



Robust Strategies for Optimal Order Execution in the Almgren-Chriss Framework

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Assuming geometric Brownian motion as unaffected price process S^0 , Gatheral & Schied (2011) derived a strategy for optimal order execution that reacts in a sensible manner on market changes but can still be computed in closed form. Here we will investigate the robustness of this strategy with respect to misspecification of the law of S^0 . We prove the surprising result that the strategy remains optimal whenever S^0 is a square-integrable martingale. We then analyze the optimization criterion of Gatheral & Schied (2011) in the case in which S^0 is any square-integrable semimartingale and we give a closed-form solution to this problem. As a corollary, we find an explicit solution to the problem of minimizing the expected liquidation costs when the unaffected price process is a square-integrable semimartingale. The solutions to our problems are found by stochastically solving a finite-fuel control problem without assumptions of Markovianity.

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