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# Strategic Alignment Perspective on Green Export Strategy and Performance: Evidence From Developing-Country Exporters

Frederick Yinbil Awuni[1] | Nana Dwomoh Osei Bempah[2] | Dominic Essuman[3,4] | Emmanuel Kwabena Anin[5]

[1]Loughborough Business School, Loughborough University, Loughborough, United Kingdom | [2]Department of Accounting, Economics and Finance, University of Derby, United Kingdom | [3]Sheffield University Management School, The University of Sheffield, Sheffield, United Kingdom | [4]Gordon Institute of Business Science, University of Pretoria, Johannesburg, South Africa | [5]Department of Procurement and Supply Chain Management, Kumasi Technical University, Ghana

**Correspondence:** Dominic Essuman (d.essuman@sheffield.ac.uk)

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## ABSTRACT

Green export strategy is essential for developing-country exporters to meet environmental sustainability demands in foreign markets, but it also has cost and inefficiency implications and could undermine export performance, especially if it does not align with internal and external contextual conditions. This study applies the strategic alignment perspective to detail and clarify these complexities characterizing the green export strategy–performance link. The study's hypotheses are tested on survey data from 260 export manufacturers in Ghana using moderated regression analysis. The findings support the hypothesis that green export strategy enhances export performance, especially in foreign markets where customers prioritize green issues. However, contrary to the study's hypothesis, the findings indicate that a greater condition of export responsiveness weakens the export performance benefit of green export strategy. The article presents the implications of these findings for research and practice, emphasizing the importance of a strategic alignment perspective of green strategies.

## 1 | Introduction

Green export strategy (GES), the degree to which a firm's export strategy decisions and activities incorporate environmental sustainability issues, has become a prerequisite for developing-country exporters to deal with the growing environmental regulations and consumer pressures in international markets (Bello-Pintado et al. 2023; Chang 2024; Nguyen et al. 2023). However, the literature suggests that GES can be a double-edged sword. On the one hand, it can offer legitimacy and reputational advantages (Chang 2024; Frimpong et al. 2025). On the other hand, its implementation is costly and complex as it requires changing existing processes and products to meet unique and diverse foreign market requirements (Leonidou et al. 2015; Silva et al. 2023). Highlighting these opposing views, studies examining the economic value of green-related strategies and practices have reached mixed conclusions: some studies find that 'going green' in foreign markets offers economic benefits (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Frimpong et al. 2025; Silva et al. 2023), whereas others report that it does not, in itself, provide economic gains (Al-Ghwayeen and Abdallah 2018; Li and Li 2024; Xu et al. 2018). Research reconciling these opposing views and mixed empirical conclusions is crucial for advancing theory and for providing a clear direction for export firms (Bıçakcıoğlu et al. 2020).

Accordingly, this research addresses the question: *How and when does GES affect the performance of developing-country exporters?* Using a strategic alignment perspective (Walter et al. 2013), we address the 'how' aspect of this question by suggesting that

GES improves export performance by enabling firms to *align* their operations and products with green requirements in foreign markets. We address the 'when' aspect of the question by proposing that the effectiveness of GES in enabling exporters to achieve external 'fit' is greater when they encounter higher levels of foreign customer green concern or demonstrate greater export responsiveness. Green concerns are increasingly global, but their intensity varies across export markets. Accordingly, we posit that emphasizing GES in foreign markets with low green concerns may lead to cost-ineffectiveness (Appiah and Essuman 2024). Additionally, since GES is driven by foreign market demands, export responsiveness can help firms adapt and align their GES with unique and changing requirements in specific foreign markets (Sousa et al. 2024; Zeriti et al. 2014). The study develops and tests these arguments using data from export manufacturers based in Ghana, a developing country.

This study offers three key contributions. First, it reveals two underexplored contingencies (foreign customer green concerns and export responsiveness) that determine when the pursuit of GES drives or reduces export performance. To this end, the study addresses concerns about the limited knowledge of the contingencies underlying the green strategies-export performance link (Bıçakcıoğlu et al. 2020). Second, extending existing theoretical perspectives (e.g., resource-based and stakeholder theories) on the international performance implications of green strategies and practices (Frimpong et al. 2025; Li and Li 2024; Singh et al. 2024), the study uses a strategic alignment perspective to articulate how the concept of 'fit' helps to link GES to differing levels of export performance under specific internal and external contextual conditions. Finally, the study's focus on exporters from a developing country allows it to advance the limited empirical and contextual understanding of the benefits of GES for exporters from underexplored settings (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023). Whereas some studies from developed and emerging countries indicate that green strategies and practices by themselves make no difference in international performance outcomes (e.g., Li and Li 2024; Xu et al. 2018), this study's arguments and findings suggest that GES matters for boosting the performance of exporters from a developing country, all else being equal.

The remainder of this paper is organized as follows. The next section discusses past studies that inform and motivate this study. The study's theoretical foundation and hypotheses are presented afterward. Following this, we discuss the research methodology and data; and then present our empirical analysis and results. The final section discusses the theoretical and practical implications of the study's findings, alongside limitations and avenues for future research.

## 2 | Literature Review

Questions about the performance effects of green strategies and practices in the context of international business (including exporting) have received considerable empirical attention (Table 1). Past studies have examined related green strategies under different labels, such as green export business strategy (Bıçakcıoğlu-Peynirci and Tanyeri 2022), GES (Singh et al. 2024), eco-friendly export marketing strategy (Silva et al. 2023) and environmentally friendly export business strategy (Leonidou et al. 2015). These studies also examine various international or export performance outcomes, such as competitive advantage, market performance and financial performance (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Leonidou et al. 2015). A key conclusion from these studies is that firms face trade-offs between strategic effectiveness and efficiency in their efforts to go 'green' in foreign markets; however, their empirical analyses largely do not account for the contextual factors that narrow or widen such trade-offs.

One stream of studies has used various theoretical lenses, especially resource-based theory (e.g., Silva et al. 2023) and stakeholder theory (e.g., Li and Li 2024), to articulate the strategic effectiveness value of addressing green concerns in foreign markets. The dominant argument is that green strategies and practices not only offer ecological benefits but also economic gains (Al-Ghwayeen and Abdallah 2018). More specifically, the argument is that green strategies and practices support and facilitate strategic effectiveness by improving the capacity of international firms to gain legitimacy, build reputation and achieve competitive advantages, while also lowering penalty costs associated with non-compliance (Chang 2024; Frimpong et al. 2025; Leonidou et al. 2015). This argument has received considerable empirical support (Table 1). For example, Singh et al. (2024) find that GES positively affects the export performance of small and medium-sized enterprises in India, while Bıçakcıoğlu-Peynirci and Tanyeri (2022) report that green export business strategy positively affects the market and financial performance of Turkish export firms.

From a strategic efficiency standpoint, however, the literature recognizes that addressing green issues is cost-intensive and can result in inefficiencies; it could undermine the competitiveness of international firms (Bıçakcıoğlu et al. 2020; Li et al. 2017). Specifically, green strategies often involve costly adaptations, such as changing sourcing practices, redesigning manufacturing processes and products, and disrupting well-established, cost-effective routines. Moreover, pursuing these strategies in foreign markets adds complexity due to the unique requirements of host countries (Silva et al. 2023). Thus, the payoff of green strategies for exporters is not guaranteed (Bıçakcıoğlu et al. 2020). Evidence from some studies highlights this point (Table 1). For example, Leonidou et al. (2015) report that an environmentally friendly export business strategy does not make any difference in cost leadership advantage among Greek exporters. Also, Xu et al. (2018) find that neither energy conservation nor emission reduction directly improves the export performance of Chinese firms.

Some studies have used mediation analysis to clarify the complexities surrounding the international performance implications of green strategies and practices. Arguments and findings from such studies suggest that the contribution of these strategies and practices to international performance outcomes is intervened by firm-specific mechanisms, such as innovation (Li and Li 2024), ISO certification (Xu et al. 2018), international brand orientation (Frimpong et al. 2025) and environmental performance (Al-Ghwayeen and Abdallah 2018). The major insight from these studies is that incorporating relevant mediating mechanisms could provide an enhanced empirical

**TABLE 1** | Sample past studies.

| Authors (year) | Green strategy or other related constructs | Moderator[1]/ Mediator[2] | Export/ international performance variable | Theoretical perspective | Sample and data | Key findings |
|---|---|---|---|---|---|---|
| Bıçakcıoğlu-Peynirci and Tanyeri (2022) | Green export business strategy | | • Export market performance<br>• Export financial performance | Resource-based view | Cross-sectional survey data from 235 Turkish manufacturers | Green export business strategy is positively related to both export market performance and export financial performance. |
| Al-Ghwayeen and Abdallah (2018) | Green supply chain management | Environmental performance[2] | Export performance | Not stated | Cross-sectional survey data from 221 manufacturing firms in Jordan | • When environmental performance is controlled, green supply chain management does not directly relate to export performance.<br>• Environmental performance positively mediates the link between green supply chain management and export performance. |
| Frimpong et al. (2025) | Sustainability orientation | International brand orientation[2] | Post-entry performance | Natural resource-based view | Longitudinal survey data from 288 new international ventures from Ghana | Sustainability orientation positively affects post-entry performance; international brand orientation positively mediates this effect. |
| Silva et al. (2023) | Eco-friendly export marketing strategy | | Export performance | Resource-based view | Cross-sectional survey data from 241 SME manufacturers from Portugal | Eco-friendly export marketing strategy positively relates to export performance |
| Singh et al. (2024) | Green export strategy | | Export performance | Resource-based view | Cross-sectional survey data from 227 SMEs from India | Green export strategy is positively related to export performance |
| Leonidou et al. (2015) | Environmentally friendly export business strategy | | • Export cost leadership competitive advantage.<br>• Export product differentiation competitive advantage | Not stated | Cross-sectional survey data from 216 exporters from Greece | • Environmentally friendly export business strategy positively relates to export product differentiation competitive advantage.<br>• However, it does not relate to export cost leadership competitive advantage. |
| Li and Li (2024) | Environmental management | Innovation[2] | Export performance | Stakeholder theory | Cross-sectional survey data from 226 Chinese manufacturing firms | • Environmental management does not relate to export performance.<br>• Innovation positively mediates the link between environmental management and export performance. |

