Does Corporate ESG Performance Improve Export Intensity? Evidence from Chinese Listed Firms

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Abstract: Although there have been numerous studies on environment, society, and governance (ESG), its impact on firm export has not often been examined. In this paper, we use the panel data of Chinese listed firms and a newly constructed ESG index to estimate the impact of ESG on firm export intensity. We further test the likely channels through which ESG can affect firm export intensity, including the innovation channel and financing constraints channel. The findings show that corporate ESG performance imposes a significantly positive impact on firm export intensity. The channel analysis shows that ESG influences export intensity through innovation and financing constraints. Lastly, heterogeneity analysis shows that the boosting effect of ESG on firms’ export intensity mainly originates from large firms and state-owned enterprises (SOEs) in the sample. This paper suggests that policymakers should pay attention to ESG, improve ESG information disclosure and give financial support to small non-SOEs.

Keywords: ESG performance; PCA method; export intensity; firm innovation; financing constraints

1. Introduction

Sustainable social responsibility reshapes firms’ business philosophies. Tackling social issues such as climate change, wealth disparity, and infectious diseases is imperative to achieving sustainable development; however, national-level actions are insufficient to address these issues fully. Therefore, firms must focus on and participate in solving these problems and incorporate environmental, social, and governance (ESG) factors into their business philosophies. On the one hand, firms cannot operate without a good external environment; on the other hand, by implementing ESG concepts, firms can establish new competitive advantages, such as green technology and brand reputation. This study investigates the impact of ESG performance on firms’ export intensity from a competitive export advantage perspective. Based on these results, this study proposes and examines the influence mechanism of firm ESG on export intensity.

ESG practices can help firms innovate and improve their relationships with employees, suppliers, and other stakeholders [1]. The current research focuses on the impact of ESG performance on capital cost [2,3], market value [4], and investment decisions [5], and finds that it has positive economic consequences. However, most studies have focused on intra-firm issues, and few have addressed the expansion of firm boundaries. In particular, there are still no clear answers to the question of whether and how ESG affects firms conducting international trade. China is the largest trading country in the world, and Chinese firms experience frequent social responsibility crises in international trade. Often, hidden barriers, such as prior safety checks, ongoing environmental protection, and consumer rights protection, hinder firms’ export behavior. Therefore, it is of great practical significance to explore whether the new competitive advantages established by ESG practices can promote export behavior. This can also enrich ESG and international trade theories.
Using the ESG index and export data from China Customs, we investigated the impact of firms’ ESG performance on export intensity. We further examine the potential influence mechanism of ESG performance on export intensity, including innovation and financing constraint mechanisms [6–9]. Given that China is the world’s largest exporter, new competitive advantages, such as green technology and social reputation established by ESG practices [10,11], significantly impact the export intensity of Chinese firms. The study of this problem helps reshape the business philosophy of firms. The increasingly extensive pursuit of sustainable development has helped firms establish new competitive export advantages [12,13]. In addition, this study’s findings are applicable to exporting firms in other countries.

The contributions of this study are as follows. First, we constructed a firm-level ESG index using a sample of Chinese listed firms. Currently, only one ESG rating index in China measures ESG performance at the firm level. However, the rating method is prone to central tendency errors and lacks specificity. There is no continuous composite index that accurately measures firms’ ESG performance. We selected a series of indicators from three dimensions: the environment, society, and governance. Principal component analysis was conducted for each dimension, and the ESG index at the firm level accurately measured the ESG performance of each firm. In the data-merging process, considering the availability of Chinese customs data, the sample interval was selected as 2008–2015. Second, this study is the first to investigate the relationship between a firm’s ESG and export intensity. Existing ESG studies have focused on firms’ internal issues, and few have addressed the expansion of firm boundaries. ESG studies have focused on intra-firm issues and failed to expand the boundaries of firms. However, non-economic factors, such as the environment and social responsibility in international trade, have received increasing attention. Therefore, studying the relationship between ESG performance and firm export intensity has profound theoretical and practical significance. Third, this study is the first to examine the influence of ESG on export intensity. This study provides theoretical support for accelerating ESG governance and improving ESG information disclosure systems.

The rest of this paper is organized as follows. Section 2 presents the literature review. Section 3 describes the data and methodology used, including data sources, construction of the ESG index, and econometric models. Section 4 presents the empirical results. Finally, Section 5 presents the conclusions and implications of the study.

