Econometric Modelling and Prediction
The Threshold Accepting Optimisation Algorithm in Economics and Statistics*

Peter Winker\textsuperscript{1} and Dietmar Maringer\textsuperscript{2}

\textsuperscript{1} Faculty of Economics, University of Giessen
\textsuperscript{2} CCFEA, University of Essex

Summary. Threshold Accepting (TA) is a powerful optimisation heuristic from the class of evolutionary algorithms. Using several examples from economics, econometrics and statistics, the issues related to implementations of TA are discussed and demonstrated. A problem specific implementation involves the definition of a local structure on the search space, the analysis of the objective function and of constraints, if relevant, and the generation of a sequence of threshold values to be used in the acceptance-rejection-step of the algorithm. A routine approach towards setting these implementation specific details for TA is presented, which will be partially data driven. Furthermore, fine tuning of parameters and the cost and benefit of restart versions of stochastic optimisation heuristics will be discussed.

Key words: Heuristic optimisation, threshold accepting

1 Introduction

Threshold accepting is an optimisation heuristic. Reasonable features of such optimisation heuristics include the following (Barr et al., 1995, p. 12). Firstly, they should aim at good approximations to the global optimum. Secondly, they should be robust to changes in problem characteristics, tuning parameters and changes in the constraints. Thirdly, they should be easy to implement to many problem instances, including new ones. Finally, a necessary requirement is that the solution approach consists of a procedure which does not depend on individual subjective elements. We will try to demonstrate that a suitable implementation of threshold accepting fulfills these requirements.

Threshold accepting is a modification of the more often used simulated annealing (Kirkpatrick et al., 1983) using a deterministic acceptance

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