Dynamic Programming Equations for Portfolio Optimization Under Partial Information With Expert Opinions

Ralf Wunderlich

Lehrstuhl Wirtschaftsmathematik, Brandenburg University of Technology Cottbus

This paper investigates optimal portfolio strategies in a market where the drift is driven by an unobserved Markov chain. Information on the state of this chain is obtained from stock prices and expert opinions in the form of signals at random discrete time points. We use stochastic filtering to transform the original problem into an optimization problem under full information where the state variable is the filter for the Markov chain. This problem is studied with dynamic programming techniques and with regularization arguments. Using results from the recent literature we obtain the existence of classical solutions to the dynamic programming equation in a regularized version of the model. From this the optimal strategy in the regularized model is straightforward to compute. We give convergence results which show that this strategy is ε-optimal in the original model.

Numerical results are presented in the companion talk by S. Schütze.