2. Literature Review and Hypotheses

Our study is related to two streams of the literature. The first focuses on the impact of ESG on firm production and operations. ESG performance affects a firm’s risk, which can affect the cost of capital. Starks et al. [14] proposed that ESG, through multiple channels, can affect many types of risks, including systemic, regulatory, supply chain, product and technology, litigation, reputation, and physical risks. Linsetal. [15] found that during the 2008–2009 financial crisis, firms with high ESG performance outperformed low-ESG firms. ESG enhances firms’ resilience to shock. Albuquerque et al. [16] found that due to product differentiation strategies, firms with high ESG performance face relatively low price elasticity of demand, thereby reducing systemic risks. Seltzer et al. [17] used the Paris Agreement to demonstrate a causal relationship between climate regulatory risk, bond risk, and pricing. Firms with poor environmental performance tended to have relatively low credit ratings. Hoepner et al. [18], Ilhan et al. [19], and Chen et al. [20] proved that ESG activism could reduce a firm’s downside risk.

Good ESG performance reduces the cost of capital, including equity [2] and debt [3]. Flammer [21] demonstrated that the asset advantage and reputational value created by ESG practices provide firms with a significant competitive advantage, as investors and consumers take ESG more seriously. Zerbib [22] finds that green bonds are issued at a negative premium, suggesting that issuing bonds associated with environmental projects lower capital costs. Pastor et al. [23] assumed that ESG preferences exist in an investor’s utility function and analyzed the financial and practical effects of ESG preferences using
a general equilibrium model. They find that firms with good ESG performance have lower capital costs. Empirical studies on the relationship between ESG and capital costs have used various approaches. Chava [24] decomposed the components of ESG and found that firms with poorer environmental conditions have a higher cost of capital. Ng and Rezaee [25] concluded that there is a negative correlation between environmental and governance performance and the cost of equity capital, but that social performance is independent of equity capital costs. Breuer et al. [26] estimated the relationship between a firm’s ESG performance and its cost of capital. The relationship depends on investor protection laws in the firm’s home country. In countries with strong investor protection, higher ESG performance lowers capital costs.

Some studies focusing on the relationship between ESG performance and firm value argue that better ESG performance can increase a firm’s market value [16,27,28]. Influencing mechanisms can be divided into two categories. First, increasing cash flow (e.g., consumers buying goods from firms with a reputation for social responsibility; more productive employees working for such firms) or lowering the discount rate (the lower cost of capital mentioned above) achieves ESG value creation. Second, ESG increases firm value through the shareholder utility maximization channel. For example, shareholders can value environmental or social products while valuing cash flows. Under this valuation method, shareholders of firms with good ESG performance gain more utility [29]. Some studies have reached similar conclusions, using evidence that ESG performance is positively related to stock returns [15,30,31].

Other studies focus on the relationship between ESG performance and disclosure. Wiseman [32] argues there is no correlation between ESG performance and ESG disclosure. However, some scholars believe there is a correlation between these two factors. Bewley and Li [33] showed that firms with higher pollution levels are more likely to disclose conventional environmental information, using Canadian manufacturing firms as an example. Clarkson et al. [34] found a positive correlation between firms’ environmental performance and voluntary environmental disclosure, using 191 firms in the five most polluting industries in the United States. A literature review reveals that existing studies have focused on the impact of ESG performance on firm risk, cost of capital, market value, and the relationship between firm ESG performance and information disclosure. ESG studies have focused on intra-firm issues, and no literature has directly examined the impact of ESG on firms conducting international trade. A small body of the literature examines the impact of environmental regulations or social responsibility on firms’ export behavior.

The second stream concerns factors that influence exports. Many scholars have studied the factors influencing export behavior at different dimensions and levels. As micro-entities of trade, the export intensity of a firm is related to its size, age, foreign capital share, capital stock, product quality, and the sunk cost of exports. Bernard et al. [35] view productivity as the most critical factor affecting a firm’s export growth. Chaney [36] demonstrated that when a firm faces a financing constraint dilemma, the financing constraint potentially determines whether the firm can afford the sunk cost of exports and then determines the firm’s export intensity. Forlani [37] demonstrated that financing constraints restrict firms’ export behavior.

In the context of increasingly prominent social issues related to sustainability, such as climate change and the gap between the rich and poor, more investors and consumers are pursuing sustainable social development [38]. Therefore, the impact of non-economic factors such as environmental regulations and social responsibility on firms’ export behavior has gradually attracted the attention of scholars. On the one hand, the traditional view holds that strict environmental regulations increase compliance costs and reduce firms’ basic productive investment, thus reducing their competitiveness in the international market [39]. However, some studies argue that environmental regulation can force firms to innovate to increase productivity and help them develop a comparative ad-
vantage in trade [40,41]. In addition, the growing emphasis on sustainability has led investors and consumers to invest more in firms committed to sustainable development [42] and to recognize the products of related firms [16].

Following the above discussion and those in the existing literature, we propose the following hypotheses:

H1. Good ESG performance of firms can enhance export intensity.

H1a. Good ESG performance enhances export intensity through innovative mechanisms.

H1b. Good ESG performance enhances export intensity through the financing constraint mechanism.

