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IB > Vol.1 No.2, December 2009

OPEN ACCESS

Finding the Efficient Frontier for a Mixed Integer Portfolio Choice Problem Using a Multiobjective Algorithm

PDF (Size: 241KB) PP. 99-105 DOI: 10.4236/ib.2009.12013

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ABSTRACT

We propose a computational procedure to find the efficient frontier for the standard Markowitz mean-variance model with discrete variables. The integer constraints limit on the one hand the portfolio to contain a predetermined number of assets and, on the other hand, the proportion of the portfolio held in a given asset. We adapt the multiobjective algorithm NSGA for solving the problem. The algorithm ranks the solutions of each generation in layers based on Pareto non-domination. We have applied the procedure in sixty assets of ATHEX. We have also compared the algorithm with a single genetic algorithm. The computational results indicate that the procedure is promising for this class of problems.

KEYWORDS

Markowitz Model, Multiobjective Optimization, NSGA, Portfolio Selection

Cite this paper

K. ANAGNOSTOPOULOS and G. MAMANIS, "Finding the Efficient Frontier for a Mixed Integer Portfolio Choice Problem Using a Multiobjective Algorithm," *iBusiness*, Vol. 1 No. 2, 2009, pp. 99-105. doi: 10.4236/ib.2009.12013.

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