(Continues)

**TABLE 1** | (Continued)

| Authors (year) | Green strategy or other related constructs | Moderator[1]/ Mediator[2] | Export/ international performance variable | Theoretical perspective | Sample and data | Key findings |
|---|---|---|---|---|---|---|
| Xu et al. (2018) | • Energy conservation<br>• Emission reduction | ISO14001 Certification[2] | Export performance | Stakeholder theory | Longitudinal data from 425 listed companies from environmentally sensitive industries in China | • Neither energy conservation nor emission reduction directly affects export performance.<br>• ISO certification positively mediates links from energy conservation and emission reduction to export performance. |
| Bıçakcıoğlu et al. (2020) | • Green business strategy | Environmental orientation[1]<br>Green human resource assets[1]<br>Green production differentiation[1]<br>Cost leadership[1] | Export financial performance | Resource-based view<br>Contingency theory | Cross-sectional survey data from 224 Turkish manufacturers | • Green business strategy has a positive link with export financial performance.<br>• Environmental orientation positively moderates the link between green business strategy and export financial performance.<br>• Green product differentiation negatively moderates the link between green business strategy and export financial performance.<br>• Cost leadership strategy positively moderates the link between green business strategy and export financial performance. |

understanding of the international performance outcomes of green strategies and practices.

Bıçakcıoğlu et al. (2020), however, demonstrate the importance of adopting a contingency analysis to clarify the conflicting views on the international performance effect of green strategies. Their study of Turkish exporters finds that greater conditions of green product differentiation weaken the positive link between green business strategy and financial performance, whereas greater conditions of cost leadership or environmental orientation strengthen it. Although these findings suggest that the international performance effect of green strategies is context-dependent, the contingency perspective on the green strategy-international performance link is underdeveloped.

This study adopts a strategic alignment perspective to address this limitation, suggesting foreign customer green concern and export responsiveness as moderators of the relationship between GES and export performance. We argue that these moderators are critical for examining when the use of GES by developing-country exporters enhances or reduces their ability to align strategic value propositions with green requirements in foreign markets, and consequently, their level of export performance. The theoretical foundation and hypotheses associated with this argument are presented next.

## 3 | Theoretical Background and Hypotheses

### 3.1 | A Strategic Alignment Perspective on GES

Rooted in strategic management and organizational literature, the strategic alignment perspective builds upon the contingency theory of organizations (Bergeron et al. 2004; Walter et al. 2013). The contingency theory suggests that no single strategy is ideal across all internal and external organizational environments. That is, a strategy may be cost-effective in certain contexts but not in others. According to this theory, high-performing firms are those that pursue strategies aligned with contextual factors (Van de Ven et al. 2013). Beyond the context of international firms (Bıçakcıoğlu et al. 2020), other streams of research have applied the principles of contingency theory to explain the contextual factors that moderate the performance effects of green strategies and practices. For example, supply chain studies reveal that environmental product design improves cost performance in situations where firms emphasize digital orientation (Chavez et al. 2023), while others indicate that green supply chain management contributes more to cost performance in situations where firms emphasize supply chain traceability or eco-centricity (Cousins et al. 2019).

As a contingency theory, the strategic alignment perspective is concerned with the performance effects of the fit between strategy variables and other organizational variables (Sabherwal et al. 2019; Sardana et al. 2016). It specifically emphasizes the strategic benefits of matching a given strategy with prevailing internal or external organizational factors (Sardana et al. 2016; Walter et al. 2013). The core argument of the strategic performance perspective is that superior performance outcomes are a function of (1) the extent to which a given strategy addresses contextual requirements and (2) the extent to which contextual

factors support or facilitate strategy design and implementation. In essence, this perspective recognizes the need to match strategy with appropriate contextual factors to drive export performance (Sabherwal et al. 2019; Walter et al. 2013).

Strategy comprises a set of coherent policies and actions designed to respond to a high-stakes challenge (Teece 2014), such as ecological problems and associated stakeholder requirements (Leonidou et al. 2015). GES constitutes a strategy in that it reflects the degree to which a firm's export decisions and activities are influenced by and respond to green issues (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Banerjee et al. 2003). From the strategic alignment perspective, strategy serves as a means through which a firm seeks to align its operations and outputs with external environment requirements (Venkatraman and Camillus 1984). Applying this logic, Flynn et al. (2010) argue that customer and supplier-focused integration represents a strategy that enhances performance by helping firms align their operations and products with market requirements. This alignment logic underpins GES, which both scholars and practitioners view as a strategy enabling firms to meet the growing green requirements in international markets (Chang 2024; Frimpong et al. 2025; Bıçakcıoğlu-Peynirci and Tanyeri 2022). Accordingly, we begin our research with the following baseline argument: GES provides exporters from developing countries with an enabling capacity to achieve external alignment in foreign markets.

The proposition that green strategies enhance the performance of exporters presumes these firms encounter green concerns in foreign markets (Leonidou et al. 2015; Silva et al. 2023). Moreover, existing theoretical analyses assume that export firms have the equivalent capacity to design and deploy green strategies cost-effectively (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Singh et al. 2024). Analysing these assumptions, we extend our baseline argument by suggesting that the extent to which GES enables exporters to achieve external fit will vary, as green concerns differ across foreign markets and exporters vary in their capability to respond to these market requirements. We specifically adopt a moderation approach for formulating strategic alignment to analyse the boundary conditions of our baseline argument (Venkatraman 1989). We posit that export firms emphasizing GES in foreign markets with heightened customer green concerns will realize superior export performance. We also argue that export firms' emphasis on GES will lead to superior export performance when they can swiftly adapt their export activities to changing foreign market requirements.

### 3.2 | GES and Export Performance

As discussed in Section 2, the existence of competing theoretical explanations and conflicting findings from prior studies suggests the link between GES and export performance may not be straightforward. However, the strategic alignment perspective presented above offers some reasons to believe that the link may be positive, all things being equal. Thus, we develop and test this proposition before analysing its boundary conditions.

In domestic markets, many studies indicate that firms integrating environmental considerations into their operations and products improve market and financial outcomes (Leonidou et al. 2017; Papadas et al. 2024; Gurău and Ranchhod 2005; Oduro and Matarazzo 2024). The rationale behind these performance improvements lies in the ability of firms to address diverse stakeholder concerns regarding environmental protection while pursuing their organizational objectives (Adomako et al. 2023; Ko et al. 2013). Addressing stakeholder green concerns fosters corporate legitimacy, enhances reputation and provides a competitive edge over competitors (Tzanidis et al. 2024), allowing firms using green strategies to penetrate additional customer markets and expand their market share.

Export markets exhibit unique characteristics, including regulatory environments, international environmental issues and green consumer preferences, which necessitate that export manufacturers adopt environmentally friendly practices and offer green products (Leonidou et al. 2017; Zeriti et al. 2014). Consequently, firms that adopt GES are likely to enhance export performance. The underlying reason is that by prioritizing eco-friendly practices, firms align with global environmental standards and market demands while strengthening their reputational capital (Leonidou et al. 2013). GES not only ensures compliance with regulations but also appeals to environmentally conscious consumers, improving exporters' market penetration and revenue-generating potential.

Manufacturing firms often have poor environmental footprints (Jin et al. 2020; Bello-Pintado et al. 2023), and export manufacturers from developing nations, where environmental regulations are weaker, may be viewed as less environmentally friendly. These exporters are likely to experience "liability of foreignness", i.e., potential negative perceptions in host markets regarding their environmental footprint. Therefore, all things being equal, developing-country exporters will not achieve the same legitimacy and reputational advantages as firms from the host or developed countries. Through GES, export manufacturers from developing countries can address issues of liability of foreignness (Bıçakcıoğlu et al. 2020), while also gaining differentiation advantages, ultimately improving their export performance (Dechant and Altman 1994; Leonidou et al. 2015). Additionally, GES can help these firms minimize the costs associated with non-conformance to environmental regulations in foreign markets, thereby strengthening their cost leadership (Leonidou et al. 2015). Aligned with these arguments, some studies suggest that green strategies or practices are positively associated with export or international performance outcomes, including both market- and financial-based performance (e.g., Bıçakcıoğlu-Peynirci and Tanyeri 2022; Frimpong et al. 2025; Silva et al. 2023). Therefore, we test the following hypothesis:

**Hypothesis 1.** *GES has a positive relationship with export performance.*

### 3.3 | Boundary Condition Role of Foreign Customer Green Concern

Hypothesis 1 assumes that GES is necessary for achieving strategic alignment in foreign markets, as green issues increasingly have a global scope. However, research suggests that consumer attitudes towards, demand for and readiness to pay

for green products vary across countries (Global Sustainability Study 2021). Thus, emphasis on GES must be aligned with the degree of foreign customer green concern. Emphasizing GES in foreign markets with low customers' concern for green issues can lead to strategic misalignment and, consequently, lower export performance. Therefore, we expand on Hypothesis 1 to suggest that GES contributes more to export performance when it is emphasized by firms serving foreign markets where customers' concern for green issues is greater.

