




Generalized affine transform on pricing quanto range accrual note ★

Shaoyu Li ^a , Henry H. Huang ^b  , Teng Zhang ^c 

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Highlights

- Propose a generalized affine model to value QFRAN.
- Study pricing and hedging of QFRAN using our proposed affine model.
- QFRAN values and hedge ratios are more sensitive to the stochastic mean in our model.

Abstract

This paper was to price and hedge a quanto floating range accrual note (QFRAN) by an affine term structure model with affine-jump processes. We first generalized the affine transform proposed by Duffie et al. (2000) under both the domestic and foreign risk-neutral measures with a change of measure, which provides a flexible structure to value quanto derivatives. Then, we provided semi-analytic pricing and hedging solutions for QFRAN under a four-factor affine-jump model with the stochastic mean, stochastic volatility, and jumps. The numerical results demonstrated that both the common and local factors significantly affect the value and hedging strategy of QFRAN. Notably, the factor of stochastic mean plays the most important role in either valuation or hedging. This study suggested that ignorance of these factors in a term-structure model will result in significant pricing and hedging errors in QFRAN. In summary, this study provided flexible and easily implementable solutions in valuing quanto derivatives.

JEL classification

G12; G13; C3

Keywords

Affine transform; Affine-jump; Stochastic mean; Stochastic volatility

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