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	Autore	Brandimarte Paolo
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	Nota di contenuto	Numerical Methods in Finance and Economics: A MATLAB-Based Introduction; Contents; Preface to the Second Edition; From the Preface to the First Edition; Part I Background; 1 Motivation; 1.1 Need for numerical methods; 1.2 Need for numerical computing environments: why MATLAB?; 1.3 Need for theory; For further reading; References; 2 Financial Theory; 2.1 Modeling uncertainty; 2.2 Basic financial assets and related issues; 2.2.1 Bonds; 2.2.2 Stocks; 2.2.3 Derivatives; 2.2.4 Asset pricing, portfolio optimization, and risk management 2.3 Fixed-income securities: analysis and portfolio immunization2.3.1 Basic theory of interest rates: compounding and present value; 2.3.2 Basic pricing of fixed-income securities; 2.3.3 Interest rate sensitivity and bond portfolio immunization; 2.3.4 MATLAB functions to deal with fixed-income securities; 2.3.5 Critique; 2.4 Stock portfolio optimization; 2.4.1 Utility theory; 2.4.2 Mean-variance portfolio optimization; 2.4.3 MATLAB functions to deal with mean-variance portfolio optimization; 2.4.4 Critical remarks; 2.4.5 Alternative risk

measures: Value at Risk and quantile-based measures

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2.7.3 Lookback options2.8 An outlook on interest-rate derivatives; 2.8.1 Modeling interest-rate dynamics; 2.8.2 Incomplete markets and the market price of risk; For further reading; References; Part II Numerical Methods; 3 Basics of Numerical Analysis; 3.1 Nature of numerical computation; 3.1.1 Number representation, rounding, and truncation; 3.1.2 Error propagation, conditioning, and instability; 3.1.3 Order of convergence and computational complexity; 3.2 Solving systems of linear equations; 3.2.1 Vector and matrix norms; 3.2.2 Condition number for a matrix

3.2.3 Direct methods for solving systems of linear equations3.2.4 Tridiagonal matrices; 3.2.5 Iterative methods for solving systems of linear equations; 3.3 Function approximation and interpolation; 3.3.1 Ad hoc approximation; 3.3.2 Elementary polynomial interpolation; 3.3.3 Interpolation by cubic splines; 3.3.4 Theory of function approximation by least squares; 3.4 Solving non-linear equations; 3.4.1 Bisection method; 3.4.2 Newton's method; 3.4.3 Optimization-based solution of non-linear equations; 3.4.4 Putting two things together: solving a functional equation by a collocation method 3.4.5 Homotopy continuation methods

Sommario/riassunto	A state-of-the-art introduction to the powerful mathematical and statistical tools used in the field of financeThe use of mathematical models and numerical techniques is a practice employed by a growing number of applied mathematicians working on applications in finance. Reflecting this development, Numerical Methods in Finance and Economics: A MATLAB?-Based Introduction, Second Edition bridges the gap between financial theory and computational practice while showing readers how to utilize MATLAB?--the powerful numerical computing environment--for financial applications.The aut