Numerical solution of Black-Scholes option pricing with variable yield discrete dividend payment

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ABSTRACT

This paper deals with the construction of numerical solution of the Black-Scholes (B-S)type equation modeling option pricing with variable yield discrete dividend payment at time t_d. Firstly the shifted delta generalized function $\delta(t-t_d)$ appearing in the B-S equation is approximated by an appropriated sequence of nice ordinary functions. Then a semidiscretization technique applied on the underlying asset is used to construct a numerical solution. The limit of this numerical solution is independent of the considered sequence of the nice type. Illustrative examples including the comparison with the exact solution recently given in [1] for the case of constant yield discrete dividend payment are presented.

References

[1] Company R., González A. L., Jódar L. *Numerical solution of modified Black-Scholes equation pricing stock options with discrete dividend*, Mathematical and Computer Modelling, 44, pp. 1058–1068, 2006.