productivity factor on which we condition the input demand of the observed inputs. Our model of unobserved technological differences can equivalently be represented in terms of unobserved input levels --labelled as virtual capital -- that guarantee data consistency with our behavioural assumption, and we argue that this avoids the so-called transmission bias in a natural way. Our empirical application to Belgian manufacturing data shows that our method allows for drawing strong and robust conclusions, despite its nonparametric orientation. For example, our results show how input cost shares (including virtual capital costs) vary over time and pinpoint a clear link between outsourcing and technology.

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Author(s): Seddigheh Babaee, Yongjun Shen, Elke Hermans, Mehdi Toloo, Tom Brijs and Geert Wets

Title: **A common weight multiple layer DEA approach to assess road user behaviour in Europe**

Abstract: Application of DEA for constructing composite indicators has lately received considerable attention as a powerful tool for performance evaluation, benchmarking and decision making. However, the full flexibility of DEA in selecting the weights, on the one hand, raises the issue of compensability and on the other hand, it leads to different sets of weights for DMUs, which deter the comparison among them on a common base. To overcome these shortcomings, imposing weight restrictions for the first issue and applying a common set of weights for the second one was developed in the DEA literature. However, none of the common weights approaches take the information in the layer hierarchy of indicators into account. In this paper we propose a new approach for developing an optimal set of weights to evaluate all DMUs simultaneously while taking the hierarchical structure of the indicators into account. With an improved discriminating power, it leads to composite indicator values composed of similar weights, which is essential for fair comparison of DMUs. The usefulness of the proposed model is illustrated by constructing a composite road user behaviour index for a set of European countries.