Improving the Delta-hedging risk-adjusted performance: the standard VG volatility space model

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Abstract

This paper provides a comparison of the Delta-hedging strategy under the Black-Scholes model and under a particular VG space volatility model, the so-called standard VG space model. This model is obtained by replacing the standard Normal distribution by the symmetric VG distribution with a parameter $\nu$ equal to 1. In particular, this paper focuses on the performance of the P&L of liquid vanilla options written on two major indices quoted on the US market: the Dow Jones and the S&P500. In a first time we look at the optimal historical VG space model by considering one of the most straightforward simple risk measure: the P&L variance. We then compare the P&L variance evolution through time under the Black-Scholes model and the standard VG space model for options traded on a monthly basis from the 4th of January 1999 on. Finally, we compare different performance measures and acceptability indices for the P&L of liquid in-the-money vanilla options, i.e. for writing the option, hedging the position on a daily basis and paying out the option payoff at maturity, focusing therefore on the typical hedging strategy adopted by financial institutions.

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