Abstract

Portfolio optimization is related to the problem of how to determine the proportion of assets to be invested in certain stocks among a number of assets by minimizing the risk for the specified return level. The basic theory of portfolio asset selection by Markowitz in 1952 explained the mean-variance concept where the weight is obtained by optimizing two parameters, the expected return and the variance of return. The mean-variance portfolio may produce poor performance because the value of the expected return and the variance of return is estimated from historical data which may contain errors. In this final project, the implementation of the mean-variance portfolio optimization is carried out in which the two parameters are calculated by considering the uncertainty modeled by the Box Uncertainty Set. Based on the test results with the Sharpe ratio performance measurement and the mean portfolio return, it is known that models under the Box Uncertainty Set produce better performance than models that do not involve uncertainty.

Keywords: portfolio optimization, Box Uncertainty Set, mean-variance portfolio