Premarathna, L.P.N.D
Karunathilaka N.G.A.
PAPER

Finite Difference Approximation for Valuation of Option Prices with Dividend Payments of the Underlying Assets

L.P.N.D. Premarathna & N.G.A. Karunathilaka Department of Mathematics, University of Kelaniya

The development and the expansion of financial derivatives can be considered as the most significant events in finance during the past decade. The main purposes of the derivatives are hedging or providing risk reduction, arbitrage, and speculation. In the 1970s, Black, Scholes, and Merton developed the Black-Scholes partial differential equation considering the no-arbitrage principle for pricing financial derivatives. However, the efficient computation of prices and hedges for derivative products is a major concern for financial institutions since various assumptions and simplifications have to be made in order to obtain an analytical solution of the Black-Sholes equation. Hence, the resulting analytical solution does not reflect the reality. The remedy consists of discretization of the Black- Scholes equations using some numerical technique in order to obtain an approximate solution. Throughout this work, we present some Finite Difference Methods for solving the Black- Scholes model with dividend payments and discuss their convergence properties.

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