

Approximation of BSDE with arbitrarily irregular terminal condition

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Abstract

Motivated by numerical approximation of BSDE with bounded irregular terminal condition, we study the propagation of the regularity in a Picard-type time-discretization scheme for BSDE. We show that the discretized solution becomes more and more regular when going backward in time. Moreover, we establish uniform estimates on its derivatives that are polynomial w.r.t. the number of time steps, and that depend on the terminal function only through its supremum norm.

Keywords: Backward Stochastic Differential Equations, time-discretization, irregular terminal condition, regularity, numerical approximation, rate of convergence