Application of Heston model and its solution to German DAX data

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We concentrate on the stock price dynamics described by the Heston model [1] and apply the model to the German tick-by-tick DAX data [2]. The data are from May 1996 to December 2001.

Mainly we compare the long time solution developed by [3] with the DAX data and with numerical simulations of the Heston model. Therefore we use the probability density distributions of the logarithmic returns, calculated out of the data, and fit these distributions with the theoretical distribution. In agreement with [3] we exhibit, that the standard solution describes the empirical data, also for lower times t.

In addition we calculate the first and second moment of the probability density distribution of the variance integrated over the time t. And finally we compare the Heston model with the Hull-White model as another example of the models with stochastic volatility [4].

References

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[4] Miccichè, S, Bonanno, G, Lillo, F, and Mantegna, R N 2002 *arXiv:cond-mat/0202527*