3. Data Description and Methodology

3.1. The Empirical Model

To empirically investigate the impact of firm ESG performance on export intensity, we used unbalanced panel data of Chinese listed firms from 2008 to 2015 to set the following regression model:

\[ \text{ExpInt}_{ijkt} = \alpha_0 + \alpha_1 \times \text{ESG}_{it} + \alpha_2 \times \text{X}_{ijkt} + \theta_j + \text{year}_t + \epsilon_{ijkt} \]  

Here, \( i,j,k,t \) represent the firm, industry, province, and year, respectively. \( \text{ExpInt} \) is firms’ export intensity. ESG is a firm-level ESG index in China. \( \text{X} \) is the set of control variables. The control variables are typical firm-level characteristics, including firm size, firm age, return on assets, leverage ratio, growth capability, book-to-market value, and firm ownership [43,44]. \( \theta_j \) and \( \text{year}_t \) are industry- and year-specific fixed effects, respectively. \( \epsilon_{ijkt} \) denotes the random disturbance term.

3.2. Measurement of Corporate ESG in China

This study investigated the impact of firms’ ESG performance on export intensity. The key explanatory variable is a firm’s ESG, a comprehensive reflection of the environment, society, and governance dimensions. We constructed a comprehensive ESG index from these three dimensions to measure a firm’s ESG performance. The steps are as follows.

3.2.1. Variables Selection

The environmental aspect reflects the use of resources and pollution. For the environmental dimension, we selected the following variables: whether the company is a key pollution monitoring unit, whether pollutant emissions meet the standards, whether any sudden and significant environmental pollution incidents have occurred, whether any environmental violations exist, whether any environmental petition incidents have occurred, whether the company has passed the ISO9001 environmental management system certification, and whether the environmental management system is in place.

Second, society refers to the firm’s responsibility to shareholders, employees, customers, consumers, and other stakeholders, and the overall consideration of the firm’s internal and external economic, ecological, and social environments to ensure the sustainable development of the firm. In the social dimension, we selected the following variables: whether the firm has formulated a shareholder protection policy, creditor rights protection policy, employee rights protection policy, safety production policy, supplier protection policy, consumer protection policy, GRI Sustainable Development Reporting Guide, environmental and sustainable development, public relations and social welfare undertakings, and social responsibility system construction and improvement measures.
Third, corporate governance is an institutional arrangement that balances stakeholders, such as shareholders, the board of directors, and management [45,46]. In the dimension of governance, we selected the following variables: the nature of the controlling shareholder, whether the chairman and general manager are the same person, the proportion of independent directors, the sum of the squares of the shares held by the top ten major shareholders of the firm, and the ratio of the number of shares held by the director and supervisor to the total number of shares.

3.2.2. PCA Method and Its Analysis

After specific variables selection, principal component analysis (PCA) was carried out in the above three aspects to reduce the dimension. Multiple variables under each aspect were transformed into fewer principal components. The environmental score, social score and governance score of the firm were obtained by weighting the principal components with the variance contribution as the weight. Firstly, the KMO test and Bartlett test were performed on the data to determine whether the variables were suitable for PCA. The KMO test is used to measure the correlation between variables. The larger the KMO value, the stronger the commonality between variables, PCA is more appropriate. The Bartlett test value is the \( p \)-value of the sphericity test. When \( p < 0.05 \), the variables are considered to be correlated. It is possible to conduct a principal component analysis. The results of the KMO test and Bartlett test are shown in Table 1. All KMO values are greater than 0.5. \( p \)-values are all 0.000. This means that PCA applies to our data.

| Variables | Test                        | Value          |
|-----------|-----------------------------|----------------|
| E         | KMO                         | 0.605          |
|           | Bartlett test: Chi-square   | 4425.700       |
|           | Degrees of freedom          | 21             |
|           | \( p \)-value               | 0.000          |
| S         | KMO                         | 0.934          |
|           | Bartlett test: Chi-square   | 101000         |
|           | Degrees of freedom          | 45             |
|           | \( p \)-value               | 0.000          |
| G         | KMO                         | 0.596          |
|           | Bartlett test: Chi-square   | 2282.095       |
|           | Degrees of freedom          | 10             |
|           | \( p \)-value               | 0.000          |

In PCA, eigenvalues greater than 1 are default principal components. Based on Table 2, under the environmental dimension, the number of principal components is 3. The cumulative contribution of these 3 principal components is 56.5%, which is more than 50%. Similarly, under the social dimension, the number of principal components is 2. The cumulative contribution of the two principal components is 71.1%. Under the corporate governance dimension, the number of principal components is 2. The cumulative contribution of the two principal components is 51.9%. The results of the principal component analysis are good.
Taking the environment as an example, the environmental score was obtained:

\[ E_{\text{score}} = \frac{0.232 \times \text{Comp1} + 0.190 \times \text{Comp2} + 0.143 \times \text{Comp3}}{0.232 + 0.190 + 0.143} \]  

(2)

In the same way, we can obtain the social and governance score, S_score, and G_score. The corporate ESG is finally obtained by the weighted average of the scores of these three dimensions.

