DISCUSSION

Comments on: Multicriteria decision systems for financial problems

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The paper under discussion is an excellent survey about Multicriteria Decision Systems and their applications in finance decisions over the past few decades, with a special focus on portfolio selection and corporate performance evaluation. Constantin Zopounidis and Michael Doumpos are leading experts in the field of Multicriteria Decision Aid (MCDA), which has become a major discipline in operations research and management science, and along with their coauthors have been actively contributing to this fascinating area of research extensively. Their remarkable findings and results are compiled in the present paper in a very well-organized manner.

Multicriteria Decision-Making (MCDM) is involved with decision problems under the presence of multiple (conflicting) decision criteria, which require the selection of the best alternatives, the ranking of the alternatives according to their overall performance, or their classification into predefined performance groups. For the chosen topic of this survey, the presentation is so thorough that is difficult to add or suggest any changes. Hence, drawing from one of my areas of expertise, which is the use of MCDM models in sustainable energy and energy efficiency, I believe it would add value to the present survey to briefly mention the application of MCDM in these areas as well, which can relate to financial decisions as they are also complex, multidimensional problems that need a flexible and customizable framework to address the peculiarities of the decision making problem. In these lines, Zhou et al. (2006) attributes the increased popularity of MCDM, especially in decision-making for sustainable energy, to the multidimensional nature of the sustainability goal and

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the complexity of the socioeconomic and biophysical systems. Furthermore, a review from Wang et al. (2009) verifies the increasing interest in using MCDM approaches in other related areas, such as energy resource allocation, energy exploitation, energy policy setting, building energy management, transportation energy systems, etc.

In Sect. 2 of the paper, the authors give a comprehensive overview of the main methodological streams in MCDA. The main fields of MCDA recognized by the authors are multiobjective optimization (MOO), multiattribute utility theory (MAUT), outranking relations such as ELECTRE and PROMETHEE, and finally, preference disaggregation analysis (PDA). In regards to the application of MCDM models in financial problems, which is the main scope of this paper, the authors are doing a great job in Sect. 3 categorizing the various literature on the subject into two main categories—return, profitability, and wealth; risk assessment and risk management—both gravitating around the risk and return trade-off, which is pivotal for any financial decision.

In Sect. 4, the authors provide a more detailed overview of the literature focusing more on two specific types of financial decisions and the respective MCDA applications, namely portfolio selection and corporate performance evaluation. In the case of the former type, special emphasis is given on the statistical descriptions of the returns distributions and the developments made in this finance field following Markowitz (1959) pioneering work on the mean-variance framework. Moreover, asset allocation is discussed along with the portfolio optimization process, with an extensive presentation of the most recent MOO methodological advances, solution algorithms and computational intelligence approaches and their applications in: multiobjective linear programming, goal programming, compromise programming, stochastic programming, fuzzy modeling, multiobjective evolutionary algorithms, and metaheuristics.

In regards to the evaluation of the financial performance of firms, there is a complete discussion on the various measures and criteria used for assessment, with a special focus on the evaluation of banks and credit scoring. The choice of the banking sector is well justified in the current economic environment and the recent financial crisis, which has its roots in the global banking system. Focusing on the MCDM applications on credit scoring is also of utmost importance in light of the regulatory framework imposed by the Basel II accord and its upcoming revision through Basel III. What is more, in Sect. 5, the authors present a comprehensive discussion on the various challenges the MCDA field is currently facing focusing mainly on the model validation issue, which is critical for all types of models used by finance professionals and regulators, the efficient and appropriate handling of big data, and finally the software implementation of various tools into userfriendly web-based applications that would facilitate an improved decision-making process.

In conclusion, this paper is a complete survey about the use of Multicriteria Decision Systems in supporting financial decision makers in modeling, analyzing and evaluating their actions in a comprehensive and a very informative way. The wideranging list of references is very helpful in finding the most up-to-date research done in the field by world-renowned researchers such as the two authors, Constantin Zopounidis and Michael Doumpos.

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