Evaluation of Callable Bonds: Finite Difference Methods, Stability and Accuracy

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Abstract

The purpose of this paper is to evaluate numerically the semi–American callable bond by means of finite difference methods. This study implies three results. First, the numerical error is greater for the callable bond price than for the straight bond price, and too large for real applications. Secondly, the numerical accuracy of the callable bond price computed for the relevant range of interest rates depends entirely on the finite difference scheme which is chosen for the boundary points. Thirdly, the boundary scheme which yields the smallest numerical error with respect to the straight bond does not perform best with respect to the callable bond.

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