Quantitative Finance > Computational Finance

Comparison of numerical and analytical approximations of the early exercise boundary of the American put option

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In this paper we present qualitative and quantitative comparison of various analytical and numerical approximation methods for calculating a position of the early exercise boundary of the American put option paying zero dividends. First we analyze their asymptotic behavior close to expiration. In the second part of the paper, we introduce a new numerical scheme for computing the entire early exercise boundary. The local iterative numerical scheme is based on a solution to a nonlinear integral equation. We compare numerical results obtained by the new method to those of the projected successive over relaxation method and the analytical approximation formula recently derived by Zhu.

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