

Multistage Data Envelopment Analysis Model for Malmquist Productivity Index Using Grey's System Theory to Evaluate Performance of Electric Power Supply Chain in Iran

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Abstract : Evaluation of organizational performance is among the most important measures that help organizations and entities continuously improve their efficiency. Organizations can use the existing data and results from the comparison of units under investigation to obtain an estimation of their performance. The Malmquist Productivity Index (MPI) is an important index in the evaluation of overall productivity, which considers technological developments and technical efficiency at the same time. This article proposed a model based on the multistage MPI, considering limited data (Grey's theory). This model can evaluate the performance of units using limited and uncertain data in a multistage process. It was applied by the electricity market manager to Iran's electric power supply chain (EPSC), which contains uncertain data, to evaluate the performance of its actors. Results from solving the model showed an improvement in the accuracy of future performance of the units under investigation, using the Grey's system theory. This model can be used in all case studies, in which MPI is used and there are limited or uncertain data.

Keywords : Malmquist Index, Grey's Theory, CCR Model, network data envelopment analysis, Iran electricity power chain

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