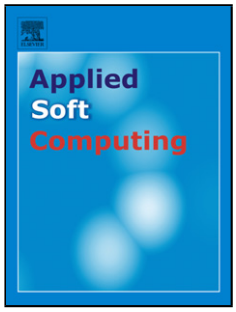

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Efficiency Evaluation in Two-stage Data Envelopment Analysis under a Fuzzy Environment: A Common-Weights Approach

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Highlights

- We look into internal structures of a production system to assess its performance.
- We present a common-weights DEA method for two-stage structures with fuzzy data.
- We assess the efficiency of the system and component processes.
- The new approach is illustrated through a numerical example.

All additions and changes to the first revision are highlighted in this revision.

Abstract

Data envelopment analysis (DEA) has been genuinely known as an impeccable technique for efficiency measurement. In practice, since many production systems such as broadcasting companies, banking and R&D activities include two processes connected in series, we have need of utilizing two-stage DEA models to identify the sources of inefficiency and explore in turn appropriate options for improving performance. The lack of the ability to generate the actual weights is not only an ongoing challenge in traditional DEA models, it can have serious repercussion for the contemporary DEA models (e.g., two-stage DEA). This paper presents a common-weights method for two-stage structures that allows us to consider equality of opportunity in a fuzzy environment when evaluating the system efficiency and the