

Preface

The title of this volume “Advanced Mathematical Methods for Finance,” AMaMeF for short, originates from the European network of the European Science Foundation with the same name that started its activity in 2005. The goals of its program have been the development and the use of advanced mathematical tools for finance, from theory to practice.

This book was born in the same spirit of the program. It presents innovations in the mathematical methods in various research areas representing the broad spectrum of AMaMeF itself. It covers the mathematical foundations of financial analysis, numerical methods, and the modeling of risk. The topics selected include measures of risk, credit contagion, insider trading, information in finance, stochastic control and its applications to portfolio choices and liquidation, models of liquidity, pricing, and hedging. The models presented are based on the use of Brownian motion, Lévy processes and jump diffusions. Moreover, fractional Brownian motion and ambit processes are also introduced at various levels. The chosen blending of topics gives a large view of the up-to-date frontiers of the mathematics for finance. This volume represents the joint work of European experts in the various fields and linked to the program AMaMeF.

After five years of activity, AMaMeF has reached many of its goals, among which the creation and enhancement of the relationships among European research teams in the sixteen participating countries: Austria, Belgium, Denmark, Finland, France, Germany, Italy, The Netherlands, Norway, Poland, Romania, Slovenia, Sweden, Switzerland, Turkey, and United Kingdom.

We are grateful to all the researchers and practitioners in the financial industry for their valuable input to the program and for having participated to the proposed activities, either conferences, or workshops, or exchange research visits these may have been. We are also grateful to Carole Mabrouk for her administrative assistance.

It was an honor to be chairing this program during these years and to have worked together with an engaged team as the AMaMeF Steering Committee, whose members, in addition to ourselves, have been (in alphabetic order): Ole Barndorff-Nielsen, Tomas Björk, Vasili Brinzanescu, Mark Davis, Arnoldo Frigessi, Lane Hughston, Hayri Körezlioglu, Claudia Klüppelberg, Damien Lambertson, Marco

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Giulia Di Nunno
Bernt Øksendal



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Di Nunno, G.; Øksendal, B. (Eds.)

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