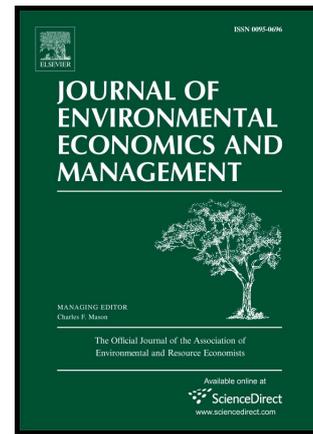


# Author's Accepted Manuscript

Constructing Meaningful Environmental Indices: A  
Nonparametric Frontier Approach

P. Zhou, M.A. Delmas, A. Kohli



[www.elsevier.com/locate/jeem](http://www.elsevier.com/locate/jeem)

PII: S0095-0696(17)30223-1  
DOI: <http://dx.doi.org/10.1016/j.jeem.2017.04.003>  
Reference: YJEEM2019

To appear in: *Journal of Environmental Economics and Management*

Received date: 9 January 2016  
Revised date: 7 April 2017  
Accepted date: 10 April 2017

Cite this article as: P. Zhou, M.A. Delmas and A. Kohli, Constructing Meaningful Environmental Indices: A Nonparametric Frontier Approach, *Journal of Environmental Economics and Management*, <http://dx.doi.org/10.1016/j.jeem.2017.04.003>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Constructing Meaningful Environmental Indices: A Nonparametric

## Frontier Approach

P. Zhou <sup>a,\*</sup>, M.A. Delmas <sup>b,\*</sup>, A. Kohli <sup>b</sup>,

<sup>a</sup> *College of Economics and Management, Nanjing University of Aeronautics and Astronautics, 29 Jiangjun Avenue, Nanjing 211106, China*

<sup>b</sup> *Institute of the Environment and Sustainability, University of California, Los Angeles La Kretz Hall Suite 300, Los Angeles, CA 90095-1496*

---

**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 cardinality 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

---

## Acknowledgments

We would like to thank the Journal Co-Editor-in-Chief Till Requate and two anonymous referees for their invaluable comments and suggestions on an earlier draft of this manuscript. P. Zhou is also grateful to the financial support provided by the National Natural Science Foundation of China (nos. 71625005, 71573119 & 71273005).

---

\* Corresponding authors.

E-mail addresses: delmas@ucla.edu (M.A.Delmas), rocy\_zhou@hotmail.com (P. Zhou).

Download English Version:

<https://daneshyari.com/en/article/5100370>

Download Persian Version:

<https://daneshyari.com/article/5100370>

[Daneshyari.com](https://daneshyari.com)