Recent developments in robust portfolios with a worst-case approach

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Robust models have a major role in portfolio optimization for resolving the sensitivity issue of the classical mean-variance model. In this paper, we survey developments of worst-case optimization while focusing on approaches for constructing robust portfolios. In addition to the robust formulations for the Markowitz model, we review work on deriving robust counterparts for value-at-risk and conditional value-at-risk problems as well as methods for combining uncertainty in factor models. Recent findings on properties of robust portfolios are introduced and we conclude by presenting our thoughts on future research directions.

Keywords: mean-variance model, robust portfolio, worst-case optimization, uncertainty sets

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