

Option Pricing with Selfsimilar Additive Processes

The use of time-inhomogeneous additive processes in option pricing has become increasingly popular in recent years due to the ability of these models to adequately price across both strike and maturity with relatively few parameters. In this study we use the property of selfsimilarity to construct two classes of models whose time one distributions agree with those of prespecified Lévy processes. The pricing errors of these models are assessed for the case of Standard and Poor's 500 index options from the year 2005. We find that both classes of models show dramatic improvement in pricing error over their associated Lévy processes. Furthermore, with regard to the average of the pricing errors over the quote dates studied, one such model yields a mean pricing error significantly less than that implied by the bid-ask spreads of the options, and also significantly less than those given by the less parsimonious Lévy stochastic volatility models.