ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

16. Applications

1991 MS Classification: 90, 49, 45, 35
Levendorskiǐ, S. Z., and Boyarchenko, S. I, Rostov State Academy of Economics, Russia

Generalizations of the Black-Scholes formula For a Class of Truncated Lévy Processes

Linear and non-linear analogues of the Black-Scholes equation are derived when shocks can be described by a truncated Lévy process. It is shown that for a family of truncated Lévy distributions, the perfect hedging is impossible even in the continuous time limit.
The equations and solutions can be written in a discretized approximate form which uses an observed probability distribution only.
Assuming that a linear generalization of the Black-Scholes equation holds, explicit pricing formulas for the perpetual American put option are derived and numerical results are produced which show that the difference between the result obtained and the classical Merton's formula for gaussian processes can be substantial. A discretized version uses an observed distribution density, under very weak assumptions on the latter.