

1015-60-273

Ruihua Liu* (ruihua.liu@notes.udayton.edu), Department of Mathematics, University of Dayton, 300 College Park, Dayton, OH 45469, and **Qing Zhang** and **George Yin**. *Option Pricing in a Regime Switching Model Using the Fast Fourier Transform.*

This paper develops a Fast Fourier Transform (FFT) approach to option valuation where the underlying asset price is governed by a regime-switching Geometric Brownian Motion (GBM) model. By adopting the FFT technique introduced in Carr and Madan, a FFT method for the regime-switching model is developed. Aiming at reducing computational complexity, a near-optimal FFT scheme is proposed when the modulating jump process has a large state space. Our approach is a two-time-scale method. A limit price process with reduced state space and the associated option pricing formula are derived. The Fourier transform of the original option values converges to the Fourier transform of the limit option values as the time-scale parameter approaches to zero, which in turn implies the convergence of the option values. As a result, the FFT to the limit problem can be used to approximate the true option values. The computation time required is significantly reduced. Numerical experiments using FFT and near-optimal FFT are carried out and results are reported and compared. (Received February 07, 2006)