Foreign customer green concern refers to the extent to which customers in foreign markets prioritize environmental protection and expect firms to do the same (Banerjee et al. 2003). Green-conscious customers often exhibit a heightened sensitivity to issues of environmental protection, thereby exerting pressures on export manufacturers to adopt environmentally sustainable practices (Fraj-Andrés et al. 2009). Consequently, exporters that fail to offer eco-friendly products or whose marketing practices are perceived as environmentally harmful risk facing consumer backlash, which may result in sanctions and reduced sales from environmentally conscious consumers and stakeholders (Cakanlar et al. 2023; Chang et al. 2019; Leonidou et al. 2017). Therefore, it becomes increasingly essential for manufacturers from developing countries serving export markets with significant customer green concerns to emphasize GES to achieve strategic alignment in such markets. In these markets, emphasizing GES is crucial for gaining legitimacy and reputational advantages while also minimizing the risk of environmental fines.

A major drawback of serving foreign markets with heightened green concerns is the additional costs firms incur to design and implement GES to meet those expectations. However, without GES, firms may face costs beyond monetary penalties (e.g., fines), including the loss of customers and market share due to diminished reputation and legitimacy. Taken together, these arguments suggest that GES is more appropriate and likely to generate net positive outcomes when emphasized in foreign markets with greater customer green concern. Conversely, in foreign markets where customer green concern is low, the costs of increasing GES may outweigh the marginal benefits (e.g., sales revenue) it generates. Accordingly, we hypothesize that:

**Hypothesis 2.** *Foreign customer green concern moderates the relationship between GES and export performance, such that this relationship is positive and stronger in foreign markets with higher customer green concern than in those with lower concern.*

### 3.4 | Boundary Condition Role of Export Responsiveness

Like GES, export responsiveness involves cost–benefit tradeoffs, making it challenging to determine what constitutes a strategic fit when considering both concepts in specific organizational contexts. Beyond their investment requirements, both GES and export responsiveness tend to result in changing established organizational processes and products to meet changing foreign market requirements. Such changes, while disruptive to operations, can make firms less efficient (Bıçakcıoğlu et al. 2020; Wagner et al. 2012). The increased financial burden of emphasizing GES and export responsiveness can make exporters from developing countries less competitive, particularly since these firms often lack the financial and technical capacity to sustain such investments.

Yet, the strategic effectiveness of GES depends on an export firm's ability to deploy it in response to evolving foreign customer preferences and the growing demand for green products. In this context, exporters lacking export responsiveness may fail to achieve strategic effectiveness in their use of GES. Strategy literature suggests that firms need the right capabilities to deploy a given strategy (Teece 2014; Sirmon et al. 2011). When firms lack the needed capabilities, an emphasis on GES can lead to a strategic 'misfit,' a situation where strategy execution cannot be supported and sustained to achieve desired performance outcomes (Teece 2014). We propose that export responsiveness is a crucial capability necessary for orchestrating GES to achieve alignment with foreign market requirements.

Extant literature suggests that firms' ability to recognize and quickly respond to changing customer demands is critical for export success (Diamantopoulos et al. 2014; Morgan et al. 2012). Export responsiveness enables firms to identify and meet dynamic customer needs by introducing innovations such as environmentally friendly products, thereby maintaining their competitive edge (Cadogan 2012; Chung 2012). By proactively addressing shifts in customer preferences, export-responsive firms are more equipped to develop and implement innovative solutions (Sousa et al. 2010; Jayachandran et al. 2004). Hence, firms that emphasize GES are more likely to achieve external fit and, therefore, greater export performance if they also demonstrate greater responsiveness to market issues.

Global markets are still in transition toward environmental sustainability, with varying and sometimes divergent views, demands, and approaches (Nascimento et al. 2022; Manning et al. 2012). Customer expectations related to green initiatives continue to evolve in response to government policies, regulatory changes, competitors' green innovations and other stakeholder pressures. Importantly, the nature and scope of green requirements differ across foreign markets (Global Sustainability Study 2021; Nascimento et al. 2022). This variation implies that the content and implementation of GES must be tailored to suit specific foreign markets. Firms must be flexible and agile in designing and executing GES to align with specific foreign market requirements and preferences. Firms with strong export responsiveness can tailor and deploy GES effectively (Nemkova et al. 2015).

In summary, the preceding arguments suggest that emphasizing GES under conditions of high export responsiveness, though potentially costly, can enhance the strategic effectiveness of export firms. Conversely, emphasizing GES under low export responsiveness may improve efficiency but reduce strategic effectiveness. Since the ability to quickly meet foreign market requirements is essential for competitive exporting, we argue that high levels of export responsiveness strengthen the contribution of GES to export performance. Therefore, we posit that:

**Hypothesis 3.** *Export responsiveness moderates the link between GES and export performance, such that this relationship is*

*positive and stronger forfirms with higher export responsiveness than for those with lower export responsiveness.*

## 4 | Research Methodology

### 4.1 | Sample and Data

The research focused on manufacturers engaged in exports from Ghana, a developing country, to test our hypotheses. Exporting remains a major mode of internationalization for firms in Ghana. Over the years, the Ghanaian government has actively partnered with local and foreign institutions to promote industrialization and support the export of non-traditional products through its national export strategy. Ghanaian exporters operate in numerous foreign markets across Asia, Europe, North America and Africa (Essuman et al. 2023). Ghanaian exporters have been used as suitable samples in prior international business research (e.g., Sraha et al. 2017; Essuman et al. 2023), including studies focusing on sustainability issues (e.g., Frimpong et al. 2025).

We constructed a sample with the following characteristics. The sample comprises exporters that were entirely Ghanaian-owned and not subsidiaries or branches of other companies. They employed between five and 250 full-time staff members and provided contact information for executives knowledgeable about their export activities. Consistent with our measurement of GES and export performance, only exporters that had been in operation for at least 3 years were considered. Based on this information, we selected 500 export manufacturers registered with the Ghana Export and Promotion Authority (Essuman et al. 2023).

We designed and implemented a survey to collect data, as publicly available data on the study's concepts was not available (Frimpong et al. 2025). We followed the examples from prior research on Ghanaian exporters to obtain survey data (e.g., Essuman et al. 2023). Because the exporters were largely small and medium-sized firms, we obtained data from a single key respondent per firm (Kull et al. 2018). Respondents were deliberately selected based on their position and job role (i.e., top or senior managers such as CEOs and export managers), export experience (minimum of three years), and willingness to participate in the study (Silva et al. 2023; Essuman et al. 2023). Additionally, only respondents who were literate in English were considered, as the questionnaire was administered in English.

We trained a team of research assistants with extensive experience in conducting organizational-level surveys to collect the data. The research assistants approached the firms in person to administer the questionnaire (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Essuman et al. 2023). Upon arrival, they presented a cover letter explaining the academic purpose of the study, its practical implications and assurances of respondent anonymity. The research assistants also inquired about the availability of key respondents. Executives who consented to participate were given a questionnaire to complete within 10 working days.

The research assistants successfully contacted 421 firms of interest that did not participate in the pilot study; the remaining firms were unreachable due to difficulties in locating them. Of the firms reached, 47 declined to participate. Over a two-month data collection period, spanning from October to November 2024, we received 273 completed questionnaires. Thirteen were excluded due to missing values or unconfirmed respondent positions. The final sample consisted of 260 valid responses, resulting in an effective response rate of 69.5%. This sample size is comparable to those used in related studies (e.g., Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023) and was adequate for both confirmatory factor analysis (Bagozzi and Yi 2012) and regression analysis (Hair et al. 2019). Table 2 presents the profile information of the sample and respondents.

### 4.2 | Measurement

We relied on prior empirical studies to identify items to measure our constructs. The items were revised based on feedback from four other researchers who specialize in green strategies and export literature. Additionally, we piloted the questionnaire with 10 export manufacturers who were not part of the main survey. The responses from the pilot study indicated no major concerns regarding the items, the rating scales, or the overall design of the questionnaire. Table 3 presents the measurement items, along with their reliability and validity statistics. The following sections discuss the items.

#### 4.2.1 | Substantive Variables

*Export performance* was operationalized with four items that reflect the degree to which firms achieved economic objectives related to sales and profits in their foreign markets in the last 2 years. The items were adopted from Nemkova et al. (2015). The respondents used a seven-point scale ranging from 1 = '*much worse*' to 7 = '*much better*' to rate their firms' export performance compared to their key competitors in the areas of export sales volume, reaching financial goals, export profit growth and absolute export sales revenue.

*GES* captures the extent to which export firms' product-market decisions and activities are influenced by and respond to green issues (Banerjee et al. 2003). We adapted four items from the scales that Banerjee et al. (2003) used to measure corporate environmental and marketing strategies. Our measurement ensured the items reflected the export context. Specifically, we asked export manufacturers to consider their export markets over the last 3 years and rate the extent to which their export decisions and activities have been influenced by and responded to environmental issues. A sample item is "our firm's product-market decisions in our export operations are always influenced by environmental concerns". All the items were anchored on a seven-point scale: 1 = '*strongly disagree*' to 7 = '*strongly agree*'.

