

A Numerical Study of a Parabolic Monge-Ampère Equation in Mathematical Finance

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We propose an iterative finite difference method for solving the initial value problem of the parabolic Monge-Ampère equation, arising from the optimal investment of mathematical finance theory. We investigate the positivity and convex preservation properties of the numerical solution. Convergence results are also given. Numerical experiments demonstrate the efficiency of the algorithm and verify theoretical statements. Comparison results with classical weighted implicit method are also given.