
Editorial

Mikael Collan* and Pasi Luukka

School of Business,
Lappeenranta University of Technology,
Skinnarilankatu 34, FIN-53851, Lappeenranta, Finland
E-mail: mikael.collan@lut.fi
E-mail: pasi.luukka@lut.fi
*Corresponding author

This special issue of *International Journal of Process Management and Benchmarking* concentrates on the themes of optimisation, benchmarking, and economic modelling and presents seven papers in that vein. Early versions of some of the papers in this special issue were presented at the 40th Anniversary Workshop of the Finnish Operational Research Society (FORS40) in Lappeenranta, Finland.

The three topic areas are all very relevant for management of the modern corporation, economic modelling and benchmarking. They often form the basis of strategic decision-making. Optimisation follows strategic decisions in helping to define and make operational decisions; this special issue presents a rather wide variety of topics from these three broad fields of research.

The first paper by Yeomans and Yang discusses a rather difficult waste management optimisation problem with considerable elements of uncertainty. The authors use a novel simulation optimisation (SO) approach that utilises a nature-inspired firefly algorithm (FA). To show the effectiveness of the new method a real world waste management problem in the Hamilton-Wentworth area, Ontario, Canada is presented and analysed, and the obtained results are compared with results from other methods. One of the main advantages of the adopted firefly-SO method is that it is computationally less demanding and results can be reached fast.

In the second paper by Dobrescu, Nastac and Pelinescu, a hybrid method based on principal components analysis (PCA) and using an artificial neural network (ANN) is introduced for the purpose of forecasting foreign exchange rates for emerging markets. Forecasting even daily (one day ahead) exchange rates by using exclusively primary available information for an emerging economy is an extremely challenging and a difficult problem. Forecasting needs to be done under volatile statistics and possibly under incomplete information – for these reasons models designed for the job must be rather flexible.

The third paper by Nurmi, Kyngäs and Kyngäs introduces the nature-inspired PEAST algorithm, which is a hybrid computational intelligence (CI) method designed for solving complex combinatorial optimisation problems. The usability of the method is showcased by presenting application of the method to two real world problems, workforce scheduling and professional sports (hockey) league scheduling, both demanding problems.

The Greek banking sector has been evaluated and benchmarked in the fourth paper by using data envelopment analysis (DEA) by Perlegkas, Sofianopoulou and Psychoyios.

Earlier research in the subject of bank efficiency benchmarking has been concentrating on the financial factors of the banking sector, in this paper also environmental factors are being taken into consideration. Efficiency of the analysed banks has been evaluated by using both financial and environmental criteria. This paper touches an important subject of environmental issues as factors to be considered in the evaluation of businesses and specifically of the banking sector – sustainability issues and environmental analysis is a topic of growing interest both in research and in business.

The fifth paper by Collan, Stoklasa and Talasova discusses academic faculty evaluation systems and presents four real-world cases of actual faculty evaluation systems in use. The paper highlights the diversity of faculty evaluation systems and compares the four cases by presenting similarities and differences of the four evaluation systems. What is revealed is that academic faculty evaluation systems are not necessarily a simple issue, but a rather complex one, as evaluation systems should be able to reflect the different types of academic achievement and to be able to allow for the flexibility found in academic work. At the same time evaluation systems should be fair and possibly consider cultural and organisational issues. The bottom line in the article is that academic evaluation systems merit more study as reporting requirements of universities by their stakeholders seem to increase with time.

In the sixth paper by Panchal, Luukka and Mattila, the authors deal with the well-known Leontief input output model, which is an analytical tool, usable in the analysis of various economic problems such as identifying the key sectors of an economy, or revealing possible bottlenecks during expansion of production. The approach presented in this paper uses fuzzy numbers to account for the uncertainty in the input output analysis. Three approaches are presented for how to deal with this type of situation where uncertainty is now model using fuzzy numbers. A number of issues differing between the original model and the presented models, such as the stopping criterion and how to deal with missing information are discussed and compared to the conventional crisp models; also the efficiency of the presented methods is studied.

The seventh paper by Martemyanov and Matveenko deals with dependences of the growth rate on the elasticity of substitution with mutual dependence of agents. The development is explained as an increase in values of the agents in a dynamic system with functions displaying a constant elasticity of substitution (CES). The paper brings out several interesting theoretical points, shows interesting lemmas and introduces a potential generalisation on the growth rate model.

The seven papers of this special issue are a window into the diversity of topics within the focus areas of this special issue. It seems that mathematical analysis, methods and mathematical modelling are making continually stronger and stronger presence felt in business and management – this may be due to the explosion of available data and the increased awareness of managers about the existence of these methods.

Acknowledgements

The guest editors are grateful to Professor Gunasekaran, the Editor-In-Chief of the *International Journal of Process Management and Benchmarking* and to the reviewers who reviewed the manuscripts submitted to this special issue. We would also like to express our thanks to all the authors.