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Rate of convergence of an empirical regression method for solving generalized backward stochastic differential equations

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This study focuses on the numerical resolution of backward stochastic differential equations with data dependent on a jump-diffusion process. We propose and analyse a numerical scheme based on iterative regression functions which are approximated by projections on vector spaces of functions, with coefficients evaluated using Monte Carlo simulations. Regarding the error, we derive explicit bounds with respect to the time step, the number of paths simulated and the number of functions: this allows us to optimally adjust the parameters to achieve a given accuracy. We also present numerical tests related to option pricing with differential interest rates and locally risk-minimizing strategies (Föllmer–Schweizer decomposition).

Keywords: backward stochastic differential equations; empirical regressions