

Book Review:^{*} Prisman (2000)

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Eliezer Z. Prisman: “Pricing Derivative Securities, An Interactive Dynamic Environment with Maple V and Matlab”, San Diego, CA: Academic Press, 2000, 754 pages, approx. SFr. 155

This is neither a standard textbook on option pricing nor is it a book on implementing valuation models in Maple and Matlab. The unique feature about this book is that it embeds its coverage of derivative pricing in the Maple toolbox for manipulating mathematical expressions (and Matlab for graphs). No prior knowledge of Maple and Matlab is required, the necessary software can be installed from the accompanying CD. Taken Maple’s capability for symbolic manipulation of mathematical expressions for granted allows the book

and its reader to outsource the business of solving and simplifying equations to the computer while focusing on the economic principles of valuing financial derivatives. The book’s approach to mathematics could almost be dubbed “heuristic” in the sense that this job is left to the computer. This cannot be a substitute for learning and exercising mathematical tools, but from an applied perspective it might be useful to sidestep some of the technicalities involved in order to build a coherent economic story. What is more, the reader gets an on-the-fly introduction into Maple.

What is noteworthy about the contents of the book is its strict focus on the no-arbitrage principle – be it expressed in a finite-space state-preference framework, an infinite space stochastic discount factor or by risk-neutral probabilities. Otherwise, the topics are fairly standard and similar to the core contents of books like Hull (2000), Wilmott (2000) or Jarrow and

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Turnbull (1999).

The first chapters introduce the ideas of risk-neutral probabilities and the stochastic discount factor in a finite payoff space setup in complete markets and calculates arbitrage bounds for incomplete markets. A chapter is devoted each for applications to equity derivatives and debt markets in this framework. After a discussion of option fundamentals follows the extension to infinite spaces. It is in the middle of the book where the Black-Scholes formula is derived as a risk-neutral expectation which is followed by a chapter devoted to Greek letters. The last half of the book covers term structure models, forwards and swap valuation, American options and two chapters on binomial models.

Again, the material is pretty standard and the book offers less breadth as for instance Hull (2000) or Wilmott (2000) but there is more focus on basic principles and on playing around with formulas, graphs and numerical evaluations. It is particular the latter aspect where the beauty of the book's approach is borne out. Trying out different values for the finite payoff space is as easy as playing round with formulas and their solutions on the accompanying Maple sheets. Equally handy is the manipulation of graphs (including binomial tree plots) with the Matlab engine. The whole text and all the formulas are embedded in Maple sheets, so that the complete book can be read online. This allows conveniently to try out alternatives be they numerical or symbolic. The CD contains a student version of Maple and a Matlab engine which allow to work with the book's in-

teractive worksheets and to manipulate graphs without having a prior installation of either program.

References

- Hull, John C. 2000. *Options, Futures, and Other Derivatives*. 4th edition. Upper Saddle River, NJ: Prentice Hall.
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- Prisman, Elizer Z. 2000. *Pricing Derivative Securities, An Interactive Dynamic Environment with Maple V and Matlab*. San Diego, CA: Academic Press.
- Wilmott, Paul. 2000. *Paul Wilmott on Quantitative Finance*. Volume I&II. Chichester, UK: John Wiley & Sons Ltd.