A super-efficiency data envelopment analysis for ranking efficient surgical units of a hospital

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Data envelopment analysis (DEA) is a method to evaluate the performance of organizations. Hospital management is one of the areas in which the DEA is frequently used for efficiency measurement. The aim of this study is to analyze the efficiency of 10 surgical services of a hospital through the DEA and also ranking the units based on the super-efficiency approach. In the literature of DEA, the units whose efficiency is measured are named as decision-making units (DMUs). The units of this study are summarized in Figure 1 and the inputs and outputs of the units are given in Figure 2. The problem and its data set are taken from a study in the literature cited under the figures, in which 8 units have been identified as efficient based on the BCC model and then they have been ranked through the gray relational analysis (GRA). We compare the results of the article with the efficiency values that we have obtained with other DEA models using the GAMS program. We also present the rank values of the units which have been acquired based on the super-efficiency model. In last, after discussing the difference between the results and the advantages and disadvantages of the methods, suggestions, and comments are presented to improve the efficiency of the units.

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