*Foreign customer green concern* was measured in terms of the extent to which foreign customers prioritize environmental protection and expect firms to do the same. We adapted three items from an existing scale for the concept of foreign environmental public concern, which comprises customer-focused items

**TABLE 2** | Sample and respondent profile.

| Variable/category | | Frequency | Percent |
|---|---|---|---|
| Respondent education level | O′ level/SSCE/WASSCE | 8 | 3.1 |
| | HND/Diploma | 47 | 18.1 |
| | Degree | 56 | 21.5 |
| | Masters | 148 | 56.9 |
| | PhD | 1 | 0.4 |
| Respondent managerial position | CEO/Owner | 2 | 0.8 |
| | General manager | 91 | 35.0 |
| | Production manager | 65 | 25.0 |
| | Export manager | 45 | 17.3 |
| | Marketing/Sales Manager | 57 | 21.9 |
| Firm size | 5 to 10 employees | 28 | 10.8 |
| | 10–49 employees | 21 | 8.1 |
| | 50–250 employees | 211 | 81.2 |
| Firm age | 3–5 years | 38 | 14.6 |
| | 6–10 years | 122 | 46.9 |
| | 11 or more years | 100 | 38.5 |
| Product type | Consumer | 68 | 26.2 |
| | Industrial | 192 | 73.8 |
| Firms' export experience | 3–5 years | 55 | 21.2 |
| | 6–10 years | 141 | 54.2 |
| | 11 or more years | 64 | 24.6 |
| Number of export destinations | 1–3 countries | 15 | 5.8 |
| | 4–6 countries | 131 | 50.4 |
| | 7 or more countries | 114 | 43.8 |
| Export destination | Developed markets only | 45 | 17.3 |
| | Emerging market only | 164 | 63.1 |
| | Both markets | 51 | 19.6 |

(Banerjee et al. 2003; Leonidou et al. 2015). A sample item is "our customers expect our firm to be environmentally friendly". The items were anchored on a seven-point scale: 1 = '*strongly disagree*' to 7 = '*strongly agree*'.

*Export responsiveness* was operationalized as the ability of a firm to swiftly adapt to the evolving demands of customers in export markets (Sousa et al. 2024). We adopted five items from Nemkova et al. (2015) to measure export responsiveness. A sample item is "We are able to adapt to market changes in our export markets quickly". The items were anchored on a seven-point scale: 1 = '*strongly disagree*' to 7 = '*strongly agree*'.

### 4.2.2 | Control Variables

The literature suggests that firm-specific characteristics and external environmental factors can influence green strategies and export performance. Accordingly, we included six theoretically relevant factors in our hypothesis testing to mitigate potential omitted variable concerns: export commitment, export experience, firm size, export market destination, export diversification and product type. The first three are firm-specific resource factors that can determine a firm's effectiveness in implementing GES to drive export performance. The last three are product-market-related factors that may also shape GES and account for differences in export performance.

*Export commitment* refers to the degree to which organizational and managerial resources are allocated to planning and carrying out export activities (Filipe Lages and Montgomery 2004). The extant literature highlights the importance of export commitment in driving export strategy adaptation (Filipe Lages and Montgomery 2004) and export performance (Sraha et al. 2017). Four items were adapted from Filipe Lages and Montgomery (2004) to measure export commitment. A sample item is: "Our firm commits more financial resources to exporting activities than to the domestic market." Responses were recorded on a seven-point scale, ranging from 1 = '*strongly disagree*' to 7 = '*strongly agree*'.

*Export experience* is defined as the number of years a firm has been exporting. Export experience is an important source of experiential knowledge, which is critical for understanding and managing foreign market issues. Firms with more than 10 years of export experience were coded as '1', while those with 10 years or less were coded as '0'.

*Firm size*. Small firms may lack critical resources (e.g., managerial and financial) to navigate operations or implement export strategies. We assigned '0' to small export firms (18.8%) and '1' to medium and large firms.

*Export diversification* refers to the number of different foreign export markets a firm operates in. While greater foreign diversification enhances exporters' capacity to buffer their operations and generate foreign knowledge and revenue, it can also increase operational complexity and expose firms to various risks, requiring greater attention to foreign market issues (Essuman et al. 2023). Firms with fewer than seven export destinations were assigned a value of '0', while those with seven or more were assigned a value of '1'.

*Export destination* was operationalized based on whether a firm's primary export markets were in emerging/developing countries (coded '1') or developed/advanced countries (coded

**TABLE 3** | Confirmatory factor analysis.

| Construct/Items/Composite reliability (CR), Average variance extracted (AVE) | Mean | SD | Standardized loadings (SL) | Standard error of SL |
|---|---|---|---|---|
| *Green export strategy* (CR = 0.877, AVE = 0.642) | | | | |
| Our firm has incorporated environmental issues in its strategic export planning process | 4.71 | 1.21 | 0.792 | 0.028 |
| Our export strategy for our products has been considerably influenced by environmental concerns | 4.79 | 1.17 | 0.816 | 0.026 |
| Our firm's product-market decisions in our export operations are always influenced by environmental concerns | 4.64 | 1.21 | 0.786 | 0.029 |
| Our firm is committed to manufacturing products that minimize environmental impact on our export operations | 4.95 | 1.12 | 0.814 | 0.026 |
| *Foreign customer green concern* (CR = 0.811, AVE = 0.589) | | | | |
| Our customers feel that environmental protection is a critically important issue facing the world today | 5.30 | 1.05 | 0.757 | 0.036 |
| Our customers are increasingly demanding environmentally friendly products | 4.95 | 1.11 | 0.802 | 0.034 |
| Our customers expect our firm to be environmentally friendly | 5.19 | 1.07 | 0.740 | 0.037 |
| *Export responsiveness* (CR = 0.917, AVE = 0.688) | | | | |
| We are able to adapt to market changes in our export markets quickly | 4.55 | 1.23 | 0.840 | 0.022 |
| We are very quick to adapt to shifts in our export markets (e.g., regulations, technology, competition) | 4.22 | 1.26 | 0.817 | 0.024 |
| Our whole export function is very adaptable to change | 4.47 | 1.30 | 0.831 | 0.022 |
| We are very good at adapting to change in our export markets | 4.42 | 1.23 | 0.794 | 0.026 |
| When we come up with a great solution to an export problem, we can implement it very quickly | 4.29 | 1.26 | 0.863 | 0.019 |
| *Export economic performance* (CR = 0.900, AVE = 0.693) | | | | |
| Export sales volume (in unit terms) | 4.44 | 1.26 | 0.795 | 0.027 |
| Reaching export financial goals | 4.42 | 1.47 | 0.843 | 0.023 |
| Export profit growth | 4.35 | 1.42 | 0.865 | 0.021 |
| Absolute export sales revenue | 4.45 | 1.34 | 0.815 | 0.025 |
| *Export resource commitment* (CR = 0.892, AVE = 0.686) | | | | |
| In our firm, there is substantial planning for our exporting activities | 4.98 | 1.22 | 0.794 | 0.027 |
| Our firm commits a significant number of human resources to our exporting activities | 4.60 | 1.35 | 0.814 | 0.025 |
| Our firm has a significant degree of management commitment to exporting activities | 4.58 | 1.53 | 0.862 | 0.021 |
| Our firm commits more financial resources to exporting activities than to the domestic market | 4.63 | 1.28 | 0.823 | 0.024 |

'0'). In addition to differences in threats and opportunities, environmental pressures can vary between these market types.

*Product type* was operationalized based on whether firms primarily exported consumer products (coded '1') or industrial products (coded '0'). We expect the regulatory and market-related green requirements for these product categories to vary.

## 5 | Analysis and Results

### 5.1 | Reliability and Validity Assessment

We used covariance-based confirmatory factor analysis (CFA) to examine the reliability and validity of the multi-item scales (Hair et al. 2019). The analysis was conducted using the Mplus 7.40 module within JASP version 0.19.3, with maximum

likelihood selected as the estimation method (Rogers 2024). JASP was preferred due to its capability to automatically generate additional statistics (e.g., composite reliability, average variance extracted, and heterotrait–monotrait [HTMT] ratio) for assessing the reliability and validity of the items. We replicated the analysis in Mplus 7.40 independently, obtaining the same model fit indices and factor loadings. Specifically, we estimated a multi-factor CFA model that included all items. The model fits the data well, given Chi-square ($\chi^2$) = 240.977, degree of freedom (DF) = 160, normed $\chi^2$ = 1.506, RMSEA = 0.044, Tucker–Lewis index (TLI) = 0.971, comparative fit index (CFI) = 0.976 and standardized root mean square residual (SRMR) = 0.039.

Table 3 presents the factor loadings, which range from 0.740 to 0.865, all of which are significant at the 1% level. Table 3 also shows that the composite reliability values for the set of items range from 0.811 to 0.917, while the average variance extracted (AVE) values range from 0.589 to 0.693. These results demonstrate the internal consistency and convergent validity of the items (Hair et al. 2019).

To assess discriminant validity, we squared the latent correlations (ranging from 0.152 to 0.652) to obtain the latent shared variances (ranging from 0.023 to 0.425) and compared these with the AVE values (0.589 to 0.693) for the items (Voorhees et al. 2016; Hair et al. 2019). The AVE values were substantially greater than the corresponding latent shared variances. Additionally, we computed the HTMT ratios for the items, which ranged from 0.141 to 0.649, well below the recommended cutoff of 0.85 (Voorhees et al. 2016). Collectively, these results confirm the discriminant validity of the study's items (Voorhees et al. 2016).

