

# The Dynamics of ESG Performance in Global Supply Chains: A Multilevel Approach

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## 1. Introduction

With the advance of globalization and technological innovation, companies have developed complex networks of multinational suppliers. Integrating and optimizing the entire supply chain is essential for efficient operations and maintaining competitiveness. In addition, supply chain regulations such as TNFD, EU CSDDD (Corporate Sustainability Due Diligence Directive), etc., and the growing consumer awareness of sustainability are compelling companies to extend their ESG efforts to the entire supply chain. This study evaluates supply chain ESG performance on a global scale and examines the relationships between customer and supplier ESG performance. In addition, we initially introduced inclusive wealth, a comprehensive monetary measurement of sustainability, as a country-/region-level factor influencing corporate ESG performance and supply chain ESG performance.

## 2. Methodology

This study utilized a global ESG database from 2014 to 2022, collected from Refinitiv. In identifying supply chain relationships, we used the "Value Chains Relationship Confidence Score" which Refinitiv defines as the reliability of the value chain relationship between companies based on news and disclosure documents. As shown in **equation (1)**, the supply chain ESG performance score is the weighted average ESG score of value chain firms. For object firm  $i$  in year  $t$ , the weight of each value chain firm  $j$  depends on its confidence score, firm size (logarithm of the number of employees), and whether it belongs to the same country or industry as firm  $i$ , which is considered key factors influencing the supply chain relationship (Bals & Tate, 2018).

$$\text{Supply Chain ESG Score}_{it} = \sum_j \text{ESG Score}_{ijt} * \text{Confidence score}_{ijt} * \text{Firm size}_{ijt} * \text{Country Industry}_{ijt} \quad (1)$$

By using multilevel regression models, we examined the relationship of the ESG performance between investigated firms and their supply chain firms, and the country/region effect on the supply chain ESG performance. ESG scores are indicated by overall ESG, environmental, and

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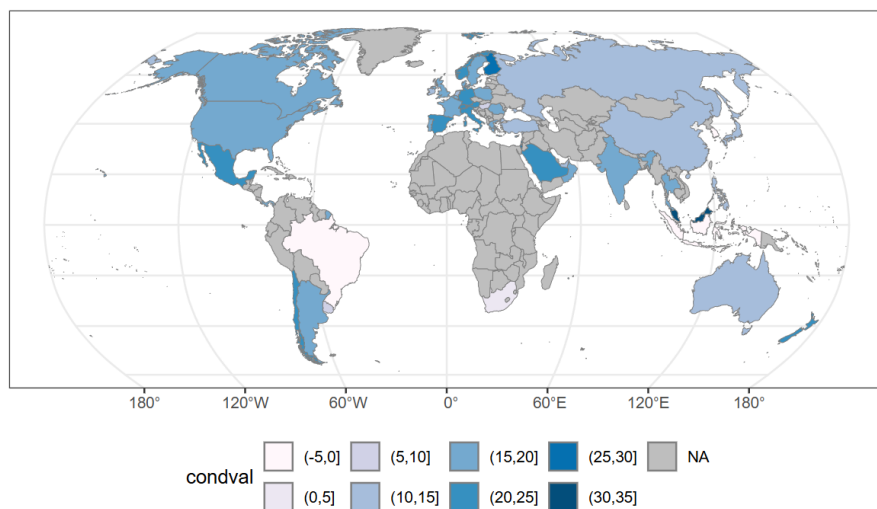
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social scores, respectively. All models control for firm size, ROA, and net sales of the object firm.

### 3. Results

The main findings are as follows. First, there is a significant and positive relationship of ESG performance between customer and supplier firms, with the impact of customer firms on supplier firms being stronger than their counterparts. Second, supply chain ESG performance differs across countries/regions after controlling for firm-level effects. For example, for environmental performance, firms located in the EU, North America, and South Asia have higher environmental scores (see **Figure 1**). The country-level factor of inclusive wealth has no significant effect on the supply chain ESG performance. However, it does significantly affect the performance of domestic firms, which in turn exert pressure on their suppliers. Third, there is a catch-up effect for companies not covered by the EU CSDDD.



**Figure 1.** Country/Region effects on the supply chain environmental performance

### 4. Conclusion

Supply chain ESG performance primarily improves due to pressure from customer firms. Additionally, country- and region-level sustainability impacts domestic firms' ESG performance but not directly their supply chains. These findings underscore the crucial role of customer firms and regional sustainability factors in enhancing overall supply chain ESG performance, highlighting the necessity for comprehensive ESG integration across multinational networks.

### References

- Bals, L., & Tate, W. L. (2018). Sustainable Supply Chain Design in Social Businesses: Advancing the Theory of Supply Chain. *Journal of Business Logistics*, 39(1), 57–79.  
<https://doi.org/10.1111/jbl.12172>