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Nonparametric Frontier Approach

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# Constructing Meaningful Environmental Indices: A Nonparametric

## Frontier Approach

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**Abstract:** Environmental information disclosure programs seek to motivate firms to reduce their environmental impact. A variety of environmental impacts are reported in these programs and often this information is aggregated into a composite environmental index (CEI) for easier communication. The challenge is to create a meaningful index that allows environmental performance to be compared over time and space without ambiguity. In this paper, we argue that it is important to develop a cardinally meaningful and standardized CEI and use a nonparametric frontier approach to constructing such an index. This approach has the advantage to handle issues associated with data irregularity and the mixed measurability of underlying variables. We apply this approach to construct a CEI for evaluating the environmental performance of manufacturing facilities in different industrial sectors in Los Angeles based on data from the toxic release inventory. We show how the CEI can be used to improve facility-level environmental performance. A sensitivity analysis is conducted with respect to the uncertainty in data accuracy, which demonstrates the robustness of the nonparametric frontier approach in constructing meaningful environmental indices.

**Keywords:** Environmental index; Measurability; Toxic Release Inventory (TRI); Environmental performance; Data envelopment analysis

**JEL Codes:** C43, C61, Q50

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