### 5.2 | Common Method Bias Control and Assessment

Common method bias can result from many sources in a single-time survey completed by a single respondent (Podsakoff et al. 2024). Accordingly, we used a combination of procedural remedies to improve measurement reliability (Sections 4 and 5.1) and to appropriately design and administer the questionnaire (Podsakoff et al. 2024). For example, the survey's cover letter assured respondents that their identity would be protected throughout the survey and that their responses would be anonymized and aggregated with other responses. These measures help reduce common method bias that often results from social desirability and response consistency. To ensure that respondents take responsibility for providing accurate responses, we further informed them that the survey, although for academic purposes, seeks to generate practical insights for exporters in the country, and that they should indicate if they want to receive the study's managerial brief. Furthermore, we varied the scale anchor labels for the dependent variable and the independent and moderating variables and ensured that the items for these variables were placed far apart in the questionnaire, allowing us to control for response consistency and artefactual correlations resulting from item proximity. Moreover, the data were obtained from knowledgeable and competent respondents.

However, because the same respondent answered all the survey items and may have provided responses based on their subjective view of the world, the data may suffer from a common-rater effect (Podsakoff et al. 2024). To investigate this issue, the questionnaire included a three-item negative affectivity scale (Menguc et al. 2014), using it as a directly measured latent variable (DMLV) in CFA to assess the extent to which CMB is present in the data (Podsakoff et al. 2024). The items were as follows: (1) minor setbacks tend to irritate me too much, (2) often, I get irritated at little annoyances and (3) there are days when I am 'on-edge' all of the time (Menguc et al. 2014). The items, rated on a seven-point scale ranging from 'strongly disagree (=1)' to 'strongly agree (=7)', had good internal consistency (Cronbach's alpha = 0.817).

This DMLV has similar scale properties as the substantive ones (e.g., rated on a seven-point agreement–disagreement scale), but we do not expect it to be theoretically correlated with the items for the substantive latent variables. To assess the effect of DMLV, we examined whether including DMLV in our original CFA model (Model 1, see Section 5.1) would change its latent correlations (Podsakoff et al. 2024). We estimated this extended CFA model (Model 2) by specifying the DMLV items to load on DMLV and all the items for the substantive latent variables, and by specifying the correlations between DMLV and the substantive latent variables to be zero (Podsakoff et al. 2024). As with Model 1, Model 2 fits the data well: $\chi^2$ = 292.009, DF = 200, normed $\chi^2$ = 1.460, RMSEA = 0.042, CFI = 0.975, TLI = 0.968, SRMR = 0.036.

However, the results indicate that including DMLV in the CFA model does not change the magnitude, direction, or significance of the correlations between the substantive latent variables. Model 1's latent correlations (0.558, 0.650, 0.512, 0.540, 0.517, 0.152, 0.190, 0.472, 0.652, 0.604) are almost perfectly associated with Model 2's latent correlations (0.558, 0.656, 0.518, 0.535, 0.517, 0.153, 0.188, 0.471, 0.657, 0.612), with a given correlation coefficient of 0.9998. Considering these results together with the procedural remedies we implemented, CMB may not confound the study's findings (Podsakoff et al. 2024).

### 5.3 | Hypothesis Testing

We performed a moderated regression analysis in SPSS 29 to test the hypotheses. The variables we included in the analysis, together with their descriptive statistics and correlations, are shown in Table 4. We mean-centred the independent variable (GES) and the moderating variables (foreign customer green concern [FCGC] and export responsiveness [EXRES]) before creating the interaction terms (GES × FCGC and GES × XRES) to ensure an accurate interpretation of the results for Hypothesis 1 (Hayes 2018). We estimated three hierarchical models (Models 1 to 3). Model 1 includes only the control variables ($R^2$ = 22.4%), Model 2 adds the three substantive variables ($\Delta R^2$ = 14.9%) and Model 3 introduces the two interaction terms ($\Delta R^2$ = 2.9%). We used the results from Model 3 to evaluate the hypotheses, as it includes all variables and shows a significant improvement in the variance explained in export performance ($\Delta$F = 6.086, $p < 0.001$). Finally, we used PROCESS 3.5 in SPSS 29 to perform simple slope and Johnson–Neyman analyses to explore how the main effect of GES changes at specific levels of each

**TABLE 4** | Correlations and descriptive statistics (based on composite scales).

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Green export strategy | — | | | | | | | | | | |
| 2. Foreign customer green concern | 0.465** | — | | | | | | | | | |
| 3. Export responsiveness | 0.483** | 0.164** | — | | | | | | | | |
| 4. Export performance | 0.454** | 0.128* | 0.551** | — | | | | | | | |
| 5. Export resource commitment | 0.576** | 0.446** | 0.587** | 0.426** | — | | | | | | |
| 6. Consumer products | 0.266** | 0.193** | 0.217** | 0.269** | 0.267** | — | | | | | |
| 7. Export experience | −0.065 | −0.068 | 0.063 | −0.009 | −0.029 | 0.005 | — | | | | |
| 8. Emerging/developing export markets | −0.085 | −0.007 | −0.050 | −0.058 | −0.041 | 0.074 | −0.044 | — | | | |
| 9. Foreign market diversification | −0.065 | 0.098 | −0.092 | −0.043 | 0.038 | 0.144* | −0.037 | 0.114 | — | | |
| 10. Medium and large exporters | 0.280** | 0.073 | 0.106 | 0.107 | 0.112 | −0.071 | −0.044 | 0.120 | 0.069 | — | |
| 11. Negative affectivity | 0.088 | 0.025 | 0.094 | −0.021 | −0.002 | 0.081 | −0.102 | −0.026 | 0.038 | −0.046 | — |
| Mean | 4.774 | 5.145 | 4.39 | 4.413 | 4.695 | 0.262 | 0.246 | 0.631 | 0.438 | 0.812 | 2.150 |
| Standard deviation | 1.008 | 0.915 | 1.087 | 1.203 | 1.172 | 0.44 | 0.432 | 0.484 | 0.497 | 0.392 | 0.989 |

*$p < 0.05$ (2-tailed).
**$p < 0.01$ (2-tailed).

moderating variable (Hayes 2018). Table 5 presents the moderated regression results, and Table 6 presents the results from the Johnson–Neyman analysis. The results for the slope analyses are displayed in Figures 1 and 2.

The results indicate that GES positively affects export performance ($\beta = 0.292, p = 0.001$), supporting Hypothesis 1, which posits that GES has a positive relationship with export performance. The findings also show that GES × FCGC positively affects export performance ($\beta = 0.150$, $p = 0.003$), while GES × EXRES negatively affects export performance ($\beta = -0.122$, $p = 0.026$). These results support Hypothesis 2 but reject Hypothesis 3, which state that FCGC and XRES strengthen the positive link between GES and export performance.

Figures 1 and 2 visualize the marginal effect of GES on export performance at plus (high) and minus (low) one standard deviation from the mean values of each moderator. Figure 1 shows that GES has a stronger positive effect on export performance at a high level of FCGC ($\beta = 0.43$, $p < 0.01$) than at a low level of FCGC ($\beta = 0.16$, $p = 0.09$). In contrast, Figure 2 shows that GES has a stronger positive effect on export performance at a low level of export responsiveness ($\beta = 0.42$, $p < 0.01$) than at a high level of XRES ($\beta = 0.16$, $p = 0.14$).

The Johnson–Neyman results in Table 6 provide further insights, revealing that the contribution of GES to export performance becomes more amplified as FCGC takes on higher values or XRES takes on lower values. However, when FCGC is lowest, GES tends to have a negative, though insignificant, effect on export performance. Similarly, when XRES is highest, the effect of GES is weakest but insignificant.

### 5.4 | Robustness Check

The literature on contingency analysis suggests that the multiplicative term approach used to statistically test Hypothesis 2

**TABLE 5** | Moderated regression results (dependent variable: export performance).

| | Model 1 (controls) | | | Model 2 (main effects) | | | Model 3 (moderation effects) | | |
|---|---|---|---|---|---|---|---|---|---|
| **Predictors** | ***β*** | **SE** | ***p*-Value** | ***β*** | **SE** | ***p*-Value** | ***β*** | **SE** | ***p*-Value** |
| Consumer products | 0.533 | 0.160 | 0.001 | 0.348 | 0.149 | 0.020 | 0.314 | 0.146 | 0.032 |
| Export experience | −0.004 | 0.155 | 0.981 | −0.068 | 0.141 | 0.630 | −0.114 | 0.139 | 0.413 |
| Emerging/developing export markets | −0.149 | 0.140 | 0.291 | −0.072 | 0.128 | 0.572 | −0.059 | 0.126 | 0.641 |
| Foreign market diversification | −0.204 | 0.136 | 0.135 | −0.005 | 0.127 | 0.967 | −0.003 | 0.124 | 0.983 |
| Medium and large exporters | 0.285 | 0.174 | 0.103 | 0.036 | 0.166 | 0.829 | 0.003 | 0.166 | 0.985 |
| Export resource commitment | 0.373 | 0.060 | < 0.001 | 0.078 | 0.074 | 0.289 | 0.142 | 0.075 | 0.059 |
| Green export strategy (GES) | | | | 0.276 | 0.085 | 0.001 | 0.292 | 0.084 | 0.001 |
| Foreign customer green concern (FCGC) | | | | −0.136 | 0.079 | 0.088 | −0.080 | 0.080 | 0.318 |
| Export responsiveness (XRES) | | | | 0.423 | 0.073 | < 0.001 | 0.345 | 0.075 | < 0.001 |
| GES × FCGC | | | | | | | 0.150 | 0.050 | 0.003 |
| GES × XRES | | | | | | | −0.122 | 0.054 | 0.026 |
| Constant | 2.475 | 0.316 | < 0.001 | 3.990 | 0.385 | < 0.001 | 3.730 | 0.387 | < 0.001 |
| $R^2$ | | 22.4% | | | 37.3% | | | 40.2% | |
| $\Delta R^2$ | | | | | 14.9% | | | 2.9% | |
| F of $R^2$ | | 12.190 | | | 16.518 | | | 15.171 | |
| F of $\Delta R^2$ | | | | | 19.752 | | | 6.086 | |
| *p*-Value of F | | < 0.001 | | | < 0.001 | | | < 0.001 | |
| *p*-Value of ΔF | | < 0.001 | | | < 0.001 | | | 0.003 | |
| Highest variance inflation factor | | 1.122 | | | 2.068 | | | 2.205 | |

*Note:* β = unstandardized coefficient; SE = standard error; *p*-value (2-tailed).

and Hypothesis 3 may not be suitable for analysing the concept of 'fit' within the framework of strategic alignment (Donaldson 2006). Instead, the fit-as-matching method is advocated as a better alternative and is therefore used to assess the robustness of the multiplicative term approach applied in this study (Venkatraman 1989; Donaldson 2006).

