

Drivers of Eco-Innovation: Evidence from European Countries

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Abstract

This study investigates the key drivers of eco-innovation across European countries using data derived from the Eco-Innovation Scoreboard framework. Eco-innovation is conceptualized as the result of interactions between financial inputs, human capital, institutional engagement, and broader socio-economic conditions. The main objective of the study is to identify the factors shaping eco-innovation performance, measured by the number of eco-innovation-related patents.

The empirical analysis is based on a cross-sectional dataset for 2024 covering 27 European countries. A multiple linear regression model is employed to assess the impact of selected explanatory variables, including R&D expenditures, employment in environmental sectors, number of researchers, GDP per capita, ISO 14001 certifications, and exports of environmental goods and services. These variables reflect key dimensions of eco-innovation inputs, activities, and socio-economic conditions.

The results indicate that GDP per capita plays a central role in fostering eco-innovation, highlighting the importance of economic development for environmental technological progress. Moreover, knowledge-related factors, such as R&D expenditures and the number of researchers, as well as international market engagement reflected by environmental exports, contribute positively to eco-innovation performance. The findings emphasize that eco-innovation is driven by a combination of economic capacity, innovation resources, and integration into global markets.

The study contributes to the literature on eco-innovation by providing empirical evidence on its determinants at the country level. The results offer important policy implications, suggesting that strengthening innovation systems, supporting knowledge creation, and enhancing international competitiveness can effectively stimulate eco-innovation across Europe.

Keywords: eco-innovation, green R&D, environmentally friendly patents, European Innovation Scoreboard