Goodness-Of-Fit Test for Stochastic Volatility Models

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Abstract

In this paper, we propose a goodness of fit test for continuous time stochastic volatility models based on discretely sampled observations. The proposed test is constructed by measuring deviations between the empirical and true characteristic functions obtained from the hypothesized stochastic volatility model. In this study, both the test statistics based on the fixed and decreasing sampling schemes are taken into consideration. It is shown that under the null, the proposed tests asymptotically follow a weighted sum of products of centered normal random variables. In order to evaluate the proposed tests, a simulation study is performed, in which a bootstrap method is also considered. Finally, a real data analysis is conducted for illustration.

Keywords: Bootstrap; Empirical characteristic function; Goodness-of-fit; Stochastic volatility models; V-statistics.