### 3.3. Data and Variables

This study uses Chinese listed firms as the research sample and excludes financial sector, ST, and ST* firms. Due to the limitations of Chinese customs data, the sample period was selected as 2008–2015. The data were obtained from the Choice, Wind, China Customs, and CSMAR databases.

A firm’s export intensity is the dependent variable in this study. Export intensity is measured as the ratio of the export value to the operating revenue of the firm, reflecting the firm’s export competitiveness. Export intensity is widely used in empirical international business research [47,48]. The advantages of export intensity are as follows: first, export intensity can reflect the export situation of firms and meet the needs of the research problem in this study. Second, export intensity can control for the scale effect of firms to a certain extent. For example, the impact of the same change in export value differs for firms with different operating revenues. Therefore, using export intensity as the explained variable can control for the impact of firm size, thereby enhancing the comparability between firms.

We controlled for firm characteristics to address issues with the omitted variables. Firm size and age can affect the ability to intensify foreign activities [49,50]. Firm size was measured as the log of total assets. Age is the logarithmic value of the firm’s age plus one. Referring to Chalmers et al. [51] and Chang et al. [52], we divided the net profit after tax by total assets to define ROA and used total liabilities divided by total assets to measure...
the leverage ratio. Growth represents a firm’s ability to grow and is proxied by the growth rate of its total assets. We divided book value by market value to define BM [53,54]. SOE is a dummy variable. If the firm was state-owned, it was denoted as 1; otherwise, it was 0.

In this study, we analyzed the impact of ESG on export intensity through innovation and financing constraint mechanisms. Innovation was proxied by the logarithmic value of R&D expenditure plus one. Referring to Hadlock and Pierce [55] and Whited and Wu [56], SA and WW indices were used to measure financing constraints. These two indices were obtained from the CSMAR database. Notably, the SA index is negative; therefore, a smaller value indicates tighter financing constraints for firms. Furthermore, unlike the SA index, a larger WW index implies tighter financing constraints for firms. Table 3 presents the definitions and descriptive statistics for the key variables.

Table 3. Variable definitions and descriptive statistics.

Panel A: Variable Definitions

| Variable | Definition                                      |
|----------|------------------------------------------------|
| ExpInt   | Firm export value/Operating revenue             |
| lnExp    | Logarithmic value of firm export value          |
| ESG      | Environment Society Governance                  |
| Size     | Logarithmic value of total assets               |
| Age      | Logarithmic value of (the age of firm +1)       |
| ROA      | Net profit after tax/Total assets               |
| Leverage | Total liabilities/Total assets                  |
| Growth   | Growth rate of total assets                     |
| BM       | Book value/Market value                         |
| SOE      | Ownership of the firm, 1 if state-owned, 0 otherwise |
| lnRD     | Logarithmic value of (R&D expenditure + 1)      |
| SA       | Refer to Hadlock and Pierce (2010)              |
| WW       | Refer to Whited and Wu (2006)                   |

Panel B: Descriptive statistics

| Variable | N  | Mean  | Sd    | Min   | Median | Max   |
|----------|----|-------|-------|-------|--------|-------|
| ExpInt   | 7259 | 0.062 | 0.137 | 0.000 | 0.000  | 0.677 |
| lnExp    | 7259 | 1.710 | 2.398 | 0.000 | 0.000  | 8.142 |
| ESG      | 7259 | 0.062 | 0.404 | −0.696| 0.079  | 0.974 |
| Size     | 7259 | 21.967| 1.200 | 19.959| 21.768 | 25.768|
| Age      | 7259 | 1.730 | 0.899 | 0.000 | 1.792  | 3.045 |
| ROA      | 7259 | 0.051 | 0.041 | 0.001 | 0.042  | 0.190 |
| Leverage | 7259 | 0.408 | 0.195 | 0.049 | 0.407  | 0.823 |
| Growth   | 7259 | 0.179 | 0.265 | −0.166| 0.114  | 1.692 |
| BM       | 7259 | 0.340 | 0.155 | 0.084 | 0.311  | 0.776 |
| SOE      | 7259 | 0.505 | 0.500 | 0.000 | 1.000  | 1.000 |
| lnRD     | 5566| 17.615| 1.339| 13.913| 17.595 | 21.392|
| SA       | 7259| −3.646| 0.217| −4.225| −3.640 | −3.080|
| WW       | 7257| −1.013| 0.064| −1.204| −1.009 | −0.870|

4. Empirical Results and Analysis

This section investigates the impact of firms’ ESG performance on export intensity and examines the potential influence mechanism of ESG performance on firms’ export intensity. Furthermore, we conducted a heterogeneity analysis and a series of robustness checks.

