Composite indicators of eco-efficiency in generalized IO models

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Abstract

The main goal of the presentation is to outline a new multivariate approach to measuring eco-efficiency in generalized IO models. In order to take into account the data on multiple desired and undesired factors we use weights constructed from the matrix of factor loadings resulting from PCA. Next we group the individual indicators with the highest factors loadings into two composite indicators. In contrast to traditional DEA-based approach the new proposal allows taking into account the detailed data on interindustry flows in an economy. Moreover, the performance analysis may be conducted separately from supply- and demand-side-oriented perspectives.

In order to illustrate possible applications of the new approach we conduct an empirical analysis aimed at identifying the eco-efficient sectors in Poland based on WIOD database. In addition to calculating the respective indices of eco-efficiency we also discuss the usefulness of the approach in formulating policy recommendations.

Keywords: generalized input-output models, intersectoral linkages, eco-efficiency, nonlinear optimization.

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