

Efficiency and Scale Elasticity in Network Data Envelopment Analysis: An Application to International Tourist Hotels in Taiwan

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Abstract : Efficient operation is more and more important for managers of hotels. Unlike the manufacturing industry, hotels cannot store their products. In addition, many hotels provide room service, and food and beverage service simultaneously. When efficiencies of hotels are evaluated, the internal structure should be considered. Hence, based on the operational characteristics of hotels, this study proposes a DEA model to simultaneously assess the efficiencies among the room production division, food and beverage production division, room service division and food and beverage service division. However, not only the enhancement of efficiency but also the adjustment of scale can improve the performance. In terms of the adjustment of scale, scale elasticity or returns to scale can help to managers to make decisions concerning expansion or contraction. In order to construct a reasonable approach to measure the efficiencies and scale elasticities of hotels, this study builds an alternative variable-returns-to-scale-based two-stage network DEA model with the combination of parallel and series structures to explore the scale elasticities of the whole system, room production division, food and beverage production division, room service division and food and beverage service division based on the data of international tourist hotel industry in Taiwan. The results may provide valuable information on operational performance and scale for managers and decision makers.

Keywords : efficiency, scale elasticity, network data envelopment analysis, international tourist hotel

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