

A comparative study of hedge performance robustness for equity index models

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The subject of this paper is a comparative empirical study of three alternative stochastic models for equity index dynamics: *geometric Brownian motion*; the *modified constant elasticity of variance model*; and a *minimal market model*. Each model is described by a single parameter family of stochastic differential equations, and each admits an option pricing formula where the parameter appears as a free variable. Using historical data, we simulate the hedge portfolios arising from the three models in question, for European call options on the S&P500 index. For each simulation the model parameters are chosen to optimize the cost of hedging an at-the-money call over the simulation period. We examine the robustness of hedge performance with respect to option strike and maturity. This analysis is applied to the problem of determining which model best fits S&P500 index data.