

Measuring air routes performance using a fractional network data  
envelopment analysis model

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Abstract

This paper aims to propose a unified framework of data envelopment analysis (DEA) model so as to facilitate legitimate comparisons of performance among the production and service processes as well as overall operations. The fractional measure network DEA (FNDEA) model is constructed by analytically stratifying the structure of an operational network according to the transport service characteristics of air routes. We compare the proposed model with separate multi-stage DEA evaluation results by using an actual data set from the domestic air routes of an airline in Taiwan. The results show that the FNDEA model is significantly different from the separate multi-stage DEA model in magnitude of performance scores. Managerial strategies for the improvement of performance for the airline are also suggested.

Keyword : Network data envelopment analysis · Air route · Fractional measure · Efficiency and effectiveness