategic directions, collectively referred to as “Alibaba’s ESG Seven-Petaled Flower”. Each business unit within the group was encouraged to explore ESG strategies tailored to its unique operational characteristics. Additionally, ESG has been positioned as a crucial governance and value integration link between the holding company and its subsidiaries.

In 2021, Alibaba set an ambitious environmental target: achieving carbon neutrality across its operations by 2030 and reducing the carbon emission intensity of its value chain by 50%. Moreover, it pledged to drive a 1.5-billion-

ton carbon reduction within its ecosystem over the next 15 years.

In its latest ESG disclosure, Alibaba Group CEO Wu Yongming stated in July 2024 that “the core of ESG is about becoming a better company.” He highlighted key achievements over the past year, including a 5.0% reduction in operational net emissions, from 4.681 million tons in the previous year to 4.449 million tons. Additionally, the company made significant progress in

renewable energy usage, reaching a clean electricity utilization rate of 39.0%.

During Q3 of the 2025 fiscal year, Alibaba reported revenue of RMB 280.15 billion, marking an 8% year-over-year growth. Operating profit surged 83% to RMB 41.21 billion, while net profit skyrocketed 333% to RMB 46.43 billion. Within this, Alibaba International Digital Commerce Group (AIDC) contributed RMB 37.76 billion, reflecting a 32% year-over-year increase, primarily driven by strong cross-border e-commerce performance.

Table 1: Revenue Breakdown for the Three Months Ending December 31, 2024 (Source: finance.sina.com.cn)

| Category | 2023 (RMB in millions) | 2024 (RMB in millions) | 2024 (USD in millions) | % Year-over-Year Change |
|-------------------------------------------------------------|------------------------|------------------------|------------------------|-------------------------|
| Tao Day Group | | | | |
| One Account Management | 92,113 | 100,790 | 13,808 | 9% |
| Always camp and others | 31,649 | 28,726 | 3,935 | (9%) |
| Chinese wholesaler | | | | |
| Table Tao Day Group | 5,308 | 6,575 | 901 | 24% |
| Tao Day Group total | 129,070 | 136,091 | 18,644 | 5% |
| Ali International Digital Business Group | | | | |
| International retail and pro-international wholesaler vegan | 23,260 | 31,553 | 4,323 | 36% |
| Wholesaler vegan | 5,256 | 6,203 | 850 | 18% |
| Ali International Digital Business Group total | 28,516 | 37,756 | 5,173 | 32% |
| Cloud intelligence fruit group | 28,066 | 31,742 | 4,349 | 13% |
| Cainiao Group | 28,476 | 28,241 | 3,869 | (1%) |
| Local Living Group | 15,160 | 16,988 | 2,327 | 12% |
| Big Entertainment Group | 5,040 | 5,438 | 745 | 8% |
| All others called Undivided | 47,023 | 53,102 | 7,275 | 13% |
| Undivided | 374 | 590 | 81 | — |
| Partial foreclosure | (21,377) | (29,794) | (4,082) | — |
| Consolidated income | 260,348 | 280,154 | 38,381 | 8% |

As shown in Table 1, Alibaba’s expansion through strategic acquisitions (e.g., Lazada, Trendyol, Daraz) and self-operated platforms (e.g., AliExpress, Alibaba International Station) has solidified its presence in Southeast Asia, Europe, and the Middle East, helping to globalize “Made in China”. In addition to its carbon neutrality commitments, Alibaba has invested in green logistics and renewable energy, further strengthening its ESG credentials. These initiatives not only enhance its global brand image but also directly and indirectly support over 40 million jobs in China, particularly by providing digital transformation tools for SMEs.

In summary, Alibaba Group maintains a comprehensive ESG disclosure framework and vast platform data, making its research findings highly generalizable. Therefore, Alibaba International Station was selected as the research object for this study. Through literature review, bibliometric analysis, and empirical research, we utilize data from Alibaba International Station and professional databases such as CSMAR to examine the impact of ESG on international trade.

