Essential Supremum and Essential Maximum with Respect to a Random Preference Relation

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Abstract

In the first part of the talk we present concepts of supremum and maximum as subsets of a topological space X endowed by preference relations. Several rather general existence theorems are obtained for the case where the preferences are defined by countable semicontinuous multi-utility representations. In the second part we consider partial orders and preference relations "lifted" from a metric separable space X endowed by a random preference relation to the space $L^0(X)$ of X-valued random variables and define the concepts of essential supremum and essential maximum. We provide an example of application of the notion of essential maximum to the problem of the minimal portfolio super-replicating an American-type contingent claim under transaction costs.