

**Abstract :**

The problem of portfolio selection is one of the most popular areas in Finance. In this work, we will rely on the theory of Harry Markowitz, and the works of Ralph Steuer] for a quad-lin bi-objective mixed integer model. Next, we will propose an exact method for its resolution based on the conjugate gradient, and the cutting efficiency of Chergui et al. as well as new exploration strategy of problems generated in the branches. The proposed algorithm will also be applied to different cardinality constraint conditions, for different market indices.