Smile Effect in a Stochastic Volatility Model Applied to Vale PNA Call Options

Rafael Aguilera Mazzei
Department of Statistics, IME-USP

Abstract

The classical Black-Scholes model assumes that the volatility of the underlying asset is constant. In general, this condition is violated in market prices prediction. Such a deviation is called smile effect, which is supported by the empirical observation that the implied volatility of a number of options with the same maturity and different strike prices displays an U-shape form usually. Many authors prefer to use models where the volatility has a stochastic dynamics. Following this approach, we apply the Hull-White model to get the smile effect generated by Vale PNA call options. We will discuss the results of our analysis.

Keywords: Black-Scholes model, implied volatility, smile effect stochastic volatility.