4.1. Baseline Results
Table 4 presents the baseline regression results. Column (1) reports the estimation results without any control variables, and Column (2) reports the estimation results with a series of firm-level characteristic variables. In Columns (1) and (2) of the regression results, the coefficients of ESG are 0.027 and 0.025, respectively; both are significantly positive at the 1% level. In Column (3), we further control the industry- and year-fixed effects and the coefficient of ESG remains significantly positive. Specifically, the coefficient of ESG is 0.021, indicating that a one-standard-deviation increase in ESG is associated with a 0.85% (=0.021 × 0.404) increase in export intensity. Column (4) reports the different effects of E, S, and G on firms’ export intensity using a series of firm-level characteristic variables. The coefficient of E is 0.032, and the coefficient of S is 0.006, both of which are significantly positive. The coefficient of G is not statistically significant. According to the coefficient value, the environment has the largest effect on firms’ export intensity. In Columns (1) to (3), the coefficients of ESG are significantly positive and close to each other. Therefore, Hypothesis 1 is supported. A good ESG performance can enhance export intensity.

Among the control variables, the coefficients of size, age, ROA, and growth were significantly negative. This indicates that firm size, age, ROA, and growth ability are negatively correlated with export intensity. Aaby and Slater [57] and Bonaccorsi [58] established a negative relationship between firm size and export intensity. Agnihotri and Bhattacharya [59] argued that firm age influences firms’ strategic decisions, and that the older the firm, the more risk-averse the firm becomes. There are economic and exchange risks in exports, so the age of firms has a negative impact on exports. Wang and Ma [60] showed that the impact of growth ability and ROA on export intensity is negative for both high- and low-export-intensity firms. The results of this study are consistent with those of existing studies, indicating that the setting of control variables in this study is reasonable.

Table 4. Baseline results.

| Variables | (1)      | (2)      | (3)      | (4)      |
|-----------|----------|----------|----------|----------|
| ESG       | 0.027 ***| 0.025 ***| 0.021 ** | 0.032 ***|
|           | (0.007)  | (0.008)  | (0.008)  | (0.009)  |
| E         |          |          |          | 0.002    |
|           |          |          |          | (0.005)  |
| S         |          |          |          | 0.006 *  |
|           |          |          |          | (0.004)  |
| G         |          |          |          |          |
|           |          |          |          | (0.005)  |
| Size      | −0.007 **| −0.004   | −0.005   |          |
|           | (0.003)  | (0.004)  | (0.004)  | (0.004)  |
| Age       | −0.012 ***| −0.012 ***| −0.014 ***|          |
|           | (0.004)  | (0.004)  | (0.004)  | (0.004)  |
| ROA       | −0.189 ***| −0.161 **| −0.166 **|          |
|           | (0.072)  | (0.077)  | (0.076)  | (0.076)  |
| Leverage  | −0.035   | −0.036   | −0.036   |          |
|           | (0.025)  | (0.029)  | (0.029)  | (0.029)  |
| Growth    | −0.011 **| 0.029    | −0.013 **|          |
|           | (0.005)  | (0.005)  | (0.005)  | (0.005)  |
| BM        | −0.021   | −0.025   | −0.025   |          |
|           | (0.020)  | (0.027)  | (0.026)  | (0.026)  |
| SOE       | −0.020 **| −0.017 * | −0.019 **|          |
|           | (0.009)  | (0.009)  | (0.009)  | (0.009)  |
| Constant  | 0.060 ***| 0.281 ***| 0.204 ***| 0.237 ***|
|           | (0.004)  | (0.065)  | (0.073)  | (0.075)  |
4.2. Mechanism Analysis

The baseline results show that firms’ good ESG performance can enhance their export intensity. The next step is to investigate the underlying mechanism by which ESG performance affects firms’ export intensity. The positive impact of innovation on exports has long been proven [61–63]. On the one hand, innovation can optimize a firm’s production process and increase productivity. On the other hand, product innovation can increase the variety of export products and form competitive advantages. ESG practices have an incentive to motivate firms to innovate. Therefore, we propose the first mechanism: firms’ good ESG performance enhances their export intensity through innovative mechanisms.

In addition, studies of the impact of ESG on firm operations have widely accepted that good ESG performance reduces the cost of capital and eases financing constraints. However, financing constraints are also an important factor restricting firms’ export behavior. Because firms must bear sunk costs in advance for exports, only firms with loose financing constraints can afford sunk costs and become exporting firms [36]. Therefore, we propose a second mechanism: firms’ good ESG performance enhances export intensity through the financing constraint mechanism. By replacing the dependent variable in Model (1) with the mechanism variables, we studied how ESG performance improves firms’ export intensity. Table 5 shows the regression results. Due to the limitation of paper length, the regression results of control variables are not reported in the subsequent regression results.