The fit-as-matching method assumes multiple instances along a continuum where 'fit' can be achieved and defines 'fit' as a situation in which a predictor variable and a moderating variable, if measured on the same scale and calibration, assume the same value. In this study, both the predictors and the moderators were measured using a seven-point scale. Under this approach, fit occurs when a firm scores 1 on GES and 1 on any of the moderating variables, or when a firm scores 2 on GES and also 2 on any of the moderating variables, and so forth (Donaldson 2006).

Following this method, we computed two variables to represent fit-as-matching: one for testing Hypothesis 2 (i.e., GES and foreign customer green concern) and another for testing Hypothesis 3 (i.e., GES and export responsiveness). The following formulas were used to create new variables to capture the degree of misfit between GES and each moderating variable (Wagner et al. 2012; Donaldson 2006):

Misfit between GES and foreign customer green concern (FCGC) for firm *i*:

$$GESFCGC_i = | GES_i - FCGC_i | \quad (1)$$

Misfit between GES and export responsiveness (XRES) for firm *i*:

$$GESXRES_i = | GES_i - XRES_i | \quad (2)$$

We then used GESFCGC and GESXRES as predictors in a regression analysis to test Hypothesis 2 and Hypothesis 3, respectively. Since GESFCGC and GESXRES represent mis-fit situations, a fit, and consequently higher export performance, is indicated by a negative regression coefficient for these variables. Conversely, a positive regression coefficient indicates misfit, associated with a lower export performance (Wagner et al. 2012; Donaldson 2006).

**TABLE 6** | Slope analysis of moderating effects (Johnson–Neyman technique).

| Foreign customer green concern | β | SE | *p*-Value | Levels of export responsiveness | β | SE | *p*-Value |
|---|---|---|---|---|---|---|---|
| 1.67 | −0.228 | 0.182 | 0.211 | 1.20 | 0.680 | 0.185 | <0.001 |
| 1.93 | −0.188 | 0.171 | 0.270 | 1.48 | 0.646 | 0.172 | <0.001 |
| 2.20 | −0.149 | 0.159 | 0.352 | 1.76 | 0.612 | 0.159 | <0.001 |
| 2.47 | −0.109 | 0.148 | 0.464 | 2.04 | 0.578 | 0.146 | <0.001 |
| 2.73 | −0.069 | 0.137 | 0.617 | 2.32 | 0.544 | 0.134 | <0.001 |
| 3.00 | −0.029 | 0.127 | 0.821 | 2.60 | 0.510 | 0.123 | <0.001 |
| 3.27 | 0.011 | 0.117 | 0.925 | 2.88 | 0.476 | 0.112 | <0.001 |
| 3.53 | 0.051 | 0.109 | 0.639 | 3.16 | 0.442 | 0.103 | <0.001 |
| 3.80 | 0.091 | 0.101 | 0.367 | 3.44 | 0.408 | 0.095 | <0.001 |
| 4.07 | 0.131 | 0.094 | 0.165 | 3.72 | 0.374 | 0.089 | <0.001 |
| 4.33 | 0.171 | 0.089 | 0.055 | 4.00 | 0.340 | 0.085 | <0.001 |
| 4.36 | 0.174 | 0.088 | 0.050 | 4.28 | 0.306 | 0.084 | <0.001 |
| 4.60 | 0.211 | 0.085 | 0.014 | 4.56 | 0.272 | 0.086 | 0.002 |
| 4.87 | 0.251 | 0.084 | 0.003 | 4.84 | 0.238 | 0.090 | 0.009 |
| 5.13 | 0.290 | 0.084 | 0.001 | 5.12 | 0.203 | 0.097 | 0.036 |
| 5.40 | 0.330 | 0.087 | <0.001 | 5.20 | 0.194 | 0.099 | 0.050 |
| 5.67 | 0.370 | 0.092 | <0.001 | 5.40 | 0.169 | 0.105 | 0.107 |
| 5.93 | 0.410 | 0.098 | <0.001 | 5.68 | 0.135 | 0.115 | 0.238 |
| 6.20 | 0.450 | 0.105 | <0.001 | 5.96 | 0.101 | 0.125 | 0.420 |
| 6.47 | 0.490 | 0.114 | <0.001 | 6.24 | 0.067 | 0.137 | 0.624 |
| 6.73 | 0.530 | 0.123 | <0.001 | 6.52 | 0.033 | 0.149 | 0.824 |
| 7.00 | 0.570 | 0.133 | <0.001 | 6.80 | −0.001 | 0.162 | 0.996 |

*Note:* Dependent variable = export performance; independent variable = GES; β = unstandardized coefficient; SE = standard error; *p*-value (2-tailed).

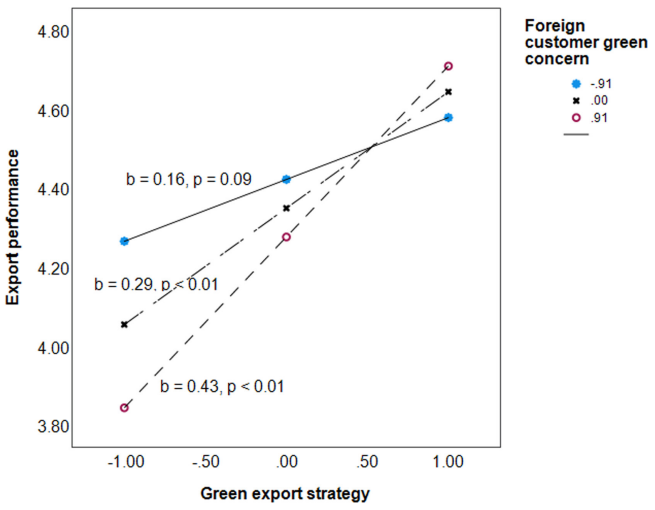


**FIGURE 1** | Moderating effect of foreign customer green concern. *Note:* Mean-centered values of green export strategy and foreign customer green concern are shown. Minus 1 standard deviation, mean, and plus 1 standard deviation values of foreign customer green concern are reported.

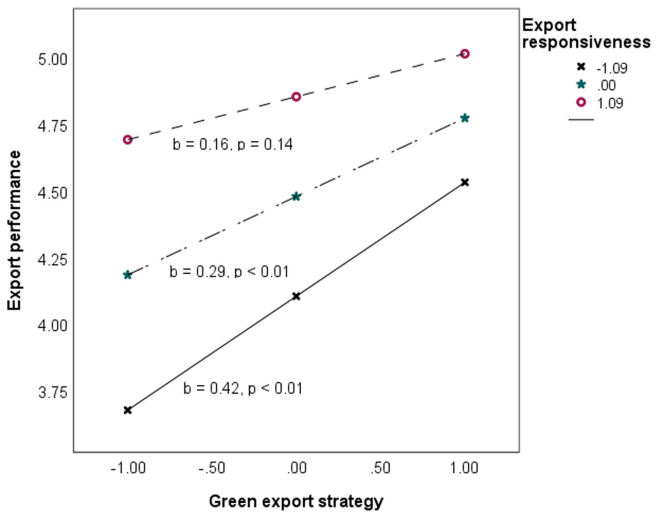


**FIGURE 2** | Moderating effect of export responsiveness. *Note:* Mean-centered values of green export strategy and export responsiveness are shown. Minus 1 standard deviation, mean, and plus 1 standard deviation values of export responsiveness are reported.

The results presented in Table 7 show that GESFCGC has a significant negative effect on export performance ($\beta = -0.281$, $p = 0.011$); whereas GESXRES has a significant positive effect on export performance ($\beta = 0.239$, $p = 0.024$). These findings confirm the conclusions drawn from the multiplicative term approach (Table 5).

## 6 | Discussion

This research addresses the question of how and when GES affects the export performance of exporters from a developing country. We applied the strategic alignment perspective to argue that GES drives export performance, particularly in foreign markets where customer green concerns are high or in firms that are more responsive to the requirements of such markets. The empirical data from a sample of exporters in Ghana provided mixed insights regarding these arguments, which we discuss in this section. We also discuss the implications of the findings for research and practice, as well as the study's limitations and suggestions for future research.