2.2 Literature Review and Bibliometric Analysis

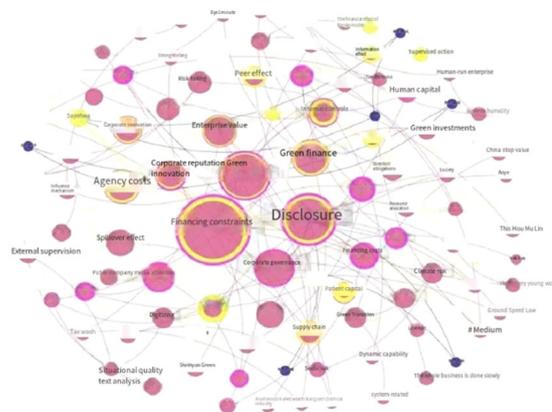


Figure 2: Evolution Pathway and Dynamic Trends of ESG Research (2023–2025) Keyword Co-occurrence Network

This study utilizes CiteSpace for a keyword timeline analysis to explore the evolutionary pathways and dynamic trends of ESG research. The study covers the period 2023–2025, with the network parameters set as follows: network size ($N=125$), edges ($E=118$), density (0.0152), and node labeling ratio (1.0%). The Pathfinder algorithm was employed to enhance visualization clarity. The modularity (Q) score is 0.8606, and the weighted mean silhouette score is 0.9515, indicating high clustering quality and clear thematic structures.

The figure presents 11 major keyword clusters, each representing a distinct research theme, arranged in chronological order with corresponding thematic labels on the right: #0 Corporate Governance, #1 Media Attention, #2 Financing Constraints, #3 Green Finance, #4 Green Transition, #5 Green Innovation, #6 Internal Control, #7 Firm Value, #8 Dual Carbon Targets, #9 Information Quality, #10 Business Model. From the temporal distribution, it is evident that between 2023 and 2025, research focus has progressively shifted from traditional topics such as corporate governance and financing constraints toward emerging areas like green finance, green innovation, and carbon neutrality objectives, highlighting the increasing importance of environmental governance and corporate sustainability in ESG research.

Based on the CiteSpace visualization, it is clear that keywords related to "E" (Environmental) dimensions, such as green finance and green innovation, occupy a central position in the research network, underscoring the growing significance of sustainable development principles in ESG studies. Research on green finance predominantly explores how financial instruments can promote environmental protection and sustainable growth. ESG principles advocate for corporate development that prioritizes environmental protection, integrates social responsibility into business practices, and ultimately strengthens corporate governance to achieve sustainable development—serving as the foundation of corporate core values. As a crucial mechanism for achieving dual carbon targets, green finance facilitates financial support for enterprises, fostering new productive forces in sustainability-driven industries. The analysis also indicates a positive relationship between ESG performance and green innovation capabilities—firms with stronger ESG performance tend to exhibit greater green innovation potential. Furthermore, digitalization serves as a mediating factor, amplifying the impact of ESG performance on green innovation. As shown in the visualization, green innovation is closely linked to corporate innovation, environmental regulations, and resource efficiency, highlighting its pivotal role in achieving ESG objectives.

Additionally, financing constraints are closely related to keywords such as information disclosure and corporate governance, suggesting that financing constraints significantly influence corporate ESG performance. Strong ESG performance alleviates financing constraints, while total factor productivity (TFP) and institutional investor ownership play moderating roles in how ESG performance mitigates financing constraints. The study also reveals that Alibaba International Station's ESG performance demonstrates heterogeneity in its impact on corporate financing constraints, with varying degrees of influence across different business models.

Through bibliometric analysis of Alibaba International Station, the study identifies green finance, green innovation, financing constraints, information disclosure, corporate governance, firm value, corporate innovation, environmental factors, supply chain management, and media attention as the core domains of ESG research. However, there is a notable gap in interdisciplinary research, with limited studies integrating ESG with international trade frameworks.

