

Editorial

Managing uncertainty in decision support models

The formal models used in Operational Research/Decision Aiding (OR/DA) interventions are subject to many sources of uncertainty, imprecision, and ignorance (see Roy, 1989; French, 1995). Indeed, it is well known that setting technical and economical parameter values is often problematic: instruments and statistics can be imprecise (e.g., tolerances for precision in measurement, confidence intervals in statistics), measurement can be arbitrary and subjective (e.g., measuring noise pollution or a firm's performance), some information (e.g., data from clinical trials) may be controversial or contradictory, let alone uncertainties about the future. Setting parameter values about the preferences of a decision maker (DM) is also difficult. For him or her, value judgments are naturally easier to express through words than through numbers, and elicitation techniques often bias the responses. Furthermore, preferences may evolve, as they are often unstable outcomes of unresolved internal conflicts in the DM's mind. Other difficulties may be present, such as the need to address the concerns of a group of actors, or lack of time.

The 15th Mini EURO Conference, held in Coimbra, Portugal, from 22 to 24 September 2004, was devoted to the theme "Managing Uncertainty in Decision Support Models", aiming at discussing the issues of how to incorporate uncertainty in OR/DA models and how to recommend solutions based on such models (considering uncertainty in a very broad sense). It was organized by INESC Coimbra with the logistic support of the Faculty of Economics at the University of Coimbra, with Luis C. Dias acting as chair of the Organizing Committee and Carlos Henggeler Antunes acting as chair of the International Programme Committee.

The conference gathered 78 researchers who presented 63 papers. The geographical provenience of the authors was quite varied (Austria, Australia, Belgium, Bolivia, Brazil, Canada, China, Denmark, Estonia, Finland, France, Germany, Greece, Israel, Japan, Lithuania, Norway, Poland, Portugal, South Africa, Spain, Switzerland, Turkey, Ukraine, UK), as were the subjects of the contributions (decision analysis, decision support systems, fuzzy sets, interval programming, multi-criteria analysis, robustness analysis, rough sets, sensitivity analysis, stochastic programming, etc.), with a mix of methodological and applied papers. A proceedings volume was published as a CD-ROM (ISBN: 972-9044-52-X), including the full versions of the papers submitted to the conference, which underwent a refereeing process beforehand.

With the support of the Editors of EJOR, the authors contributing to the conference were invited to submit improved versions of their papers to this journal, where they underwent a new rigorous refereeing process supervised by the guest editors (with the exception of the paper by Oliveira and Antunes, for which the refereeing process was supervised by the Editor of EJOR). This feature issue of EJOR contains 14 papers coming out from this selection process.

The collection of papers presented in this issue is quite representative of the conference's contributions, namely regarding the relative weight of the area of multi-criteria/multi-objective decision aiding. A set of papers is related to topics of multi-objective programming: Aköz and Petrovic address goal programming using fuzzy set theory; Oliveira and Antunes overview the state of the art of multi-objective linear programming with interval coefficients; Costa addresses multi-objective linear

fractional programming with uncertainty on the weights. Also with links to multi-objective programming Ballesterio et al. deal with the selection of portfolios that are efficient regarding risk and return under uncertain scenarios and Liesiö et al. also consider the subject of portfolio selection using concepts of preference programming to deal with uncertainties about the projects' performance and the preferences of a DM.

Another set of papers is concerned with the multi-criteria evaluation of a list of alternatives. Ben Amor et al. propose a multiple criteria aggregation procedure which accepts different types of uncertainties (fuzzy, stochastic, etc.). Matos also considers different types of uncertainties and decision criteria to sustain a multi-criteria evaluation of risk when comparing decision alternatives. Contreras and Mármol address group multi-criteria evaluation problems where there is uncertainty or lack of agreement about the weight of each evaluation criterion.

Two of the papers are related to the theory of rough sets: Inuiguchi and Miyajima present a methodological paper addressing rule induction when there are two decision tables; the paper of Sanchis et al. is more application-oriented, addressing two different financial problems. Two other papers are application-oriented and use concepts of stochastic efficiency: Flaten and Lien examine optimal strategies in organic dairy systems in Norway and Lien et al. analyse optimal tree replanting taking risk aversion into account. Another application-oriented paper is provided by Pearson, who addresses the newsvendor problem in supply chain management considering simultaneously forecasts of demand and supply distributions. The contribution of Balbo et al. concerns a method to assess the flatness error found in metrology, i.e., to measure the deviation of a manufactured surface from an ideal planar shape.

There are a number of persons and entities that made this feature issue possible and the 15th Mini EURO Conference beforehand. The guest editors would like to express their gratitude to all the

authors that contributed to the conference and especially to those who have submitted their papers to this issue of EJOR. This gratitude is extended on the referees who collaborated on the revision of the papers for the conference proceedings and for this issue, and also on Roman Slowinski—the Editor of EJOR. Finally, a word of appreciation and acknowledgement is due to the members of the organizing and international programme committees, as well as the entities that supported the 15th Mini EURO Conference: INESC Coimbra, Faculty of Economics, Rectorate of the University of Coimbra, Polytechnic Institute of Coimbra, Foundation for Science and Technology, Luso-American Development Foundation, Municipality of Coimbra, Coimbra's Commercial and Industrial Association, Central Tourist Region, and Bank Espírito Santo.

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