

Robust Statistics in Portfolio Optimization

Doug Martin¹

¹ Professor of Statistics,
University of Washington
Chief Scientist,
Insightful Corp.

Abstract

In this talk we discuss several applications of robust statistics in portfolio optimization, some of which have been only partially developed or are merely ideas of areas for future work. The primary focal points will be (a) The use of influence functions in connection with optimal portfolio quantities of interest, e.g., global minimum variance and associated mean return, tangency portfolio mean and variance, and Sharpe ratio, and (b) The use of robust covariance matrix and mean vector estimates in Markowitz optimal portfolios, and (c) Robustification of the new conditional value-at-risk (CVaR) portfolio theory due to Rockafellar and Uryasev. A brief tutorial on the CVaR optimality theory will be provided, along with discussion of critical questions related to robustifying this approach.