Abstract

Market complexity, especially wide range of investing tools and several factors that affect them, makes it hard to make decision on selecting asset kind of investment, and it causes investors face with the problem of optimizing assets in their decisions all time. Optimization problem and determining the efficiency bounder can be solved by mathematical solutions when the total numbers of assets and existent restraints in market are low. But when real world and its conditions are considered the problems cannot be easily solved by math. This paper introduces an innovative method for solving share optimization problem based on different factors of risk and by using artificial colony of honeybee algorithm, and then compares its results with them of genetic algorithm. For this purpose information of four risk factors are collected based on models of Mean-variance Markowitz, semi variance, Mean absolute deviation and mean-variance by considering skewness. In this paper, it is shown that artificial colony of honeybee algorithm can solve all the optimizing models of portfolio by considering factors of Mean-variance, semi variance, Mean absolute deviation and variance-skewness. For showing efficiency of this algorithm, its effectiveness is studied in financial market of Tehran, Tehran Stock Exchange (TSE).
Refer to the following references for the portfolio optimization problem by means of artificial bee colony algorithm, considering various criteria:

- J. Hull, Options, Futures and Other Derivatives, Prentice Hall, New York, 2000
- A. P. Engelbrecht, Fundamentals of computational swarm intelligence, John Wiely & Sons Ltd 2005

**Index Terms**

Computer Science  
Artificial Intelligence

**Keywords**

Portfolio Optimization  
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Artificial Bee Colony Algorithm.
Portfolio Optimization Problem by Means of Artificial Bee Colony Algorithm, Considering Various Criteria