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Mamghaderi, M., Mamkhezri, J., [Mohsen Khezri](#) (2023)

[Assessing the environmental efficiency of OECD countries through the lens of ecological footprint indices](#)

Abstract:

Environmental efficiency plays a crucial role in achieving sustainable economic development. This study aims to enhance the current understanding of dynamic environmental efficiency by using Data Envelopment Analysis (DEA) in conjunction with the ecological footprint index. This study evaluates 27 OECD countries' environmental performance from 2000 to 2017, employing net capital stock, labor force, and energy consumption as inputs, ecological footprint as undesirable output, and GDP as desirable output. We utilize 16 window Slack-Based Measurement DEA (SBM-DEA) models, each representing consecutive years within the observation period. Additionally, we adopt the Global Malmquist-Luenberger Index (GMLI) techniques to facilitate a simultaneous evaluation of the efficiency levels for each country. Our findings reveal that the United Kingdom and Lithuania were the most and least ecologically efficient countries among the 27 OECD countries, respectively. Over the 18-year observation period, all countries showed both progress and setbacks in environmental efficiency, with a modest overall improvement. Poland, Denmark, Slovakia, and Lithuania were the most improved countries in environmental performance, while Canada and Japan showed the most significant regressions in environmental efficiency. We highlight the need for policymakers to prioritize sustainable economic growth and consider ecological footprints when making economic decisions to enhance environmental efficiency in OECD countries. Our findings have can guide policymakers in designing effective policies and strategies to enhance environmental efficiency and promote sustainable economic development.

Keywords: Organisation for Economic Co-Operation and Development, *Efficiency, Sustainable Development, Poland, Economic Development, Ecological footprint, Environmental efficiency Gmli, OECD Countries, Window SBM-DEA

[Mohsen Khezri](#) Contact Info:

✉ m.khezri@lse.ac.uk

mohsen.khezri.eco@gmail.com

[Mohsen Khezri](#) Available at :

Google scholar: https://scholar.google.com/citations?user=KUkvx_MAAAAJ&hl=en

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=57211325495>

ORCID: <https://orcid.org/0000-0002-0862-3814>

ResearchGate: <https://www.researchgate.net/profile/Mohsen-Khezri>

Web of Science: <https://www.webofscience.com/wos/author/record/HMW-1964-2023>

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