Multicriteria decision making modeling for international distribution center location

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Abstract

The location selection problem applied to distribution centers is a topic that has received much attention in recent years in the literature from different perspectives and methodologies. Some examples include mixed-integer linear programming [1], Fuzzy Analytic Hierarchy Process (Fuzzy-AHP), spatial statistics and analysis approaches [2], STEEP (Social, Technical, Economic, Environmental, Political) and IF-analytic hierarchy process [3], Fuzzy-Delphi-TOPSIS [4], and Dematel-ANP-TOPSIS [5]. This paper contributes to previous literature in two ways. First, it provides the application of three multicriteria decision making methods for the location of international distribution centers: Analytic Network Process (ANP), Dematel-ANP (DANP), and Fuzzy Dematel – Fuzzy ANP (FDFANP), and provides a performance comparison in the ranking of alternatives. Second, it focuses on four logistics-intensive regions in Europe: Aragon region (Spain), Rotterdam cluster (The Netherlands), Hauts-de-France region (France), and Emilia-Romagna region (Italy). After determining a broad criteria set affecting the distribution center location decisions, ANP, DANP and FDFANP methods are applied to the problem and results are presented. Comparisons of these three methods are also discussed.

References


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