Quantitative Finance > Computational Finance

Results on numerics for FBSDE with drivers of quadratic growth

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We consider the problem of numerical approximation for forward-backward stochastic differential equations with drivers of quadratic growth (qgFBSDE). To illustrate the significance of qgFBSDE, we discuss a problem of cross hedging of an insurance related financial derivative using correlated assets. For the convergence of numerical approximation schemes for such systems of stochastic equations, path regularity of the solution processes is instrumental. We present a method based on the truncation of the driver, and explicitly exhibit error estimates as functions of the truncation height. We discuss a reduction method to FBSDE with globally Lipschitz continuous drivers, by using the Cole-Hopf exponential transformation. We finally illustrate our numerical approximation methods by giving simulations for prices and optimal hedges of simple insurance derivatives.

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