



BOOK REVIEW

McNeil, Alexander J., Frey, Rüdiger, and Embrechts, Paul, 2005, *Quantitative Risk Management*, Princeton University Press, Princeton and Oxford, 608 pages, \$79.50, ISBN 0-691-12255-5.

Enterprise risk management has become a hot annual symposium event for actuaries, the fourth held in 2006 (www.ermssymposium.org). *Quantitative Risk Management* (QRM), well written and encyclopedic, is a most timely and welcome guide for researchers and practitioners. The chapter list shows the broad coverage of QRM:

1. Risk in Perspectives
2. Basic Concepts in Risk Management
3. Multivariate Models
4. Financial Time Series
5. Copulas and Dependence
6. Aggregate Risk
7. Extreme Value Theory
8. Credit Risk Management
9. Dynamic Credit Risk Models
10. Operational Risk and Insurance Analytics

Except for the first chapter on case studies and regulatory environments, which sets out a practical overview, each section in the other nine chapters gives the mathematics rigorously and supplements using notes and comments that serve as an annotated bibliography of each subtopic. In presenting the mathematics, the sections move quickly from the basics to the frontiers and often motivate using practical examples. I give two examples for areas familiar to most actuaries. (1) For aggregate loss theory (section 10.2), QRM starts with the Laplace transform of the aggregate and follows with the Panjer recursion and then the tail behavior of the compound sum. (2) For financial time series (Chapter 4), QRM does the usual Box-Jenkins model (Section

4.2) in a flash, and then moves to every mutation of GARCH (Sections 4.3–4.6). While the mathematics is merciless, QRM equips the reader with empirical common sense in a first section of stylized facts (Section 4.1).

There are many examples in all chapters except the first. Most lemmas, propositions, and theorems come with proofs. Diligent readers with pencil and paper to expand out some of the details don't need exercises. For other readers using QRM as a textbook, one may need additional but easier exercises, such as those found in Alexander and Sheedy (2004) or Jorion (2005), the two textbooks for the two risk management credential exams (PRM and FRM).

QRM is well worth its cost if you need only one of its chapters as a survey of a big body of work. Chapter 7, Extreme Value Theory, is a usable executive summary of Embrechts, Klüppelberg, and Mikosch (1997), for instance. You can even receive the book for free: It is part of the package of the Swiss Association of Actuaries International Summer School 2006, www.saa-iss.ch/info.html.

REFERENCES

- ALEXANDER, CAROL, AND ELIZABETH SHEEDY (EDS.). 2004. *Professional Risk Managers' Handbook*. Wilmington, DE: Professional Risk Managers' International Association.
- EMBRECHTS, PAUL, CLAUDIA KLÜPPELBERG, AND THOMAS MIKOSCH. 1997. *Modeling Extremal Events for Insurance and Finance*. New York: Springer.
- JORION, PHILIPPE. 2005. *Financial Risk Manager Handbook*. New York: Wiley.

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