

A bicriteria approach identifying nondominated portfolios

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We explore a portfolio constructive model, formulated in terms of satisfaction of a given set of technical requirements, with the minimum number of projects and minimum redundancy. An algorithm issued from robust portfolio modeling is adapted to a vector model, modifying the dominance condition as convenient, in order to find the set of nondominated portfolios, as solutions of a bicriteria integer linear programming problem. In order to improve the former algorithm, a process finding an optimal solution of a monocriteria version of this problem is proposed, which is further used as a first feasible solution aiding to find nondominated solutions more rapidly. Next, a sorting process is applied on the input data or information matrix, which is intended to prune nonfeasible solutions early in the constructive algorithm. Numerical examples show that the optimization and sorting processes both improve computational efficiency of the original algorithm. Their limits are also shown on certain complex instances. © 2014 Javier Pereira et al.