Chapter 18
Homogenous Groups in EU Member States According to Common Indicators of Sustainable Development

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ABSTRACT

Sustainability is a global principle highlighting the interconnectedness of economic, social, and environmental dimensions. Sustainable development is a challenge not only for the EU but for the entire world. This chapter aims to examine the 27 EU Member States using cluster analysis. Five indicators were included in the examination and these represents all EU 27 sustainable development strategies. Indicators were compared with GDP and HDI, the two most relevant indicators of economic development and human well-being. The research posed the question: can we identify homogeneous groups of countries regarding sustainability among the 27 EU Member States? The analysis revealed that when clustering based on GDP, the Member States typically fell into two, three or four clusters. In contrast, when clustered according to the HDI, the number of clusters varied between two and four. Ultimately, four distinct clusters emerged: cutting-edge, fast-growing, prudently advanced, and tail-enders. The performance of Member States can be identified according to their positions within these clusters.

INTRODUCTION

Sustainable development, as a global principle, highlights the need for an integrated approach where economic, social, and environmental dimensions work together to address challenges effectively. This interconnectedness implies that no single dimension can independently resolve complex problems (Baják, 2013). Sustainability focuses on achieving long-term growth while preserving resource stocks for future generations, avoiding their depletion (Fleischer, 2007). The scope of sustainable development extends beyond national borders, requiring a global perspective that indicates intergenerational responsibility. It encompasses medium- and long-term goals across economic, social, and environmental domains (Ober-

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er & Erkollar, 2011). However, as noted by Dell'Angelo et al. (2017), while sustainable development is fundamentally simple and vital, its practical application through concrete rules or criteria remains challenging and is often misunderstood.

Brundtland Commission introduced the term "sustainable development" in its 1987 report, *Our Common Future*. However, the concept emerged from earlier milestones, such as Rachel Carson's influential book *Silent Spring* and the Stockholm Conference of 1972 (Mebratu, 1998). The Brundtland Commission's framework became a cornerstone for subsequent global conferences and events, inspiring widespread efforts to prioritize environmental protection and transform societal perspectives.

The events discussed here pave the way to today's sustainable development framework, outlined in *Transforming Our World: The 2030 Agenda for Sustainable Development* and reflected in the sustainable development strategies and indicators adopted by the 27 EU Member States (Walsh et al., 2020). This chapter aims to analyze the 27 current EU Member States using cluster analysis over 2015–2022, grouping them into homogeneous categories that best represent their sustainable development performance. The theoretical foundation of this chapter raises the question of *How many homogeneous groups can be formed for the 27 Member States of the European Union.* The resulting hypothes*is is: "Based on the five common sustainable development indicators included in the sustainability strategies of the 27 EU Member States, groups of countries can be formulated with homogeneous characteristics that are distinguishable and characterizable in terms of GDP and HDI indicators.*

Country-level analysis is essential because sustainability and sustainable development are increasingly prominent research areas and are expected to become key drivers of territorial competitiveness in the face of global climate change (United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2020). The design and objectives of the 2030 Agenda for Sustainable Development form the foundation for sustainability strategies implemented by nations and major cities. Looking ahead, sustainability will play a crucial role in shaping territorial competitiveness (Organisation for Economic Co-operation and Development [OECD], 2016). For future studies on territorial competitiveness among groups of countries, a valuable starting point is to categorize countries into homogeneous clusters, as this approach highlights the sustainability indicators (factors) with the greatest influence on the grouping.

The selected indicators – GDP, long-term unemployment rate, gross domestic R&D expenditures, public debt, greenhouse gas emissions, and areas under organic farming – are already well-established components of competitiveness measurement and contribute to the HDI indicator. These indicators were chosen because, after analyzing the sustainable development strategies and associated indicators of the 27 EU Member States, they were consistently included across all strategies. Cluster analysis is crucial for advancing this research. The author explored the clustering potential of EU Member States using GDP and HDI as key indicators. By implementing clustering, researchers can identify high-performing clusters to pinpoint best practices, develop tailored policies to address common challenges within each group, and foster cross-border collaboration among Member States in the same cluster. Clustering EU Member States based on sustainable development involves grouping countries with similar sustainability performance or characteristics. This approach helps uncover patterns, shared challenges, and opportunities for cooperation. The results of this analysis represent novel research and offer fresh insights into sustainable development strategies.