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Pricing American put option on zero-coupon bond under fractional CIR model with transaction cost

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ABSTRACT

The motivation of this study is to evaluate the American put option on zero-coupon bond, when the interest rate model is governed by a fractional CIR (FCIR) interest rate model. Since the existence of fractional Brownian motion, leading to create the arbitrage, we employ the transaction cost for eliminating the arbitrage. We first of all apply the Leland's hedging strategy for a self-financing portfolio that contains an American option and zero-coupon bond and derive a formula for the transaction cost. We perform the least-square Monte Carlo (LSM) method for pricing American option under the proposed interest rate model.

KEYWORDS:

American put option | FCIR interest rate model | Leland's hedging strategy | Zero-coupon bond

MATHEMATICS SUBJECT CLASSIFICATION:

91G30 | 91G20 | 91G60

Related Research Data

Option Pricing and Replication with Transactions Costs
Source: The Journal of Finance
Fractional Brownian Motions, Fractional Noises and Applications
Source: SIAM Review
Arbitrage with Fractional Brownian Motion
Source: Mathematical Finance
Valuing American Options by Simulation: A Simple Least-Squares Approach
Source: Review of Financial Studies
An Algorithmic Introduction to Numerical Simulation of Stochastic Differential Equations
Source: SIAM Review
A Theory of the Term Structure of Interest Rates
Source: Econometrica
On Leland's strategy of option pricing with transactions costs
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