Pricing external barrier option under a stochastic volatility model

Donghyun KIM\(^1\), Ji-Hun YOON\(^1\) and Chang-Rae PARK\(^2\)

1) Department of Mathematics, Pusan National University, Busan 46241, KOREA
2) Investment & Financial Engineering Department, Korea Investment & Securities Co., Ltd., Seoul 07321, KOREA

Corresponding Author: Ji-Hun YOON, yssci99@pusan.ac.kr

ABSTRACT

An external barrier option has a random variable which determines whether the option is knock-in or out. In this paper, by applying the double Mellin transform and the method of images, we derive the corrected option price using asymptotic analysis and explicit solution for external barrier option under a stochastic volatility model incorporated by a fast mean reverting process. Next, for numerical experiments, we verify the price accuracy of the external barrier options with stochastic volatility model between the approximated option price and the option price obtained by Monte-Carlo simulation. Furthermore, we investigate the behavior and sensitivity of the option prices with respect to model parameters.

REFERENCES