The Time-Discrete Method of Lines for Options and Bonds:A PDE Approach

Gunter H Meyer
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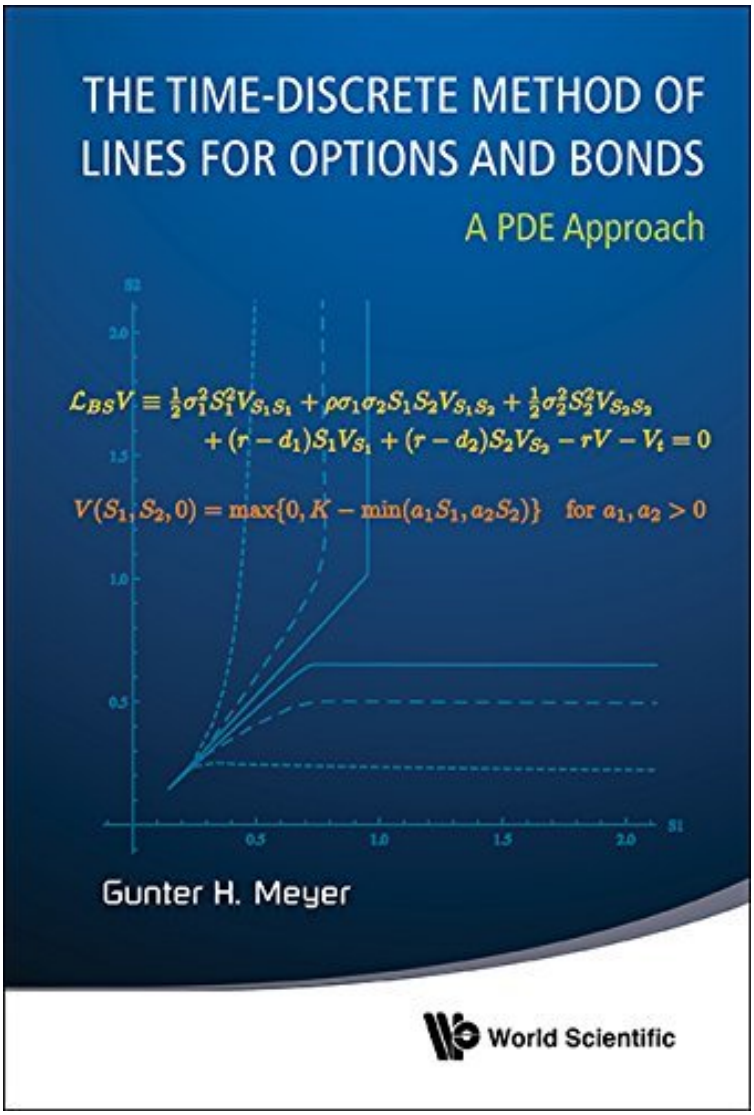

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Gunter H Meyer : The Time-Discrete Method of Lines for Options and Bonds:A PDE Approach before purchasing it in order to gage whether or not it would be worth my time, and all praised The Time-Discrete Method of Lines for Options and Bonds:A PDE Approach:

Few financial mathematical books have discussed mathematically acceptable boundary conditions for the degenerate diffusion equations in finance. In The Time-Discrete Method of Lines for Options and Bonds, Gunter H Meyer

examines PDE models for financial derivatives and shows where the Fichera theory requires the pricing equation at degenerate boundary points, and what modifications of it lead to acceptable tangential boundary conditions at non-degenerate points on computational boundaries when no financial data are available.Extensive numerical simulations are carried out with the method of lines to examine the influence of the finite computational domain and of the chosen boundary conditions on option and bond prices in one and two dimensions, reflecting multiple assets, stochastic volatility, jump diffusion and uncertain parameters. Special emphasis is given to early exercise boundaries, prices and their derivatives near expiration. Detailed graphs and tables are included which may serve as benchmark data for solutions found with competing numerical methods.

From the Inside FlapFew financial mathematical books have discussed mathematically acceptable boundary conditions for the degenerate diffusion equations in finance. In The Time-Discrete Method of Lines for Options and Bonds, Gunter H Meyer examines PDE models for financial derivatives and shows where the Fichera theory requires the pricing equation at degenerate boundary points, and what modifications of it lead to acceptable tangential boundary conditions at non-degenerate points on computational boundaries when no financial data are available. Extensive numerical simulations are carried out with the method of lines to examine the influence of the finite computational domain and of the chosen boundary conditions on option and bond prices in one and two dimensions, reflecting multiple assets, stochastic volatility, jump diffusion and uncertain parameters. Special emphasis is given to early exercise boundaries, prices and their derivatives near expiration. Detailed graphs and tables are included which may serve as benchmark data for solutions found with competing numerical methods.About the AuthorGunter Meyer is Professor Emeritus of Mathematics at the Georgia Institute of Technology in Atlanta, where he helped develop and taught in the MS program in quantitative and computational finance. His research interests focus on numerical methods for partial differential equations and free boundary problems in finance.