Optimal Portfolios for Financial Markets with Wishart Volatility

Zejing Li

Institute of Stochastics, Karlsruhe Institute of Technology

We consider a multi asset financial market with stochastic volatility modeled by a Wishart process. This is an extension of the one-dimensional Heston model. Within this framework we study the problem of maximizing the expected utility of terminal wealth for power and logarithmic utility. We apply the usual stochastic control approach and obtain explicitly the optimal portfolio strategy and the value function in some parameter settings. In particular when the drift of the assets is a linear function of the volatility matrix. In this case the affine structure of the model can be exploited. In some cases we obtain a Feynman-Kac representation of the candidate value function. Though the approach we use is quite standard, the hard part is indeed to identify when the solution of the HJB equation is finite. This involves a couple of matrix analytic arguments. In a numerical study we discuss the influence of the investors' risk aversion on the hedging demand.

The talk is based on joint work with N. Bäuerle.