By analyzing the CiteSpace-generated keyword co-occurrence network, the key ESG research areas and their interconnections become evident. Keywords such as green finance, green innovation, financing constraints, information disclosure, corporate governance, firm value, corporate innovation, environmental factors, supply chain management, and media attention significantly contribute to ESG research. These keywords not only reflect the current research trends but also highlight theoretical gaps in the ESG field. The findings suggest that future ESG research should emphasize interdisciplinary integration, incorporating theoretical and methodological frameworks from economics, management, sociology, environmental science, and statistics. Specifically, more targeted research is needed to analyze ESG's impact within international trade contexts, addressing its sector-specific implications.

3. Empirical Analysis

3.1 Data Sources and Variable Descriptions

In constructing the empirical analysis framework for this study, the selection of variables is based on a comprehensive analysis of the multiple factors influencing firms' export volumes. To precisely explore the intrinsic relationships between these factors and export performance, a set of targeted and representative variables was selected.

Table 2: Variable Descriptions

| Variable | Symbol | Description | Unit |
|---------------------------|--------|-----------------------------------------------------------------------------------------------------------------|-------------|
| Export Volume | VOE | Measures the scale of a firm's exports | Billion CNY |
| ESG Score | ESG | Firm's overall ESG rating, reflecting its performance in environmental, social, and governance dimensions | - |
| E Score | E | Firm's rating on environmental protection, resource utilization, and related areas | - |
| S Score | S | Firm's rating on social responsibility, employee relations, and related factors | - |
| G Score | G | Firm's rating on corporate governance, risk management, and related areas | - |
| Firm Size | SCA | Reflects the firm's operating scale, usually associated with market influence and resource access | Billion CNY |
| Complaint Rate | CPR | Represents customer satisfaction and product quality issues, serving as a key indicator of corporate reputation | % |
| R&D Investment | RD | Reflects the firm's innovation capacity and technological investment level | Million CNY |
| Firm Age | AGE | Reflects the firm's development trajectory and market experience | Years |

As shown in Table 2, this study primarily sources data from Alibaba International Station, a globally recognized cross-border e-commerce platform. This platform aggregates extensive transaction data and operational information from firms across various industries and sizes, providing a rich dataset for research. Key variables such as export volume, firm size, and complaint rate are derived directly from Alibaba International Station, ensuring data accuracy and completeness. However, to address missing data issues, this study also incorporates

CSMAR (China Stock Market & Accounting Research Database), which offers authoritative financial and economic datasets. By integrating data from Alibaba International Station and CSMAR, the study enhances the comprehensiveness, reliability, and credibility of the research findings.

3.2 Descriptive Statistical Analysis

Table 3: Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------|-----|--------|-----------|-------|---------|
| VOE | 645 | 2.74 | 2.09 | 0.33 | 13.13 |
| ESG | 645 | 80.83 | 4.04 | 65.11 | 88.22 |
| E | 645 | 72.27 | 5.23 | 58.60 | 89.43 |
| S | 645 | 77.76 | 5.89 | 60.59 | 90.37 |
| G | 645 | 86.98 | 6.20 | 56.05 | 96.52 |
| SCA | 645 | 6.52 | 0.86 | 4.25 | 8.69 |
| CPR | 645 | 414.05 | 448.45 | 6.37 | 2259.45 |
| RD | 645 | 0.65 | 0.31 | 0.15 | 1.47 |
| AGE | 645 | 2.30 | 0.40 | 1.40 | 3.65 |

As shown in Table 3, the descriptive statistical analysis includes 645 observations, ensuring the robustness and representativeness of the study. The average export volume is 2.74 billion CNY, with a standard deviation of 2.09 billion CNY, indicating significant variation across firms. The minimum export volume is 0.33 billion CNY, while the maximum reaches 13.13 billion CNY, reflecting substantial differences in product competitiveness, market channels, and brand influence among firms. The mean ESG score is 80.83, with individual E, S, and G scores averaging 72.27, 77.76, and 86.98, respectively. The standard deviations suggest considerable heterogeneity in firms' ESG performance, indicating room for improvement across environmental, social, and governance dimensions.