Column (1) of Table 5 examines whether ESG performance can affect firms’ export intensity through an innovation mechanism. Innovation lnRD is the dependent variable, and ESG is the key explanatory variable in the regression. We can see that the coefficient of lnRD is 0.124 and significant at the 5% level, indicating that a one-standard-deviation increase in the ESG is associated with an increase of 5% (=0.124 × 0.404) in innovation. The results show that the development of ESG improves firm export intensity. Therefore, ESG imposes a significantly positive impact on firm export intensity through innovation. To maintain and improve environmental performance, firms actively seek green technology and product innovation to reduce environmental pollution and waste emissions during production. In the social performance of firms, a firm’s proactive social responsibility helps establish close ties with stakeholders and obtain resources needed for innovation. In governance, management often faces the problem of shortsighted technological innovation because of the high risk and long cycle of innovation activities. Good governance can alleviate principal–agent conflicts through incentive and restraint mechanisms, prompting management to attach importance to firm innovation and increase investments in research and development. Therefore, innovation is one of the mechanisms through which ESG performance affects export intensity. H1a is supported.

Columns (2) and (3) in Table 5 examine whether ESG performance affects firms’ export intensity through the financing constraint mechanism. Financing constraints were measured using the SA and WW indices. The regression results show that the coefficient of SA is 0.024 and significant at the 5% level, indicating that higher ESG performance would ease financing constraints. Notably, a larger WW index indicates tighter financing constraints for the firms. The coefficient of the WW index is −0.003 and significant at the 5% level. The regression results also show that higher ESG performance alleviates the financing constraints faced by the firm. As a result, we can conclude that ESG influences firm export intensity through financing constraints. A firm’s good ESG performance can
build a good reputation, signal its sound operations, and alleviate information asymmetry, thereby reducing financing costs. One possible reason is that firms must pay certain fixed costs upfront in the export trade. When a firm faces financing constraints, fixed costs upfront can potentially constrain whether it can export and its export behavior. Numerous China-based empirical studies suggest that financing constraints restrict a firm’s ability to export. Therefore, good ESG performance alleviates the financing constraints faced by firms, thereby contributing to increased export intensity. H1b is supported.

In short, the mechanism analysis shows that ESG affects firm export intensity through innovation and financing constraints. Good ESG performance promotes firm innovation and eases financing constraints, therefore increasing export intensity.

| (1) | Innovation | Financing Constraints |
|-----|-------------|----------------------|
| **ESG** | lnRD | 0.124 ** | 0.024 ** |
| | (0.055) | (0.010) | (0.001) |
| **Control Variables** | SA | WW |
| YES | YES | YES |
| YES | YES | YES |
| YES | YES | YES |
| Observations | 5566 | 7259 | 7257 |
| Adjusted R-squared | 0.530 | 0.372 | 0.842 |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. ** denotes variables significant at the 5% level.

4.3. Heterogeneity

The analysis above reveals that good ESG performance can significantly increase a firm’s export intensity. Is there a difference in the impact of ESG on export intensity for firms with different characteristics? We considered the heterogeneous effects of differences in firm size and the nature of firm ownership [64–66] on export intensity. The prerequisite for firms to actively practice the ESG concept is that they have a certain economic strength, can afford the cost of green development, and fulfill social responsibility. For large firms, improving ESG performance has less impact on production and operational costs. For small businesses, improving ESG performance can significantly increase production and operational costs. Similarly, SOEs are usually larger, well-funded, and face less competitive pressure in the market. Therefore, the improvement in ESG performance has less impact on production and operation costs. Non-SOEs are usually small-scale, relatively weak in financial strength, and face greater competitive pressure in the market. The improvement in ESG performance has a greater impact on production and operation costs. Therefore, in the small and non-SOE samples, the increase in ESG performance may have less impact on firms’ export intensity.

In Columns (1) and (2) of Table 6, we divide firms into large and small firms, according to their size, to establish regression equations. Specifically, a firm is defined as large if its size exceeds the median and small otherwise. The regression results indicate that, for large firms, the coefficient of ESG is 0.021 and significant at the 5% level. However, the coefficient of ESG for small firms was not significant. This suggests that the boosting effect of firm ESG performance on export intensity in the benchmark regression mainly originates from the large firms in the sample.

