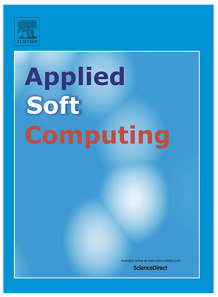
Accepted Manuscript



A fuzzy goal programming model in portfolio selection under competitive-cum-compensatory decision strategies

Mahuya De, B.K. Mangaraj, K.B. Das

PII: S1568-4946(18)30521-0
DOI: https://doi.org/10.1016/j.asoc.2018.09.006
Reference: ASOC 5084

To appear in: *Applied Soft Computing Journal*

Received date : 4 March 2018
Revised date : 27 August 2018
Accepted date : 3 September 2018

Please cite this article as: M. De, et al., A fuzzy goal programming model in portfolio selection under competitive-cum-compensatory decision strategies, *Applied Soft Computing Journal* (2018), https://doi.org/10.1016/j.asoc.2018.09.006

A Fuzzy Goal Programming Model in Portfolio Selection under Competitive-cum-Compensatory Decision Strategies

Mahuya De
Department of Business Administration
Utkal University, Vani-Vihar
Bhubaneswar-751004

B. K. Mangaraj
XLRI-Xavier School of Management
Jamshedpur-831001

K. B. Das
Department of Commerce
Utkal University, Vani-Vihar
Bhubaneswar-751004

Many of the portfolio selection problems involve multiple numbers of conflicting and imprecise criteria in the decision environment. Multi-criteria decision-making approaches using fuzzy logic can tackle such problems when the imprecision is due to fuzziness. There are several fuzzy goal programming models for portfolio selection problems in the literature, either using "Min" or "additive" aggregation operator. While aggregation of decision criteria by "Min" operator stands for a "fully competitive decision strategy", it represents for a "fully compensatory decision strategy" when we use an "additive operator". In this paper, we propose a fuzzy goal programming approach using Werner's "fuzzy and" hybrid operator, which is a combination of "Min", as well as "arithmetic average" to generate efficient frontier. We obtain efficient solutions for different values of $\gamma \in [0, 1]$, the parameter of compensation for the criteria in the decision environment. We consider three criteria, viz. return, risk and liquidity for the purpose. While we use semi-absolute deviation for measuring risk, we utilize piece-wise linear functions to describe fuzzy return and fuzzy liquidity criteria. Taking stocks from three databases based on market capitalization, viz., NIFTY 50, NIFTY Smallcap 100 and NIFTY 500 from the NSE in India. This model demonstrates efficient portfolios for different strategies in a competitive-cum-compensatory decision environment.