On the hierarchical risk-averse control problems for diffusion processes

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内容：In this talk and its associated work (Befekadu et al. [1,2]), we consider a risk-averse control problem for diffusion processes, in which there is a partition of the admissible control strategy into two decision-making groups (namely, the leader and follower decision-makers) with different cost functionals and risk-averse satisfactions. Our approach, based on a hierarchical optimization framework, requires that a certain level of risk-averse satisfaction be achieved for the leader as a priority over that of the follower’s risk-averseness. In particular, we formulate such a risk-averse control problem using coupled forward-backward stochastic differential equations that allow us to introduce a family of time-consistent dynamic convex risk measures, based on backward-semigroup operators, w.r.t. the strategies of the leader and that of the follower. Moreover, under suitable conditions, we establish the existence of optimal risk-averse solutions, in the sense of viscosity solutions, to the associated risk-averse dynamic programming equations. Finally, we remark on the implication of our result in assessing the influence of the leader’s risk-averse satisfaction on the risk-averseness of the follower in relation to the direction of leader-follower information flow.