In Columns (3) and (4) of Table 6, we divide firms into SOEs and non-SOEs according to their ownership nature to establish regression equations. The results show that the coefficient of ESG of SOEs is 0.020 and significant at the 5% level. However, the ESG coefficient was not significant for non-SOEs. This also indicates that in the benchmark regression, the promotion effect of firm ESG performance on export intensity mainly comes from
SOEs in the sample. Based on mechanism analysis results, the possible reasons why the ESG coefficient was not significant for non-SOEs are lack of innovation and tight financing constraints. Non-SOEs tend to face more financing constraints and are relatively less innovative due to their size and economic strength, so the boosting effect of ESG on firm export intensity is not significant in terms of non-SOEs.

In Columns (5) and (6) of Table 6, we divide exporting firms into processing and non-processing trades. For processing trade firms, the coefficient of ESG is 0.0321; for non-processing trade firms, the coefficient of ESG is 0.020. The results of the heterogeneity analysis show that the promoting effect of ESG on export intensity is significant for both types of firms.

Table 6. Heterogeneity results.

| Variables               | Large Firm | Small Firm | State-Owned | Non-State | Processing | Non-Processing |
|-------------------------|------------|------------|-------------|-----------|------------|----------------|
| ESG                     | 0.021 **   | 0.020      | 0.020 **    | 0.022     | 0.032 *    | 0.020 ***      |
| (0.010)                 | (0.012)    | (0.010)    | (0.014)     | (0.019)   | (0.007)    |
| Control Variables       | YES        | YES        | YES         | YES       | YES        | YES            |
| Industry FE             | YES        | YES        | YES         | YES       | YES        | YES            |
| Year FE                 | YES        | YES        | YES         | YES       | YES        | YES            |
| Observations            | 3628       | 3630       | 3663        | 3595      | 1086       | 6173           |
| Adjusted R-squared      | 0.161      | 0.060      | 0.130       | 0.059     | 0.161      | 0.070          |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. *, **, and *** denote variables significant at the 10%, 5%, and 1% level, respectively.

4.4. Robustness Checks

We conducted a series of robustness checks on the baseline regression results. First, we considered bias in the estimated results caused by firm entry or exit. During the sample period, we retained a sample of firms that existed for at least two, three, or four years and estimate Model (1). Table 7 shows the regression results. The ESG coefficients are 0.022, 0.023, and 0.026, respectively, and significant at the 1% level. These three coefficients are slightly higher than the ESG coefficient in the benchmark regression (0.021), indicating that the baseline regression results in this study are robust. Therefore, the impact of ESG performance on firms’ export intensity was not overestimated. (We keep samples of firms that have existed for at least 2, 3, or 4 years, which cannot completely eliminate the impact of firm entry or exit. Due to the limitation of the sample, this paper cannot use balanced panel data. However, the results also show that the benchmark regression was not affected by the entry or exit of firms, and does not overestimate the promoting effect of ESG performance on export intensity).
Table 7. Excluding the impact of corporate exits and entrance.

| Variables       | (1)       | (2)       | (3)       |
|-----------------|-----------|-----------|-----------|
| ESG             | 0.022 *** | 0.023 *** | 0.026 *** |
|                 | (0.008)   | (0.009)   | (0.009)   |
| Control Variables | YES      | YES      | YES      |
| Industry FE     | YES      | YES      | YES      |
| Year FE         | YES      | YES      | YES      |
| Observations    | 7175     | 7089     | 6609     |
| Adjusted R-squared | 0.091   | 0.091    | 0.095    |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. *** denotes variables significant at the 1% level.

Second, we replace the dependent variable, export intensity, with the logarithmic value of a firm’s export value. Table 8 shows the regression results. In Columns (1) to (3) of Table 8, the coefficients of ESG are significantly positive. Considering the firm-level control variables, industry, and time fixed effects, the coefficient of ESG is 0.347, which means that a one-unit standard deviation increase in the ESG index is associated with a 14% (=0.347 × 0.404) increase in export intensity. This indicates that the benchmark regression results are robust and that firm ESG performance has a greater impact on the value of firm exports.

Table 8. Explanatory variable replaced by export value.

| Variables       | (1)       | (2)       | (3)       |
|-----------------|-----------|-----------|-----------|
| ESG             | 0.775 *** | 0.551 *** | 0.374 *** |
|                 | (0.132)   | (0.136)   | (0.141)   |
| Control Variables | NO      | YES      | YES      |
| Industry FE     | NO       | NO       | YES      |
| Year FE         | NO       | NO       | YES      |
| Observations    | 7259     | 7259     | 7259     |
| Adjusted R-squared | 0.017   | 0.032    | 0.120    |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. *** denotes variables significant at the 1% level.

