Title: Efficiency Analysis Based on DEA from Multiple Perspectives

Author(s): Yang, Xiaopeng

Citation

Issue Date

Text Version: ETD

URL: http://hdl.handle.net/11094/1668

DOI

rights

Note

Osaka University Knowledge Archive: OUKA

https://ir.library.osaka-u.ac.jp/repo/ouka/all/

Osaka University
The thesis focuses on efficiency evaluation and improvement of systems based on data envelopment analysis (DEA) from multiple perspectives which have distinctive input/output classifications to the attributes of decision making unit (DMU). By incorporating Nash bargaining game (NBG) theory, the research concerns the following three aspects: (1) Improve the existing efficiency evaluation model in DEA research by utilizing the desirable and undesirable attribute classification method; (2) In order to obtain the highest efficiency score, different perspectives tend to select different weight assignment schemes, even in evaluating the same DMU. In order to balance multiple perspectives based on their market statuses and evaluate DMUs more objectively, we propose a new DEA model incorporating NBG theory, which focuses on seeking an identical weight assignment scheme to cater to multiple perspectives. An application about Chinese 20 banks is given to show the equilibrium evaluation results by the model we propose. (3) Select an appropriate scheme to improve inefficient systems to the state of Pareto optimality for multiple perspectives, which can avoid discontentment of some perspectives. The method is used in a concrete case study about Japanese banking industry to demonstrate the advantages of our research.

Keywords: data envelopment analysis (DEA); multiple perspectives; decision making unit (DMU); Nash bargaining game (NBG); bank.