

Understanding index option returns

Mark Nathan Broadie
Columbia University

Joint work with: M Chernov and M Johannes

Columbia-Polytechnique Conference on
NEW DIRECTIONS IN QUANTITATIVE FINANCE
Paris, May 19–21 2008

Abstract

Previous research concludes that options are mispriced based on the high average returns, CAPM alphas, and Sharpe ratios of various put selling strategies. One criticism of these conclusions is that these benchmarks are ill-suited to handle the extreme statistical nature of option returns generated by nonlinear payoffs. We propose an alternative way to evaluate statistical significance of option returns by comparing historical statistics to those generated by well-accepted option pricing models. The most puzzling finding in the existing literature, the large returns to writing out-of-the-money puts, are not inconsistent (i.e., are statistically insignificant) relative to the Black-Scholes model or the Heston stochastic volatility model due to the extreme sampling uncertainty associated with put returns. This sampling problem can largely be alleviated by analyzing market-neutral portfolios such as straddles or delta-hedged returns. The returns on these portfolios can be explained by jump risk premia and estimation risk.