The hybrid returns-to-scale model and its extension by production trade-offs: an application to the efficiency assessment of public universities in Malaysia

Podinovski, V.V. a, Wan Husain, W.R. b

aWarwick Business School, University of Warwick, Coventry, United Kingdom
bBusiness Administration Department, KENMS, International Islamic University Malaysia, Jalan Gombak, Kuala Lumpur, Malaysia

Abstract

Most applications of data envelopment analysis (DEA) employ standard constant or variable returns-to-scale models. In this paper we suggest that these models may sometimes underutilize our knowledge of the underlying production process. For example, in the context of higher education considered in the reported application, individual universities often maintain a certain student-to-staff ratio which points that there should be an approximately proportional relationship between students and staff, at least in the medium to long run. A different example is an observation that the teaching of postgraduate students generally requires more resources than the teaching of the same number of undergraduate students. In order to incorporate such information in a DEA model, we propose a novel approach that combines the recently developed hybrid returns-to-scale DEA model with the use of production trade-offs. The suggested approach leads to a better-informed model of production technology than the conventional DEA models.

We illustrate this methodology by an application to Malaysian public universities. This approach results in a tangibly better efficiency discrimination than would be possible with the standard DEA models. © 2015, Springer New York LLC

Author keywords

Data envelopment analysis, Higher education, Hybrid returns to scale, Malaysia, Production trade-offs

ISSN: 02545330
DOI: 10.1007/s10479-015-1854-0
Source Type: Article
Original language: English
Publisher: Springer New York LLC