

Abstract: This thesis is concerned with the robust methods in portfolio theory. Different risk measures used in portfolio management are introduced and the corresponding robust portfolio optimization problems are formulated. The analytical solutions of the robust portfolio optimization problem with the lower partial moments (LPM), value-at-risk (VaR) or conditional value-at-risk (CVaR), as a risk measure, are presented. The application of the worst-case conditional value-at-risk (WCVaR) to robust portfolio management is proposed. This thesis considers WCVaR in the situation where only partial information on the underlying probability distribution is available. The minimization of WCVaR under mixture distribution uncertainty, box uncertainty, and ellipsoidal uncertainty are investigated. Several numerical examples based on real market data are presented to illustrate the proposed approaches and advantage of the robust formulation over the corresponding nominal approach.