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Abstract
The reduction of production cost plays an important role for business firms to survive in the highly competitive market. Then, to find the minimum value of the production cost at a given production quantity is a problem of resource allocation which can be solved to decision maker by the mathematical programming models. However, in the real-life situation, sometimes the prices of the input factors in the models are fuzzy due to lack of historical data, making the classical analysis technique not applicable. Since Bellman and Zadeh proposed the concept of fuzzy set theory, many scholars have devised fuzzy mathematical programming models and the associated solution methods for wider applications. But, most of the existing studies on fuzzy mathematical programming models only provide crisp solutions and some models are too complicated which are not suitable for the decision maker.

This paper tries to develop a generalized method to construct the factor allocation model to find the optimal production cost for the managers. When the prices of the input factor are fuzzy, the production cost will be fuzzy as well. The Yager' s ranking method is used to transform the fuzzy production cost into crisp value, and then the firm's optimal policy can be determined via the classical mathematical programming model. The method is be compared with the centroid method used in many fuzzy decision-making problems by solving some examples of different fuzzy parameters with various spreads. Three ranking methods of different types will be used to find the difference of the two methods. The results show that the Yager' s ranking method is better than centroid method when the fuzzy numbers of the input factors are disssymmetric. Finally, the solving procedure is utilized to solve the transportation problem with fuzzy cost coefficients. The results also show that the Yager' s ranking method is superior to the centriod method.
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