Firm size has a mean of 6.52 billion CNY, with a relatively low standard deviation (0.86 billion CNY),

suggesting that most firms operate within a certain size range, though some significant differences exist. The complaint rate (CPR) has a mean of 414.05%, with an exceptionally high standard deviation of 448.45%, and values ranging from 6.37% to 2259.45%, highlighting severe disparities in product quality and customer satisfaction among firms.

R&D investment averages 0.65 million CNY, and firm age averages 2.30 years, with notable variations, indicating that differences in innovation capacity and market experience may influence export performance.

3.3 Correlation Analysis

Table 4: Correlation Matrix

| | VOE | ESG | E | S | G | SCA | CPR | RD | AGE |
|-----|-------|-------|-------|-------|-------|-------|-------|------|------|
| VOE | 1.00 | | | | | | | | |
| ESG | 0.11 | 1.00 | | | | | | | |
| E | 0.11 | 0.38 | 1.00 | | | | | | |
| S | 0.23 | 0.67 | 0.15 | 1.00 | | | | | |
| G | -0.04 | 0.82 | 0.04 | 0.22 | 1.00 | | | | |
| SCA | -0.21 | -0.15 | 0.26 | -0.19 | -0.19 | 1.00 | | | |
| CPR | -0.07 | -0.14 | 0.16 | -0.34 | -0.04 | 0.53 | 1.00 | | |
| RD | 0.47 | 0.09 | -0.07 | 0.01 | 0.15 | -0.02 | 0.49 | 1.00 | |
| AGE | 0.08 | 0.21 | -0.10 | 0.09 | 0.29 | -0.16 | -0.04 | 0.20 | 1.00 |

As shown in Table 4, the correlation analysis reveals the linear relationships between variables and export volume (VOE).

- **ESG score and VOE show a weak positive correlation (0.11)**, indicating that improving ESG performance has **somewhat of a positive impact** on export volume, though other factors may also play a significant role.
- **The S (social) score has the strongest positive correlation with VOE (0.23)**, suggesting that **better social responsibility and employee relations** are associated with **higher export volumes**.
- **G (governance) score is weakly negatively correlated with VOE (-0.04)**, implying that improving governance alone may not necessarily lead to higher exports.
- **Firm size (SCA) is negatively correlated with VOE (-0.21)**, contrary to traditional expectations. This may indicate that some SMEs, despite their smaller scale, excel in export markets due to **operational flexibility and innovation**

advantages, while some large enterprises may face constraints related to **bureaucracy and slow market responses**.

- **Complaint rate (CPR) is negatively correlated with VOE (-0.07)**, meaning **firms with lower complaint rates tend to have better export performance**, reinforcing the importance of **product quality and customer satisfaction** in international markets.
- **R&D investment (RD) has the strongest positive correlation with VOE (0.47)**, emphasizing the **critical role of technological innovation in enhancing product competitiveness and expanding export markets**.
- **Firm age (AGE) has a weak positive correlation with VOE (0.08)**, suggesting that **longer market presence can contribute to export growth**, though it is not a decisive factor.

3.4 Baseline Regression Analysis

Table 5: Univariate Baseline Regression Results

| Variable | Model (1) | Model (2) | Model (3) | Model (4) |
|-----------------------------------------------------|-----------|-----------|-----------|-----------|
| Dependent Variable: VOE | | | | |
| ESG | 0.058*** | | | |
| (0.021) | | | | |
| E | | 0.046*** | | |
| (0.017) | | | | |
| S | | | 0.083*** | |
| (0.015) | | | | |
| G | | | | -0.015 |
| (0.012) | | | | |
| Constant | -1.973 | -0.561 | -3.700*** | 4.059*** |
| (1.698) | (1.228) | (1.152) | (1.043) | |
| N | 645 | 645 | 645 | 645 |
| Adj. R ² | 0.011 | 0.012 | 0.053 | 0.000 |
| F | 7.633 | 7.120 | 30.780 | 1.598 |
| <i>Standard errors in parentheses</i> | | | | |
| <i>p < 0.10, ** p < 0.05, *** p < 0.01</i> | | | | |

As shown in Table 5, the univariate regression results use export volume (VOE) as the dependent variable while separately regressing ESG and its sub-dimensions (E, S, G).

