AN OPERATOR SPLITTING METHOD FOR PRICING THE ELS OPTION

Sung-Ki KIM, In-Suk WEE, Darae JEONG and Junseok KIM

1) Department of Mathematics, Korea University, Seoul 136-713, KOREA

Corresponding Author: Junseok KIM, cfdkim@korea.ac.kr

ABSTRACT

This research presents the numerical valuation of the two-asset step-down equity-linked securities (ELS) option by using the operator-splitting method (OSM). The ELS is one of the most popular financial options. The value of ELS option can be modeled by a modified Black-Scholes partial differential equation. However, regardless of whether there is a closedform solution, it is difficult and not efficient to evaluate the solution because such a solution would be represented by multiple integrations. Thus, a fast and accurate numerical algorithm is needed to value the price of the ELS option. This research uses a finite difference method to discretize the governing equation and applies the OSM to solve the resulting discrete equations. The OSM is very robust and accurate in evaluating finite difference discretizations. We provide a detailed numerical algorithm and computational results showing the performance of the method for two underlying asset option pricing problems such as stepdown ELS.

REFERENCES


