

Abstract

We provide a practical and robust implementation of the valuation of American put and call options for a sub class of exponentially affine models. The solution is obtained through a Fourier version of the integral decomposition representation of the value of American options. The integral decomposition we primarily use is a slightly reformulated version of the representation in Cheang et al., 2013. We numerically solve the non-linear integral equation for the optimal exercise surface as function of current volatility and time to maturity using a Fourier representation of the integral equation. For the exponentially affine models the optimal exercise surface will be proportional to the the strike level. So we immediately get out the surface for all strikes.

For the models without stochastic volatility we have tested the algorithm for maturities up to several decades and verified that the values converge to the analytically or semi-analytically known values for the perpetual counterparts. The results here is a generalisation of the results we presented in von Sydow et al. (2015).

References

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