

SERGEY GELMAN

Continuous time option pricing with scheduled jumps in the underlying asset

Abstract

This paper introduces a new model of continuous time option pricing, which explicitly accounts for scheduled jumps caused by quarterly earnings announcements in the underlying stock. We present the stock price process as the product of a geometric brownian motion and scheduled jump process with a uniform jump size.

This simple specification allows for obtaining a closed-form analytical solution for the European call option price. Empirical tests using a vast number of options with different strikes and maturities on several US stocks during 1999-2008 show significant superiority of our model over Black-Scholes in terms of fitting option prices. Moreover, the suggested model turns out to be no less precise as the Merton (1976) model with unscheduled jumps. Considering the parsimony and computational simplicity of our model compared to Merton (1976), we deem it preferable for application in the pricing of options on individual securities.