

Author's Accepted Manuscript

An analytical approximation formula for European option pricing under a new stochastic volatility model with regime-switching

Xin-Jiang HE, Song-Ping ZHU



PII: S0165-1889(16)30133-6
DOI: <http://dx.doi.org/10.1016/j.jedc.2016.08.002>
Reference: DYNCON3337

To appear in: *Journal of Economic Dynamics and Control*

Received date: 15 April 2016
Revised date: 4 August 2016
Accepted date: 19 August 2016

Cite this article as: Xin-Jiang HE and Song-Ping ZHU, An analytical approximation formula for European option pricing under a new stochastic volatility model with regime-switching, *Journal of Economic Dynamics and Control*, <http://dx.doi.org/10.1016/j.jedc.2016.08.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and a review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

An analytical approximation formula for European option pricing under a new stochastic volatility model with regime-switching

Xin-Jiang HE ^{*} Song-Ping ZHU [†]

Abstract

In this paper, an analytical approximation formula for pricing European options is obtained under a newly proposed hybrid model with the volatility of volatility in the Heston model following a Markov chain, the adoption of which is motivated by the empirical evidence of the existence of regime-switching in real markets. We first derive the coupled PDE (partial differential equation) system that governs the European option price, which is solved with the perturbation method. It should be noted that the newly derived formula is fast and easy to implement with only normal distribution function involved, and numerical experiments confirm that our formula could provide quite accurate option prices, especially for relatively short-tenor ones. Finally, empirical studies are carried out to show the superiority of our model based on S&P 500 returns and options with the time to expiry less than one month.

AMS(MOS) subject classification.

Keywords. European option, Regime-switching Heston model, Perturbation method, Empirical studies.

^{*}School of Mathematics and Applied Statistics, University of Wollongong NSW 2522, Australia

[†]Corresponding author. School of Mathematics and Applied Statistics, University of Wollongong NSW 2522, Australia.

Download English Version:

<https://daneshyari.com/en/article/5098062>

Download Persian Version:

<https://daneshyari.com/article/5098062>

[Daneshyari.com](https://daneshyari.com)