RISK MANAGEMENT

Room: 320
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Fuzzy Optimization Models for Rolling Planning an Institution's Project Portfolio Inclusive of Risks and Corporate Social Responsibility[6]

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Abstract

The objective of this research is to develop new fuzzy multi-period optimization models for support of decision making while selecting a project portfolio in terms of strategic development program of an institution. Specifically, to expand the previously proposed crisp models for rolling portfolio planning using the tools of a fuzzy-set theory. The main difference of the proposed fuzzy models is the possibility of revision at each step of the composition of the pre-selected portfolio of projects depending on the already achieved results and changes in the external and internal conditions. As before, the verbal expert assessments of possible project impacts and emerging risks are converted into fuzzy sets, followed by formulation and solution of fuzzy optimization problems. Target functions are general specific utility functions where fuzzy arguments are levels of the institution's strategic goals achievement as results of the project implementation over periods with allowance for the significance of objectives and the amount of present expenditures in the project. The utility of the project is assumed to depend on the manner in which levels of attaining strategic objectives increase across periods, while different objectives would preferably require a different pace of increase in their levels. It is also assumed that different structures for resource investment across periods will be preferred, therefore additional fuzzy resource constraints are introduced in models for each time period. The explicit definition of the fuzzy objective function is based on the previously proposed universal method for constructing the utility functions of an arbitrary number of variables (criteria) under any interrelations between criteria. All problem constraints are also fuzzy. Fuzzy optimization problems are reduced to the crisp ones and are solved using standard methods. The use of the models introduced is illustrated on the example of the University.

Keywords: Project Portfolio Selection, Rolling Planning, Corporate Social Responsibility, Utility Function, Multi-Period Model, Fuzzy Model

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[6] The research is made with financial support of Russian Foundation for Basic Research under science project № 15-32-01027.