**TABLE 7** | Robustness test (regression results for fit-as-matching analysis).

| | Dependent variable: Export performance | | |
|---|---|---|---|
| **Predictors** | ***β*** | **SE** | ***p*-Value** |
| Consumer products | 0.322 | 0.149 | 0.031 |
| Export experience | −0.095 | 0.139 | 0.497 |
| Emerging/developing export markets | −0.086 | 0.126 | 0.494 |
| Foreign market diversification | 0.014 | 0.124 | 0.910 |
| Medium and large exporters | 0.018 | 0.165 | 0.911 |
| Export resource commitment | 0.141 | 0.075 | 0.062 |
| Green export strategy (GES) | 0.113 | 0.096 | 0.241 |
| Foreign customer green concern (FCGC) | −0.033 | 0.087 | 0.706 |
| Export responsiveness (XRES) | 0.484 | 0.077 | 0.000 |
| GESFCGC[a] | −0.281 | 0.110 | 0.011 |
| GESXRES[b] | 0.239 | 0.105 | 0.024 |
| Constant | 1.245 | 0.480 | 0.010 |
| $R^2$ | | 40.1% | |
| $\Delta R^2$ | | | |
| F of $R^2$ | | 15.099 | |
| F of $\Delta R^2$ | | | |
| *p*-Value of F | | < 0.001 | |
| *p*-Value of ΔF | | < 0.001 | |
| Highest variance inflation factor | | 2.699 | |

*Note:* β = unstandardized coefficient; SE = standard error; *p*-value (2-tailed).
[a]Misfit between GES and foreign customer green concern.
[b]Misfit between GES and export responsiveness.

### 6.1 | Discussion of Key Findings

The study reveals two major findings. The first concerns the main effect of GES on export performance; the second relates to the conditions under which GES affects export performance. We discuss these findings below.

First, the study's data shows that export performance is generally higher for firms that emphasize GES. This finding aligns with some evidence from studies examining the effect of green export strategies on international or export performance outcomes (Singh et al. 2024; Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023). Other green concepts have been examined with similar arguments that being environmentally friendly in practices, processes, and products is essential for international or export success. However, the results of these studies contradict the findings of this study. For instance, concepts such as environmental management (Li and Li 2024), energy conservation and emission reduction (Xu et al. 2018) and green supply chain management (Al-Ghwayeen and Abdallah 2018) have been shown to have no significant impact on international performance outcomes after controlling for relevant intervening factors.

The study's findings support our arguments grounded in the strategic alignment perspective that GES can enhance the performance of exporters from developing countries. Since these firms must align their operations and products with emerging environmental requirements in foreign markets, GES becomes a critical factor in their success, all else being equal (Frimpong et al. 2025; Chang 2024). As theorized from the strategic alignment perspective, GES serves as a mechanism through which these firms achieve external fit in foreign markets and, consequently, improve export performance (Flynn et al. 2010). This external fit is argued to increase as developing-country exporters emphasize GES, offering them greater intangible resources (e.g., legitimacy and reputational capital) and opportunities (e.g., environmentally driven consumer demand) to compete more effectively, either against local firms in host countries or firms from more developed economies that may face fewer reputational and legitimacy challenges.

Second, the findings reveal two contextual factors (foreign customer green concern and export responsiveness) that moderate the link between GES and export performance. These findings broadly corroborate evidence from Bıçakcıoğlu et al. (2020), which suggests that green business strategy affects the export financial performance of exporters from an emerging country differently, depending on their levels of environmental orientation, green product differentiation and cost leadership. The study's findings further reinforce evidence from other streams of research suggesting that the performance outcomes of green practices, such as environmental product design (Chavez et al. 2023) and green supply chain management (Cousins et al. 2019), are context-dependent.

As Figure 1 shows, this study finds that GES has a stronger positive effect on export performance for exporters serving foreign markets where customers prioritize green issues, compared to those in markets where such concerns are low. Specifically, both the slope and Johnson–Neyman analyses indicate that the marginal export performance benefit of increasing GES rises with higher levels of foreign customer green concern. However, when foreign customer concern is well below the average level faced by exporters, increasing GES yields no marginal improvement in export performance. Consistent with the strategic alignment perspective advanced in this study, these results reinforce the argument that while GES can help exporters achieve external fit in foreign markets, the extent of this fit—and the associated export performance benefits—intensifies when foreign markets are more concerned about green issues. On the other hand, export firms risk strategic misalignment if they emphasize GES in markets with low foreign customer green concern. As evidenced by the study's results, such misalignment reduces export performance.

Contrary to the study's theoretical expectations, the results indicate that GES contributes more to export performance in firms with lower export responsiveness; when export responsiveness is high, GES is less beneficial. This finding appears to mirror the evidence from Bıçakcıoğlu et al.'s (2020) study of Turkish exporters: combining green business strategy and green product differentiation, while it involves costly adaptations, lowers export financial performance. The plausibility of the evidence from this study lies in the observation that both GES (Xu et al. 2018) and export responsiveness (Wagner et al. 2012) involve trade-offs between strategic effectiveness and strategic efficiency. These trade-offs complicate the notion of strategic alignment when analysing the interaction between GES and export responsiveness.

On one hand, both GES and export responsiveness are market-centred, making them effective for driving differentiation advantages. For instance, GES can help firms gain reputational benefits while also differentiating their products in the market (Leonidou et al. 2015). Similarly, export responsiveness enables firms to quickly meet shifts in market demands, allowing them to stand out in terms of service levels, such as delivery speed and customization (Nemkova et al. 2015). Accordingly, it is unsurprising that the study's findings indicate that either GES or export responsiveness can improve export performance.

On the other hand, literature suggests that simultaneously pursuing both GES and export responsiveness can be expensive and result in inefficiency. Besides the investment costs, implementing GES may result in inefficiencies (Bıçakcıoğlu et al. 2020) as it requires changes and interruptions to existing manufacturing systems and established supply chain routines to meet emerging environmental requirements (Appiah and Essuman 2024). Research has shown that green-related strategies do not provide cost leadership in export markets (Leonidou et al. 2015). Similarly, emphasis on export responsiveness can diminish the efficiency benefits of product and process standardization. Also, being agile and flexible in addressing market issues incurs additional operational expenses (Wagner et al. 2012). Therefore, emphasizing GES in high export responsiveness conditions can exacerbate inefficiencies, reducing firms' ability to compete on cost or price. Thus, while high levels of both GES and export responsiveness offer greater strategic effectiveness (e.g., differentiation and reputational advantages), they also come at higher costs for consumers, which can diminish the overall competitiveness of export firms.

Taken together, the positive and significant main effects of both GES and export responsiveness suggest that these factors function as substitutes rather than complements in determining export performance within the study's context. The negative regression coefficient for their interaction indicates that the marginal performance benefit of GES decreases as export responsiveness increases. As shown in Figure 2, higher export responsiveness is associated with higher export performance at any level of GES (low, medium or high), indicating that export responsiveness contributes positively to export performance independent of GES. Particularly, GES's marginal contribution to export performance is stronger among firms whose export responsiveness is low.

To conclude, the study's findings suggest that the exporters in our study can use GES to achieve strategic alignment in foreign markets when they (1) increase GES in contexts with above-average levels of foreign customer green concern or (2) increase GES at levels below the mean export responsiveness. Either scenario enhances the marginal export performance benefits of investing in GES.

### 6.2 | Research Implications and Contributions

The study's application of the strategic alignment perspective advances prior theoretical analyses of why and when green strategies (or practices) benefit international firms, including exporters. Previous research has emphasized the importance of green strategies for successful internationalization, often drawing on mainstream theories such as the resource-based view (Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023; Singh et al. 2024), the natural resource-based view (Frimpong et al. 2025) and stakeholder theory (Li and Li 2024; Xu et al. 2018). Resource-based theories conceptualize green strategies as resources that generate competitive advantage and superior performance (Bıçakcıoğlu et al. 2020; Frimpong et al. 2025), while stakeholder theory views these strategies as stakeholder-driven responses aimed at gaining support and access to resources necessary to compete (Li and Li 2024; Xu et al. 2018). Extending these mainstream theoretical perspectives, we applied the strategic alignment perspective to frame green strategies, such as GES, as mechanisms through which firms can achieve external fit. We argued that the capacity of GES to generate external fit can enhance firms' competitiveness in foreign markets (Walter et al. 2013; Flynn et al. 2010).

Prior green studies in the international business context and other domains highlight the theoretical value of analysing the performance implications of green strategies and practices from a contingency perspective. However, these analyses are mostly limited to identifying the boundary conditions of a given green strategy or practice (e.g., Bıçakcıoğlu et al. 2020; Chavez et al. 2023; Cousins et al. 2019). As presented in this study, the strategic alignment perspective, which builds on contingency theory, permits similar analyses, particularly when the predictor

variable constitutes a strategy (Sabherwal et al. 2019; Walter et al. 2013). Specifically, we used strategic alignment to account for relevant internal and external conditions (i.e., foreign customer green concern and export responsiveness) under which GES either enhances or reduces export performance. However, the paper's arguments also suggest that green strategies can themselves be theorized as variables that enable firms to align their operations and products with the requirements of foreign markets, thereby increasing their chances of success (Flynn et al. 2010). In this regard, the paper demonstrates the relevance of the strategic alignment perspective not only for explaining the performance outcomes of green strategies but also for identifying the boundary conditions that shape those outcomes.