Third, we used high-dimensional fixed-effect tests. In general, some unobservable factors in industries and provinces that change over time may affect the promotion effect of ESG on firms’ export intensity. Therefore, we added high-dimensional fixed effects to Model (1) to control for the influence of unobservable factors. Table 9 shows the regression results. Column (1) of Table 9 further controls for province-level fixed effects based on the year and industry fixed effects. Column (2) further controls for industry factors that change over time by adding industry × year fixed effects. Column (3) further controls for province factors that change over time, that is, the addition of province × year fixed effects. In Column (4), we control for industry × year and province × year fixed effects based on the benchmark. The regression results show that improving firms’ ESG performance significantly promotes export intensity. This result is consistent with the benchmark regression, which again proves that the empirical results of this study are robust and reliable.
Table 9. High-dimensional fixed effects.

| Variables          | (1)     | (2)     | (3)     | (4)     |
|--------------------|---------|---------|---------|---------|
| ESG                | 0.020 **| 0.020 **| 0.020 **| 0.020 **|
|                    | (0.008) | (0.008) | (0.008) | (0.009) |
| Control Variables  | YES     | YES     | YES     | YES     |
| Industry FE        | YES     | YES     | YES     | YES     |
| Province FE        | YES     | YES     | YES     | YES     |
| Year FE            | YES     | YES     | YES     | YES     |
| Industry×Year FE   | NO      | YES     | NO      | YES     |
| Province×Year FE   | NO      | NO      | YES     | YES     |
| Observations       | 7259    | 7249    | 7257    | 7247    |
| Adjusted R-squared | 0.119   | 0.094   | 0.100   | 0.074   |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. ** denotes variables significant at the 5% level.

Finally, we used instrumental variables to solve endogeneity problems in the estimation. The main endogeneity problem in this study was reverse causality. One possible reason is that firms with high export intensity have more capital, which improves their ESG performance. In other words, improving ESG performance promotes export intensity, which, in turn, improves firm ESG performance. Moreover, when overseas markets focus more on corporate social responsibility, firms are mainly motivated to improve their ESG performance in overseas markets. Therefore, the instrument variables must satisfy correlation and exogeneity. The instrument variables mainly include the firm’s ESG lagged by one period (L.ESG), average ESG in the same industry excluding this firm (ID_ESG1), and average ESG in the same province excluding this firm (Dis_ESG1). These instrumental variables were highly correlated with firms’ ESG performance. They can only affect firms’ export intensity by affecting their ESG performance, which satisfies the correlation and exogeneity conditions. In Table 10, the first stage regression results of 2SLS show that the instrument variable coefficients of the ESG are significant at the 1% level. The Kleibergen–Paap rk LM statistic passes the significance test at the 1% level, and there is no under-identification problem. Meanwhile, the Kleibergen–Paap rk Wald F-statistics for all three instrumental variables were greater than the critical value of the F-statistic proposed by Stock and Yogo [67], indicating that all three passed the weak identification test. Table 8 shows that the coefficients of ESG were significantly positive. In summary, after solving the endogeneity problem, we find that ESG performance positively affects firms’ export intensity, indicating that the empirical results of this study are robust.
Table 10. Results for instrumental variables.

| Variables | Panel A: First Stage of 2SLS | Panel B: Second Stage of 2SLS |
|-----------|-----------------------------|-------------------------------|
| L.ESG     | ESG 0.747 ***               | ExInt 0.034 ***              |
|           | (0.011)                     | (0.012)                      |
| ID_ESG1   | -0.999 ***                  | 0.021 **                     |
|           | (0.002)                     | (0.009)                      |
| Dis_ESG1  | -0.990 ***                  | 0.018 **                     |
|           | (0.006)                     | (0.009)                      |
| Control Variables | YES | YES | YES |
| Industry FE  | YES | YES | YES |
| Year FE    | YES | YES | YES |

Notes: Standard errors are clustered at the firm level. Robust standard errors are indicated in the parentheses. ** and *** denote variables significant at the 5% and 1% level, respectively.

5. Conclusions

Sustainable development reshapes firms’ business philosophy. ESG practices create new competitive advantages and profoundly impact the export trade. This study examines the impact of firms’ ESG performance on export intensity using the constructed ESG index of Chinese listed firms.

The conclusions of this study are as follows: First, ESG performance has a strong and significantly positive impact on enhancing Chinese firms’ export intensity. Second, the mechanism analysis shows that good ESG performance enhances firms’ export intensity by promoting innovation and alleviating financing constraints. Third, the results of the heterogeneity analysis show that the effect of ESG performance on firms’ export intensity mainly originates from large firms and SOEs in the sample. As a result, policymakers should pay attention to ESG, improve ESG information disclosure and give financial support to small non-SOEs to develop ESG.

The limitation of this paper is that our data cannot distinguish whether firms are purely trading or production firms. Therefore, it is impossible to verify the detailed impact of ESG on the export intensity from the firm trade type. In the future, if relevant data becomes available, we would like to conduct much more analysis.

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