

An Analysis of R&D Investment Efficiency & Effectiveness Using Network DEA

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<Abstract>

The purpose of this study is to estimate the efficiency and effectiveness of research and development (R&D) investment by Network Data Envelopment Analysis (DEA) for 22 OECD countries from 2006 to 2010. The Network DEA model deals with estimating the efficiency by multi-stages, while the traditional models including CCR and BCC models only estimate the efficiency as a simple ratio of input to output. This paper found the following: (1) For 2008-2010, Slovak Republic, Iceland, Ireland showed the highest overall efficiency scores, while Portugal, Turkey, and Norway have the lowest scores. Canada, Spain, Netherlands, Germany, and Hungary showed higher efficiency scores, but lower effectiveness scores. Turkey, Portugal, Italy, Norway showed vice versa. (2) From the correlation analysis, the degree of efficiency and effectiveness affects overall efficiency in a positive way. The efficiency scores have higher correlation with overall efficiency scores. (3) With some minor differences, all three methods, CCR, BCC, and Network DEA show similar results, which resulted in a robustness in estimation.