Buff

Uncertain Volatility Models

Theory and Application

Many introductory books on mathematical finance also outline some com puter algorithms. My goal is to contribute a closer look at algorithmic issues that arise from complex forms of the underlying pricing models-issues many practitioners need to solve sooner or later in their careers. This book takes such a close look at uncertain volatility models, an exten sion of Black-Scholes theory.It discusses applications to exotic option portfo lios with barriers and early exercise features. It describes an object-oriented C++ solution, included in source code on the accompanying CD. Practitioners and students who need to build analytic software libraries may benefit from reading this book and studying the software. The book focuses on a family of mathematical models, while in the field one encounters greater variation in instrument properties. In both cases mathematical and financial knowledge must be complemented by good programming skills to produce the best system. Analytic software needs design-a central message of the later chapters of this book. This book has come out of my Ph.D. thesis. I am very grateful to my academic advisor, Marco Avellaneda of New York University, who taught me mathematical finance and uncertain volatility. Computational finance be came exciting for me because Marco encouraged an algorithmic approach to uncertain volatility. I thank Afshin Bayrooti, Vladimir Finkelstein, and Antonio Paras for giving valuable feedback. Antonio is the co-inventor of the original uncertain volatility model, A-UVM. Richard Holmes has found a crucial bug in an early implementation of the software.

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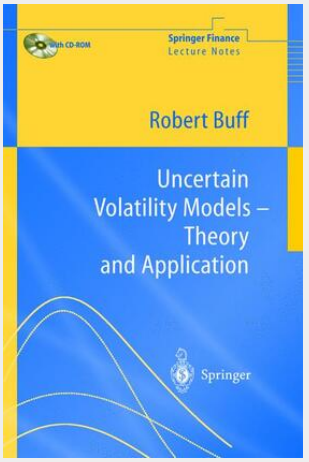

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