

Four types of dependence relationship in two consecutive stage data envelopment analysis model

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ABSTRACT

Data Envelopment Analysis (DEA) model usually does not consider the interaction between the decision making units (DMU). The interaction can be represented in the form of two consecutive stages in which the outputs from the precedent stage will be the inputs for the latter stage. The two consecutive stage DEA model can be represented as Non-separable DEA (NS-DEA) which integrates both desirable and undesirable output. The undesirable output unlike desirable output, indicates a higher efficiency if the output is lower or not productive. The different orientation between desirable and undesirable output may affect the efficiency score especially if it was formed in two consecutive stages. Thus, this research attempts to address four different types of dependence relationship which can occur in the formation of two consecutive stage DEA models and to investigate the impact towards the overall efficiency of the DMUs. The finding shows that the determination of positive or negative correlation between the two stages which combines both desirable and undesirable output, are more likely to be influenced by the orientation of the first precedent stage.

KEYWORDS

Data Envelopment Analysis (DEA); Decision making

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