



Country ESG Ratings Based on Composite Indicators: Evidence from the European Union

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Measuring sustainable development has been a prioritized agenda for the European Union (EU), highlighted by the adoption of the United Nations 2030 Agenda in 2015. (United Nations, 2023, <https://sdgs.un.org/goals>) This comprehensive methodology defined 17 Sustainable Development Goals (SDG) grounded in 102 specific variables. (SDG Transformation Centre, 2023, <https://www.sdgindex.org>) However, the complexity of the measurement framework is a limitation of its effective integration. Data collection requires data from both official sources and a range of unofficial paid sources, including non-governmental databases.

This paper explores SDG composite indicators across the 27 EU member states, with the intent of introducing a simplified methodology for measuring environmental, social, and governance (ESG) performance. The authors used composite indicator theory to conduct the analysis, as outlined in Freudenberg (*OECD Science, Technology and Industry Working Papers*, 2003, <https://doi.org/https://doi.org/10.1787/405566708255>).

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The dataset includes only 30 specific variables that were carefully selected based on their validity, public availability and completeness of the dataset, which were then categorized into pillars (Online Supplemental Appendix (OSA) Table 1). The research hypothesis was: A simplified framework for calculating national ratings, grounded in composite indicators, will generate outcomes that align with more than 75% consistency when compared to the results procured through more elaborate, conventional methodologies.

This simplified model can be an effective alternative to the SDG methodology. The importance of this research lies in its potential to mitigate the complexity and data inconsistency that currently hinder practical ESG evaluation. By offering a more straightforward measurement framework, the paper aims to facilitate the efficient implementation of sustainable policies, thereby accelerating the EU's progress in achieving its SDGs.

The newly announced EU Corporate Sustainability Reporting Directive, referred to as Directive (EU) 2023/2464, effective 5 January 2023, imposed strict disclosure requirements for annual financial reports and newly for sustainability reports. Integrating corporate and government ESG frameworks improves general understanding of sustainability management. This unified approach enables the development of coordinated strategies to address complex global issues effectively. Based on corporate social responsibility research (Dathe et al. *Sustainability and Environmental Social Governance*, 2022), a balanced approach to sustainability reports is essential for companies. Large companies can significantly influence sustainability issues through innovation (Scheyvens et al., *Sustainable Development*, 2016; Porter and Kramer, *Harvard Business Review*, 2011).

The data were selected from publicly available sources to ensure their integrity. The primary dataset was from the World Development Indicators (World Bank, 2022, <https://wdi.worldbank.org/tables>), which provide information on 68 indicators across 239 countries. Data were also drawn from the Sustainable Development Report 2023 (Sachs et al., 2023, <https://sdgtransformationcenter.org/reports/sustainable-development-report-2023>), which consists of 94 indicators for 163 countries, and from the OECD Library (OECD, 2022, <https://www.oecd-ilibrary.org/statistics>), focusing specifically on the EU-27. The paper analyses the three main pillars, focusing on each category's ten most valuable indicators. The availability of reliable and consistent data guided the selection of indicators. Furthermore, it was essential to ensure that the indicators were closely related to the study's objectives, so that the analysis accurately reflected the intended aspects of each pillar. The data for this research were compiled for the EU-27 countries over 2000–2021.

Quartiles for thresholding were formulated initially, as detailed in OSA Table 2. Subsequently, composite indicators were formulated as described in OSA Table 3. The simplified model offers a nation's sustainability rating. Then, the calculated composite indicators were subjected to minimum and maximum value identification. The obtained range was then divided into four equal segments to determine threshold values for both types of indicators. According to both assessment methodologies, this simplified algorithm aims to classify each country into one of the four quadrants (Q1 to Q4). The detailed breakdown of these classifications is shown in OSA Table 2. This approach helps in the comparative analysis of countries' sustainable

development and corporate governance performance. Denmark, Sweden, and Finland emerged as the top performers in the ESG rating comparison. These countries made notable strides in reducing greenhouse gas emissions, increasing renewable energy usage, and enhancing waste management practices. In contrast, Bulgaria, Lithuania, and Romania registered the lowest index ESG scores among the EU-27 nations, indicating a need for intensified efforts in sustainability.

Finally, the objective was to test the hypothesis, which predicts that the results of a simplified algorithm will be consistent in 75% or more of cases. OSA Table 3 was used to investigate the stability of the rankings generated by this simplified model. Our findings confirmed that the algorithm's results were consistent 78% of the time. The composite indicators achieved identical rankings for 21 of the 27 EU member states, demonstrating that these countries maintained their position within the same quartile, as shown in OSA Table 3.

Moreover, the approach serves as a valuable tool for investors and policymakers to make well-informed decisions and evaluate the long-term sustainability of a nation's economy. By providing a simplified algorithm, this research contributes to the existing literature on ESG performance and disclosure, enabling the monitoring and comparison of sustainability performance across nations. Future studies should be conducted within specific economic situations to explore the impact on EU member states' ESG ratings.

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