- ESG, E, and S scores are all positive and statistically significant at the 1% level, indicating that higher overall ESG performance, environmental

efforts, and social responsibility contribute significantly to export growth. For example, enhanced environmental practices may help firms meet global green standards, thereby expanding export opportunities. Similarly, strong social responsibility initiatives can enhance corporate reputation, increasing international market acceptance.

- G (governance) score is negative (-0.015) and statistically insignificant, suggesting that corporate governance improvements alone do not necessarily boost export volumes. This could be due to complex governance mechanisms that do not directly translate into export competitiveness.

- The adjusted R² values vary, with Model (3) (S score) showing the highest explanatory power (Adj. R² = 0.053, F = 30.780). This indicates that social responsibility (S) plays a more critical role in influencing export performance compared to other ESG dimensions.

Table 6: Multivariate Baseline Regression Results

| Variable | Model (5) | Model (6) | Model (7) | Model (8) |
|--------------------------------|------------|------------|------------|-----------|
| Dependent Variable: VOE | | | | |
| ESG | 0.067*** | | | |
| (0.018) | | | | |
| E | | 0.100*** | | |
| (0.012) | | | | |
| S | | | 0.089*** | |
| (0.015) | | | | |
| G | | | | -0.024** |
| (0.011) | | | | |
| SCA (Firm Size) | 0.706*** | 0.531*** | 0.649*** | 0.620*** |
| (0.138) | (0.135) | (0.127) | (0.147) | |
| CPR (Complaint Rate) | -0.004*** | -0.004*** | -0.003*** | -0.004*** |
| (0.000) | (0.000) | (0.000) | (0.000) | |
| RD (R&D Investment) | 7.237*** | 7.542*** | 6.928*** | 7.273*** |
| (0.456) | (0.452) | (0.430) | (0.469) | |
| AGE (Firm Age) | 0.948*** | 0.945*** | 1.061*** | 1.000*** |
| (0.211) | (0.193) | (0.211) | (0.221) | |
| Constant | -11.915*** | -12.765*** | -13.224*** | -4.078** |
| (2.176) | (1.568) | (1.839) | (1.798) | |
| Observations | 413 | 413 | 413 | 413 |
| Adjusted R² | 0.551 | 0.598 | 0.583 | 0.541 |
| F | 68.632 | 81.538 | 81.197 | 66.870 |

As shown in Table 6, the multivariate regression models incorporate additional control variables, including firm size (SCA), complaint rate (CPR), R&D investment (RD), and firm age (AGE).

- ESG, E, and S scores remain positive and significant, confirming their positive impact on export volume even after controlling for other factors.
- G (governance) score is now significantly negative at the 5% level, suggesting that corporate governance improvements may have an indirect or complex effect on export performance when other firm-level factors are considered.
- Firm size (SCA) is positively significant, implying that larger firms tend to export more, likely due to better resource access and market reach.
- Complaint rate (CPR) is significantly negative, reinforcing the importance of customer satisfaction and product quality in international trade success.
- R&D investment (RD) is strongly positive, highlighting the role of innovation in enhancing export competitiveness.
- Firm age (AGE) remains positively significant, indicating that longer operational experience contributes to stronger export performance.
- Adjusted R² values range from 0.541 to 0.598,

demonstrating relatively strong explanatory power for these models.

