A Multiple Objective View on
Robust Optimization and Stochastic Programming

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Many real world optimization problems are contaminated with uncertain data. We consider problems with a finite set of scenarios and link different models from robust optimization and from stochastic programming through the formulation of a deterministic multiple objective counterpart. Different robustness concepts and stochastic programming can then be interpreted as special cases of a nonlinear scalarization of this multiple objective counterpart problem, if the involved parameters are chosen appropriately. This forms the basis for an analysis of the interrelations and also the differences between established concepts in robust optimization and stochastic programming. By providing additional trade-off information between alternative efficient solutions, the multiple objective counterpart can facilitate the decision making process when deciding for a most preferred robust solution.