

WILEY FINANCE

Companion Website

# A Workout in Computational Finance

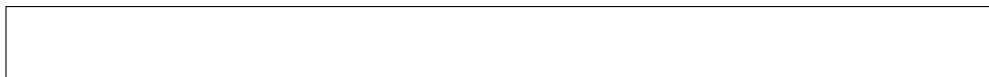
Michael Aichinger  
Andreas Binder



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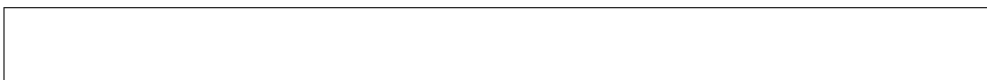
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# Introduction and Reading Guide

## PROLOGUE

We wrote this book with the aim of giving practitioners in computational finance a sound overview of relevant numerical methods. Some of the methods presented in this book are widely used today, while others should, in our opinion, gain more importance in the future. By, “computational finance” we loosely refer to all tasks related to the valuation of financial instruments, risk analysis and some aspects of risk management. Together with our colleagues at MathConsult GmbH, we have been working on a wide range of computational finance projects since 1997. During that time, we have observed that the numerical quality of software used in financial institutions widely varies.

Particular attention is thus given to working out the strengths and weaknesses of the different methods, and to reveal possible traps in their application. We have used real-world examples of valuation, risk analysis and calibration of specific financial instruments and models to introduce each method. A strong emphasis is laid on stable and robust schemes for the numerical treatment.

We have named the book “A Workout in Computational Finance” because due to our experience in training finance professionals, it is our strong belief that computational methods are best studied in a practical, hands-on approach, requiring the student to write at least part of the program code herself. To facilitate this style of learning, the book comes with accompanying software distilled from the UnRisk software package.<sup>1</sup>

The reader is assumed to have a basic knowledge of mathematical finance and financial derivatives, and a strong interest in quantitative methods. The typical reader of the book is a “junior quant” at a financial institution who wants to gain deeper insight into numerical methods, or, if she has a background in economy, wants to take first steps towards a more quantitative approach. Alternatively, university students at the graduate level may find the topics in this book useful when deciding on a possible future career in finance.

## WHAT YOU CAN EXPECT FROM THE DIFFERENT CHAPTERS

In the following, we give a short overview of the contents of the different chapters. Together with the reading guide this should allow the reader to select her topics of interest.

### Chapter 2: Binomial Trees

Binomial trees a conceptionally elegant method for valuating derivatives: They are explicit (i.e., no system of equations needs to be solved), and they intrinsically include no-arbitrage

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<sup>1</sup> The UnRisk ENGINE and the UnRisk FACTORY are software packages for valuation and risk management of financial instruments and portfolios thereof. UnRisk has been developed by MathConsult since 1999 and now contains more than 1 million lines of multi language code. UnRisk is a registered trademark of MathConsult. Details: [www.unrisk.com](http://www.unrisk.com)

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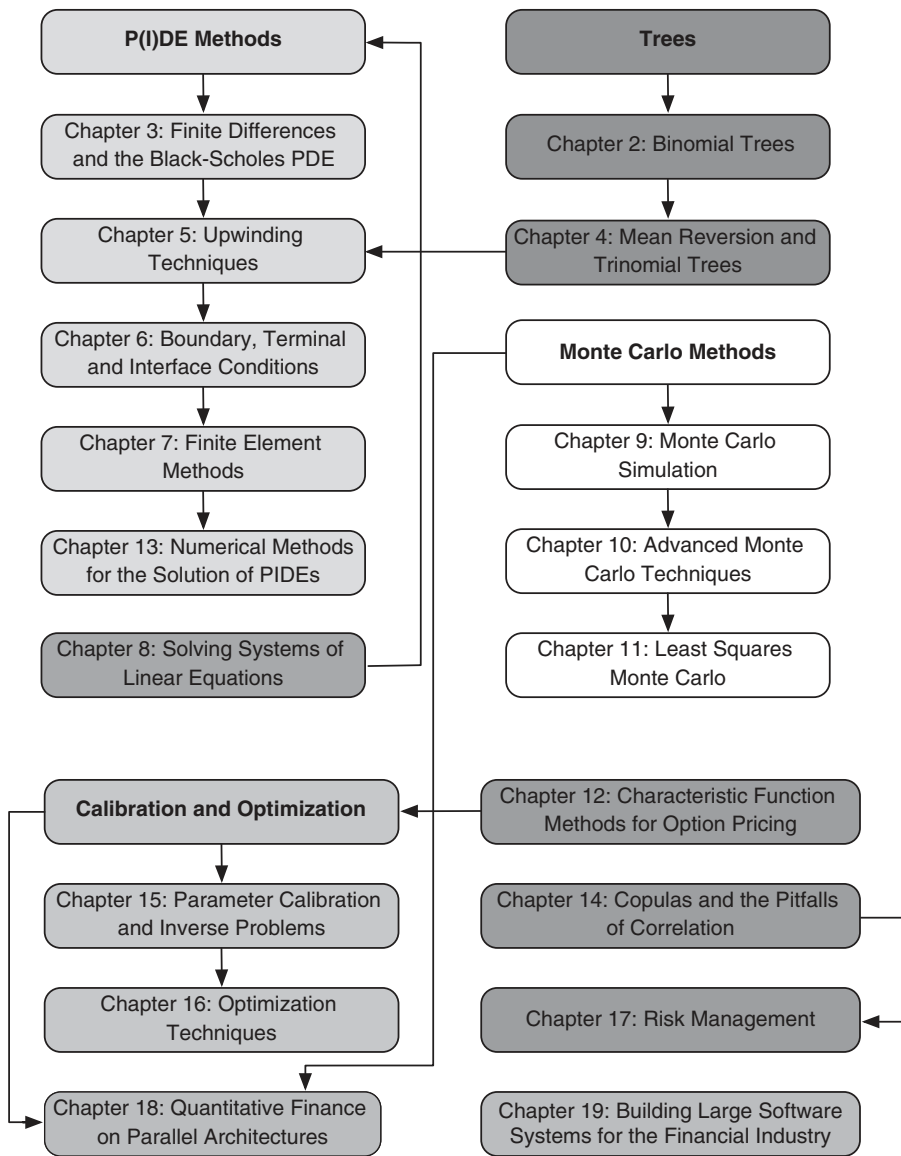
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