3.5 Heterogeneity Analysis

Table 7: Firm Size Heterogeneity Test

| Variable | Model (9) (SMEs) | Model (10) (Large Firms) |
|-------------------------------|------------------|--------------------------|
| ESG | 0.063*** | 0.002 |
| (0.013) | (0.008) | |
| SCA | 0.345*** | 0.352*** |
| (0.131) | (0.049) | |
| CPR | 0.005*** | -0.000 |
| (0.001) | (0.000) | |
| RD | 4.745*** | 2.070*** |
| (0.318) | (0.220) | |
| AGE | 0.782*** | -0.726*** |
| (0.211) | (0.110) | |
| Constant | -8.771*** | -0.951 |
| (1.472) | (0.766) | |
| Observations | 203 | 162 |
| Adjusted R² | 0.827 | 0.672 |
| F | 294.791 | 68.574 |

Table 7 shows that ESG performance significantly enhances exports for SMEs (0.063*) but has no significant effect on large firms (0.002). This suggests that SMEs benefit more from strong ESG performance, potentially due to increased access to external resources (e.g., funding and partnerships). For large firms, ESG improvements may have diminishing marginal returns, as they already hold strong

market positions and established international trade networks.

4. Conclusion and Recommendations

Based on data from enterprises on Alibaba International Station, this study conducts an empirical analysis of the impact of ESG factors on corporate export performance, revealing that ESG disclosure is profoundly reshaping the rules and dynamics of international trade. For Alibaba International Station, high-quality ESG information disclosure is not only a compliance requirement but also a key tool for enhancing competitiveness and gaining market trust. By drawing from Alibaba Group's ESG practices and aligning them with the characteristics of Alibaba International Station, the platform can achieve breakthroughs in the environmental, social, and governance (ESG) dimensions, guiding merchants and cross-border trade toward green and sustainable transformation. Ultimately, ESG performance is expected to become the third pillar of competitiveness for Alibaba International Station, alongside price and quality.

The study yields several key findings. First, the impact of ESG as a whole and its subcomponents on export volume varies. The overall ESG score exhibits a weak positive correlation with export volume, indicating that improving ESG performance contributes to export growth. Among ESG subcomponents, the S (social) score has the strongest correlation with export volume, suggesting that corporate social responsibility, such as ethical labor practices and employee relations, significantly enhances export performance by improving corporate reputation and gaining international market recognition. The E (environmental) score also has a significant positive impact on export volume, as firms that implement environmental protection measures and align with international sustainability standards are more likely to expand into foreign markets. However, the G (governance) score does not show a significant impact on export volume in univariate regression analysis, while in multivariate regression, it exhibits a negative relationship with export performance. This finding indicates that corporate governance improvements may not directly translate into export growth, possibly due to complex interactions with other factors.

Second, multiple factors influence export performance, including firm size, R&D investment, firm age, and complaint rate. In multivariate regression, firm size is positively associated with export volume, indicating that larger firms tend to have greater export potential. However, in correlation analysis, firm size is negatively related to export volume, suggesting that some small and medium-sized enterprises (SMEs) perform exceptionally well in exports due to their operational flexibility and innovation capabilities. R&D investment is strongly and positively correlated with export volume, underscoring the critical role of technological innovation in enhancing product competitiveness and penetrating international markets. Firm age exhibits a weak positive correlation with export volume, suggesting that longer operational experience may provide firms with valuable resources and

networks to support export growth. Complaint rate is negatively correlated with export performance, indicating that reducing customer complaints and improving product quality are crucial for export success.

Third, heterogeneous effects are evident across different firm sizes and industries. Regarding firm size, ESG scores have a significant positive impact on export volume for SMEs, while their effect on large firms is insignificant. SMEs, which often face resource constraints, benefit more from strong ESG performance as it enhances their access to external support, including funding and market partnerships, thereby boosting export opportunities. In contrast, large firms already have established market positions, reducing the marginal impact of ESG improvements on their exports. Firm size positively affects export volume for both SMEs and large firms, but the scale effect is more pronounced for large enterprises. The complaint rate has a significant negative impact on SME export performance but is insignificant for large firms, suggesting that SMEs are more sensitive to customer feedback, while large firms can leverage their brand strength to mitigate reputational risks. R&D investment positively affects export volume for both SMEs and large firms, but its marginal contribution is greater for SMEs, indicating that technological innovation plays a more decisive role in helping smaller firms compete internationally. Firm age positively affects SME export performance but negatively impacts large firms, suggesting that longer operational history may create inertia in large enterprises, hindering their ability to adapt to changing global trade conditions.