Despite its utility, the study's findings regarding the moderating effect of export responsiveness highlight a key challenge in applying strategic alignment (or contingency) theory: specifying, a priori, the conditions under which a given strategy results in strategic alignment or misalignment (Donaldson 2006). Contrary to our theoretical expectations, the findings suggest that developing-country exporters can achieve enhanced export performance by emphasizing GES even when they are less export responsive. In treating export responsiveness as a contingency factor, the study's conceptualization of 'fit' leaned more toward strategic effectiveness, placing less emphasis on strategic efficiency. In terms of strategic effectiveness, we argued that a greater degree of export responsiveness enables firms to quickly and flexibly design and implement GES in alignment with foreign market requirements. However, the alternative explanation for the contradictory findings presented in Section 6.1 reveals how combining high levels of both GES and export responsiveness can result in strategic inefficiency and, consequently, lower firms' overall competitiveness in foreign markets. Thus, considering that the main effect of GES is positive, particularly under low levels of export responsiveness, what constitutes 'fit' in this study's context is defined by the extent to which a given strategy can be designed and executed cost-effectively. A major theoretical implication of the study's findings is that research should consider the trade-offs between strategic effectiveness and efficiency when applying the strategic alignment perspective to identify relevant contingencies for the performance consequences of green strategies.

The study also makes empirical contributions with implications for future research. Its moderation analyses enhance existing understanding of the boundary conditions under which green strategies or practices benefit international firms. Prior studies have primarily examined how such strategies enhance firm performance but often lack insight into the internal and external conditions that determine when these strategies pay off (e.g., Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023; Singh et al. 2024). Building on Bıçakcıoğlu et al.'s (2020) study, which identifies environmental orientation, green product differentiation and cost leadership as moderators of the relationship between export strategy and export financial performance, this study identifies foreign customer green concern and export responsiveness as moderators of the export performance effect of GES.

More importantly, by employing slope and Johnson–Neyman analyses, the study generates richer insights, helpful for understanding why some studies report that green strategies improve the performance of international firms (e.g., Bıçakcıoğlu-Peynirci and Tanyeri 2022; Silva et al. 2023; Singh et al. 2024), while others find no significant performance effects (e.g., Al-Ghwayeen and Abdallah 2018; Li and Li 2024; Xu et al. 2018). The study analysis reveals that both the magnitude and direction of the effect of GES on export performance depend on the type of organizational contingency (foreign customer green concern vs. export responsiveness) and its intensity (low vs. high). Without considering these factors, we will lack a clearer understanding of the performance effects of green strategies.

Furthermore, by revealing how the export performance benefits of GES vary based on the degree of foreign customer green concern and export responsiveness, this study refines the underexplored assumption that green strategies are desirable for international firms, especially exporters from developing and emerging economies (Chang 2024; Singh et al. 2024). Collectively, the study's findings advance the underdeveloped empirical knowledge of how and when green strategies benefit exporters from developing countries.

### 6.3 | Practical and Policy Implications

As environmental policies and pressures increase in global markets, this study reinforces the prevailing view in the literature that exporters from developing countries can generally leverage GES for successful internationalization. However, the findings also suggest that these exporters should carefully consider both internal and external environmental factors to guide their investments in GES. The study provides two key insights for exporters:

First, exporters must recognize that the importance customers place on environmental issues varies across foreign markets. They should categorize these markets based on the level of customer emphasis on environmental protection. Given the resource constraints often faced by exporters from developing countries, it is advisable to tailor GES investments according to the specific green requirements of each market, rather than adopting a one-size-fits-all approach. Increased investment in GES is likely to yield better returns in markets where customers prioritize environmental sustainability.

Second, while being responsive to foreign market demands is crucial for success, developing the capacity for such responsiveness can be costly. If exporters lack the appropriate resources (e.g., technologies), an increased focus on both GES and export responsiveness may lead to inefficiencies and undermine cost leadership. Exporters that encounter challenges in addressing these resource or capacity needs should be cautious when enhancing their emphasis on GES and export responsiveness. Specifically, while these exporters work to build the necessary capacity for cost-effective operations, they might consider prioritizing either a high emphasis on GES with lower export responsiveness or focusing on a low emphasis on GES combined with high export responsiveness to optimize their competitiveness. In making these choices, they must also consider the extent to which the target foreign markets demand green products and operations.

Considering that exporters from developing countries face significant resource constraints, we recommend that they explore and leverage low-cost resources to balance GES and export responsiveness. For instance, it is relatively inexpensive for exporters to use social media and other online platforms to identify and monitor emerging green issues in their foreign markets. Similarly, building networks with downstream channel members (e.g., distributors and retailers) in those markets can help them access such information. Both of these resources can also enable exporters to gather timely market feedback. Although these types of information can be acquired at low cost, they are not only useful for designing and implementing GES but can also allow firms to respond more quickly to market changes. Overall, such low-cost resources can support exporters from developing countries in pursuing both GES and export responsiveness cost-effectively.

Government and non-government institutions can provide a range of resources (e.g., financial, managerial, informational, and technological) to help exporters from developing countries build the capabilities needed to cost-effectively pursue both GES and export responsiveness. Green issues (e.g., policies, pressures, opportunities and solutions) are continually evolving worldwide. Agencies such as the Ghana Export Promotion Authority (GEPA) can establish dedicated units to monitor these developments and provide tailored advisory and training services to export manufacturers. Such support should also extend to guiding exporters on how to design, produce, package and market products that address green issues in specific foreign markets. These initiatives can help reduce exporters' costs of doing business. Again, the government should make deliberate efforts to provide conditional green financing to incentivize export manufacturers to adopt GES. This would cushion the financial burden and motivate exporters to commit to environmental sustainability, especially given that GES adoption can be costly for resource-constrained firms. Finally, the Ministry of Trade, in collaboration with private sector actors, can scan and disseminate intelligence on international market issues. Sharing such information with exporters can help them act quickly and effectively in response to foreign market requirements while lowering the cost of developing export responsiveness capabilities.

### 6.4 | Limitations and Future Research

This study has certain methodological and theoretical limitations. The data were collected from a single context (i.e., export manufacturers in Ghana), which limits the generalizability of the findings to all developing-country exporters or other international firms (e.g., multinational enterprises). To assess the generalizability of the study's results, future research could consider data from other developing-country exporters, as well as from exporters from emerging or developed countries. The opportunities and challenges associated with green manufacturing can vary depending on exporters' home countries. Therefore, exporters' capacity to operate cost-effectively may be contingent upon the level of economic development of their home country. Moreover, while this study focused on export manufacturers, the level of home-country green-related stakeholder pressure or liability of foreignness they experience may differ from that faced by firms in other industries (e.g., services). Therefore, data from other industries could also be used to examine whether the study findings apply more broadly across multiple export industries.

Additionally, the study used cross-sectional survey data. This data structure is consistent with those used by prior related studies (see Table 1) and is generally suitable for examining explanatory hypotheses grounded in relevant theory (Rindfleisch et al. 2008). However, it limits our ability to make causal inferences from the study's findings. It is likely that the net strategic benefit of GES, if any, will take a reasonable time to manifest. Therefore, using a longitudinal survey design, research could examine whether changes in GES cause export performance to increase or decrease, and if so, by what margin. Such a design could help examine whether and how the export performance benefits of GES change over time.

Furthermore, the characteristics of the study's sample (e.g., developing country exporters, the majority of whom are small and medium-sized enterprises) prevented us from obtaining secondary data for validation purposes or mitigating concerns about common method bias. Although the survey was designed and executed to minimize measurement errors (as evidenced by the measurement analyses performed), using reliable and valid alternative secondary data sources would have strengthened the research design. We encourage future research to explore ways to address these methodological concerns. Besides exploring secondary data sources, future research could consider obtaining data from multiple key respondents within each firm. For instance, GES data could be provided by the export manager or CEO, while export performance data could be obtained from the accountant or CEO, depending on the size of the exporter and the availability of key respondents.

A key theoretical limitation of this study is that its conceptualization of the concept of 'fit' is based on a two-way interaction analysis; however, the 'fit' produced by such interactions can also depend on other organizational contingencies (Donaldson 2006). Although we used a trade-off logic to explain the study's contradictory findings, the integrative perspective of competitive priorities suggests that firms can still cost-effectively pursue both GES and export responsiveness by expanding their asset frontiers (i.e., structural choices in resource investment) (Lapré and Scudder 2004). In the context of this study, where the sample comprises mainly small and medium-sized exporters, the cost-effectiveness of pursuing both GES and export responsiveness may be limited by their inability to invest in technologies that facilitate cost-efficient operations. For example, supply chain connectivity and analytic technologies can help exporters quickly gather, process, and share market information more efficiently and effectively. In this way, such technologies can enable exporters to concurrently emphasize both GES and export responsiveness more cost-effectively to drive export performance. Therefore, a more accurate and nuanced understanding could be gained if future research considers a three-way interaction analysis when applying the strategic alignment perspective to examine the conditions under which GES influences specific firm performance outcomes.

Finally, this study does not examine the mediators of the relationship between GES and export performance. Building on prior studies that have addressed this limitation (e.g., Al-Ghwayeen

and Abdallah 2018; Li and Li 2024; Xu et al. 2018), future research could explore additional mediating mechanisms. For example, the ability of export firms to market their products effectively may serve as a pathway through which they derive benefits from GES. Our theoretical arguments also assume that GES generates reputational advantages, which in turn help drive export performance. However, our empirical analysis does not test whether reputational advantage mediates the GES–export performance relationship. Beyond reputational advantage, future research could examine other implicit or explicit causal mechanisms (e.g., liability of foreignness) that underpin our theorization regarding the link between GES and export performance.

## Conflicts of Interest

The authors declare no conflicts of interest.

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