Efficient Solutions for Pricing and Hedging IDI Options with Jumps and Stochastic Volatility

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We derive closed-form series representations for option prices on Interest Rate Index with the COS method [1]. This includes European vanilla and digital IDI options. We developed analytical solutions for models with jumps and stochastic volatility which have known characteristic function for the integrated process. In a numerical study, we show that option prices can be accurately and efficiently approximated by truncating their series representations. To the best of authors' knowledge, the price is fastest calculated when compared to any existing numerical pricing method. We also study possible implications in the volatility smile surface.

References

 F. FANG, C. W. OOSTERLEE, A novel pricing method for european options based on fourier-cosine series expansions, SIAM Journal on Scientific Computing 31(2) (2008) 826-848.