

Statistics and Data Science Seminar

Optimal Portfolio under Fractional Stochastic Environment

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Abstract: Rough stochastic volatility models have attracted a lot of attention recently, in particular for the linear option pricing problem. In this talk, starting with power utilities, we propose to use a martingale distortion representation of the optimal value function for the nonlinear asset allocation problem in a (non-Markovian) fractional stochastic environment (for all Hurst index $H \in (0, 1)$). We rigorously establish a first order approximation of the optimal value, when the return and volatility of the underlying asset are functions of a stationary slowly varying fractional Ornstein-Uhlenbeck process. We prove that this approximation can be also generated by the zeroth order trading strategy providing an explicit strategy which is asymptotically optimal in all admissible controls. Furthermore, we extend the discussion to general utility functions, and obtain the asymptotic optimality of this strategy in a specific family of admissible strategies. If time permits, we will also discuss the problem under fast mean-reverting fractional stochastic environment. Joint work with Ruimeng Hu (UCSB).

Wednesday, April 18 at 3:00 PM in SEO 636