

Anticipative optimal investment by rough dynamic programming

Joint work with Franziska Bielert.

We develop a dynamic programming framework which allows us to explicitly solve an optimal investment problem where a trader in a market with frictions can anticipate an asset's price evolution over a moving time window. The controlled state dynamics are understood as a rough differential equation. We combine the martingale optimality principle with a functional form of Ito's formula to derive a Hamilton-Jacobi-Bellman (HJB) equation for this problem. This HJB equation is formulated in terms of Dupire's functional derivatives and involves a transport equation arising from the anticipativity of the problem.