Kim and Omberg revisited: the duality approach

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Extended Abstract

Kim and Omberg [2] study a problem of expected utility maximization from terminal wealth in a continuous-time market, allowing the Sharpe ratio of the risky asset to follow a mean-reverting process. They address the problem using a stochastic control approach, despite the lack of a verification theorem supporting the uniqueness of their results. We provide a rigorous solution to Kim and Omberg’s problem by using a probabilistic approach based on convex duality. Since the market is not complete, we refer to the very general results by Kramkov and Schachermayer [3, 4]. Other references on convex duality methods both in the complete and incomplete case can be found in [1]. Haugh, Kogan and Wang [1] exploit the dual formulation of the optimal portfolio problem to determine an upper bound on the unknown maximum expected utility in order to evaluate the quality of approximation of the optimal solution. As they observe, explicit solutions are rare in incomplete markets where the opportunity set is stochastic. We thus add to the literature by providing an example where the duality approach succeeds in characterizing explicitly the value function, the optimal solutions to both the primal and the dual problem, and the optimal strategy.

References


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