Use a reduced Heston or reduce the use of Heston?

Florence Guillaume*
Wim Schoutens†

January 12, 2010

Abstract

This paper features the calibration performance of the Heston model for two different calibration procedures. The first consists of the standard calibration on the whole parameter set and the second one, called reduced calibration consists of a calibration on the reduced parameter set \( \{ \kappa, \lambda, \rho \} \) where the spot variance \( v_0 \) and the long run variance \( \eta \) are inferred beforehand from the time series of the VIX volatility index. It is shown that both calibration procedures lead to an accurate fit of the vanilla option surface. Furthermore both the computation time and the calibration risk of the reduced calibration procedure turns out to be significantly lower, which might turn out to be a considerable advantage for practitioners. This paper also features a comparison of the price of different exotic options for the two calibration procedures.

* T.U.Eindhoven, Department of Mathematics, Eurandom, P.O.Box 513 5600 MB Eindhoven, the Netherlands. E-mail: guillaume@eurandom.tue.nl
† K.U.Leuven, Department of Mathematics, Celestijnenlaan 200 B, B-3001 Leuven, Belgium. E-mail: Wim@Schoutens.be