Regarding industry type, ESG scores have a positive impact on export performance for both manufacturing and service firms, but the effect is more pronounced in the manufacturing sector. Manufacturing firms face stricter environmental regulations and social responsibility expectations, making strong ESG performance a key factor in meeting global market standards and enhancing product competitiveness. In contrast, service firms primarily rely on service quality and customer experience, meaning that ESG dimensions such as environmental sustainability have a more indirect impact on their export performance. Firm size significantly influences export volume in the manufacturing sector but has an insignificant effect on service firms, reflecting the economies of scale in manufacturing versus the customization-driven nature of service industries. The complaint rate affects manufacturing and service firms differently—for manufacturing firms, lower complaints improve export performance as product quality directly impacts customer satisfaction and brand reputation. However, in the service sector, higher complaint rates may be associated with active customer engagement and feedback mechanisms, which, when managed effectively, can enhance customer loyalty and drive export growth. R&D investment positively influences export performance in both manufacturing and service firms, but the impact is stronger in manufacturing, where technological advancements directly translate into product innovation and competitiveness. Firm age positively affects both manufacturing and service firms, but its marginal impact is greater in the service sector,

where longer operational experience helps build brand reputation and customer trust.

Based on the empirical findings, governments, enterprises, and platform operators can adopt the following strategies to promote ESG disclosure and sustainable international trade. Governments should improve ESG-related regulations, encourage firms to strengthen ESG management, and offer tax incentives to firms that adopt sustainable business practices. Policymakers should establish mandatory ESG disclosure standards while providing financial subsidies and tax relief for SMEs, reducing their compliance costs. Enterprises should actively integrate ESG principles into their development strategies, improving ESG performance to enhance international competitiveness. Establishing mutual recognition mechanisms for cross-border ESG certification and aligning with international environmental and social responsibility standards (e.g., ISO 14000, SA8000) can help firms overcome institutional trade barriers.

As a platform, Alibaba International Station should play an intermediary role by establishing an ESG evaluation system, guiding merchants toward higher ESG standards, and promoting green transformation in cross-border trade. SMEs should prioritize social responsibility (S) and environmental (E) disclosure, leveraging green certifications and corporate social initiatives to differentiate themselves in international markets. Large firms should focus on governance (G) transparency, mitigating the risks associated with cross-border regulatory compliance. Manufacturing firms should integrate ESG into supply chain management, adopting low-carbon production techniques, while service firms should emphasize customer-centric social responsibility initiatives, such as privacy protection and ethical service practices.

To further support ESG adoption, Alibaba International Station could develop a dynamic ESG rating system, embedding ESG scores into merchant recommendation algorithms to provide preferential exposure and commission discounts to high-scoring firms. Additionally, the platform could establish an “ESG Capacity Building Center”, offering carbon footprint calculation tools, compliance training, and digital services to help SMEs overcome barriers to ESG implementation.

This study focuses on the impact of ESG factors on export performance in Alibaba International Station, but future research could expand to other e-commerce platforms and industries. A comparative study of Amazon, Global Sources, and other platforms could reveal the generalizability of ESG effects in cross-border e-commerce. Additionally, future research could adopt panel data and case tracking methods to analyze the lagged effects and threshold characteristics of ESG performance on export growth. Incorporating micro-level data, such as consumer preferences and supply chain management, could provide a more comprehensive assessment of ESG’s impact on international trade. Furthermore, integrating consumer preference data and supply chain ESG audits could uncover the transmission mechanisms linking ESG performance, product premium pricing, and export growth.

ESG is reshaping the competitive paradigm of international trade, requiring firms to go beyond compliance and leverage ESG as a strategic asset. Platforms and policymakers should innovate regulatory frameworks and leverage technology to accelerate the transition of ESG from a compliance cost to a competitive advantage.

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