

1107-41-45

Nguyet T Nguyen*, Department of Mathematics & Statistics, Youngstown State University, Youngstown, OH 44555. *Using Gradient Descent to Calibrate Parameters for Variance Gamma Model.*

In this talk I will introduce Variance Gamma Model (VG) for pricing European call options and apply the gradient descent method to calibrate parameters for the model. Suppose we need to calibrate a vector of VG's parameters, $\xi = (\sigma, \theta, \nu)$, from N option prices for different strikes $\{K_i, i = 1, 2, \dots, N\}$, of a stock. Let C_i^{Market} be the market price of the option for strike K_i , and $C_{i,\xi}^{Model}$ be its price calculated by the model. I use the non-linear least squares object function

$$f(\xi) = \sum_{i=1}^N (C_{i,\xi}^{Model} - C_i^{Market})^2.$$

The purpose is to find the vector of parameters ξ such that the model calculated prices, $C_{i,\xi}^{Model}$, are close to the market prices, C_i^{Market} , $i = 1, 2, \dots, N$. The parameter calibration problem becomes the unconstrained optimization problem: finding the minimizer ξ of the objective function $f(\xi)$. (Received December 11, 2014)