Preface

This special double issue of the Journal of Global Optimization is devoted to applications to economics.

The ultimate goal of any science is not only to describe a particular aspect of nature or reality, but also to identify the underlying laws that explain the phenomena under study. Nowadays, it is a common belief that nature always behaves in an optimal way; this was first recognized in classical mechanics, which is based on the so-called variational principles. Therefore, optimization is one of the most fundamental concepts in scientific modeling. Economics is not an exception to this rule, since in modern economic theory one typically assumes that the economic agents (consumers, firms, organizations...) do optimize. This is why much of the thrust that optimization theory has experienced since the mid-twentieth century has its origin in the needs of economic theory, as shown by the contributions that many economic theorists have made to the field.

From a mathematical point of view, dealing with local optima is a relatively easy task. As a general rule, with a moderate effort one can identify local optimality conditions and devise efficient algorithms to find local minima. The situation for global optima is exactly the opposite. However, nature is supposed to be able to find global optimal solutions without much trouble, and rational economic agents are usually assumed to have enough computational resources available or, more often, an intuition so perfect as to allow them to make globally optimal decisions. Therefore, global optimization is a fundamental tool for economic modeling. The papers in this double issue constitute a sample of the uses of global optimization theory and methods (and related mathematical techniques) in economics.

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