

Optimization Problems with Stochastic Dominance Constraints

Abstract. Optimization problems will be discussed that involve stochastic ordering relations as constraints. Stochastic orders formalize preferences among random outcomes and are widely used in statistics and economics. The most prominent stochastic orders are the first and second order stochastic dominance relations. The stochastic ordering constraints relate performance functionals, depending on our decisions, valued in an appropriate L_p -space, to benchmark random outcomes. Necessary and sufficient conditions of optimality and duality theory for optimization problems with dominance constraints will be presented. The results contribute to the theory of semi-infinite and composite optimization in vector spaces. Optimization models of this type provide a link between various approaches of risk-averse optimization. Our analysis sheds additional light on the theory of expected utility, dual (rank-dependent) utility theory, and the theory of coherent measures of risk. Potential applications of this approach will be outlined.

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Lugar: Seminario de Matemáticas y Estadística