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Evaluating the logistics performance of OECD countries by using fuzzy AHP and ARAS-G

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Abstract

Logistics has become an important field as the volume of world commerce expands. The World Bank (WB) has been publishing the Logistics Performance Index (LPI) for most of the countries since 2007. LPI is accepted as an important indicator of logistical performance. In this study, a model is proposed to evaluate the LPI of the OECD countries within a specific time frame. With the proposed model, the logistical performance of OECD countries between the years 2010–2018 is analyzed and compared with the existing LPI rankings. The index is calculated using six indicators. Different from the WB survey, the fuzzy analytical hierarchy method is used to determine the weighting scores of these six indicators. The grey numbers give the researcher an opportunity to obtain the numerical expressions of a time period by showing minimum and maximum values. Thus, grey additive ratio assessment (ARAS-G) method is used to evaluate the logistics performances of OECD countries by years. The data created in this study refers to the logistics performances of the OECD countries between the years 2010 and 2018. Thus, OECD countries are ranked according to the logistics performances calculated by the ARAS-G method. The rankings calculated by ARAS-G are compared to the yearly rankings calculated by the WB. Spearman ρ and Kendall's Tau correlation methods are used to investigate the relationships within the yearly rankings and the rankings calculated for the period between 2010 and 2018 by using ARAS-G. The results show that the rankings calculated by ARAS-G have the strongest relationship with years. Indeed, this study provides a different field of study for the ARAS-G method application.

Keywords Logistics Performance Index · Multi criteria decision making · ARAS-G · Fuzzy AHP · Non-parametric correlation

JEL Classification C00 · C02

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