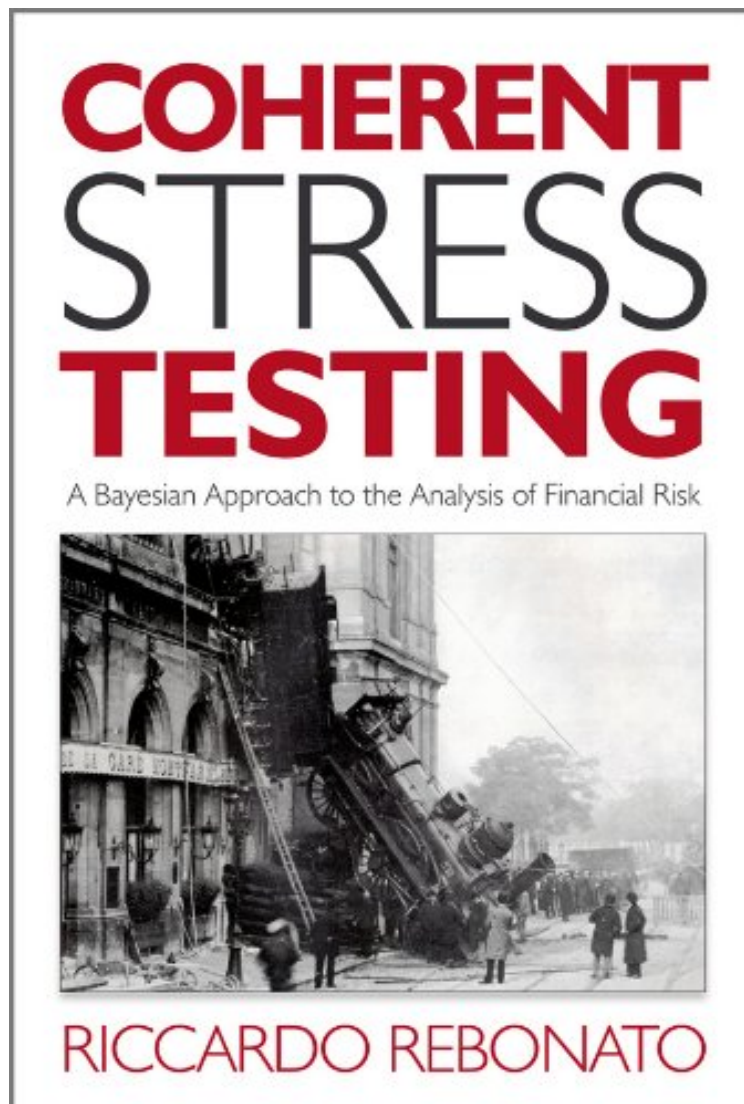


[Online library] Coherent Stress Testing: A Bayesian Approach to the Analysis of Financial Stress (The Wiley Finance Series)

Coherent Stress Testing: A Bayesian Approach to the Analysis of Financial Stress (The Wiley Finance Series)

Riccardo Rebonato

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Riccardo Rebonato : Coherent Stress Testing: A Bayesian Approach to the Analysis of Financial Stress (The Wiley Finance Series) before purchasing it in order to gage whether or not it would be worth my time, and all praised Coherent Stress Testing: A Bayesian Approach to the Analysis of Financial Stress (The Wiley Finance Series):

18 of 21 people found the following review helpful. powerful intuitions, weaker on technical detailsBy S. MatthewsThe intuitive ideas here are original and valuable, but the technical follow-through is weak.The positive side is the idea that you can associate sets of stress scenarios with probabilities using graphical models, and the advantages

of doing this. There are some issues, however. Rebonato does not seem to be aware of whole bodies of theoretical and practical work on normative probabilistic reasoning in machine learning, e.g., on the theoretical side, Koller and Friedman or Wainwright and Jordan to name two, or Heckerman on the practical side. Then there is his idea that you should calibrate your model using linear programming. This is 'algorithmically' sound, but it is not 'principled' - the usual way to calibrate such models is probably by maximum entropy (and max-ent would at least help, if not solve, some of the problems he mentions such as missing marginal probabilities, etc.). True, max-ent is trickier than linear programming, but there is a lot of work on this specific problem that Rebonato does not seem to be aware of. It is interesting that the bibliography is focussed more or less completely on risk and more philosophically oriented Bayesian texts. Serious machine learning texts aren't cited. I am also slightly (but only slightly) sceptical that specifically Bayesian networks are actually the best way to do what Rebonato proposes - true they are great when you can build them: you get both very good formal behaviour, and the huge informal advantage that you can use them to tell causal stories, but a fair bit of the sort of information you might want to incorporate into a risk model might be missing convincing causal structure - all you may have is correlation relations. If this is so, you are going to have to go with Markov random fields (or even hybrid models), which are intuitively, but not really formally that closely related to Bayesian nets (though the fact that Rebonato emphasises discrete probability distributions is definitely a help if you were to move in this direction). Finally, there is the genuinely odd 'roll your own' discussion about linear programming. I've already said that linear programming may not be the best tool here, but this discussion is revealing for other reasons. Rebonato tells us that he built his own first LP solver in Visual Basic (! - in Excel?) and then reimplemented it in C++. To me, this is like building your own drill as part of a project to build a boat (Tim Severn or Thor Heyerdahl might do it, but the rest of us are better advised to head around the local building suppliers and pick up a Bosch powerdrill). I mean, if RBS doesn't have a copy of Matlab lying around, then Octave has a good linear programming solver, and if you need more horsepower, then there are systems that will outperform a homebrew LP solver like a Bosch will outperform a bow drill. In summary, if you were going to use Rebonato's ideas for real, you might want to use something like Koller as your technical foundation, and rely on Rebonato more for big picture and ideas. P.S. [added 26.8.11] And, right on cue, a brochure has landed in my mailbox to tell me that the man himself is presenting a course on his book just down the road (well, 400km down the A8) from me next month, and, indeed, emphasis seems to have shifted from linear programming (which is not mentioned - but presumably is still deployed) to entropy maximisation.

In *Coherent Stress Testing: A Bayesian Approach*, industry expert Riccardo Rebonato presents a groundbreaking new approach to this important but often undervalued part of the risk management toolkit. Based on the author's extensive work, research and presentations in the area, the book fills a gap in quantitative risk management by introducing a new and very intuitively appealing approach to stress testing based on expert judgement and Bayesian networks. It constitutes a radical departure from the traditional statistical methodologies based on Economic Capital or Extreme-Value-Theory approaches. The book is split into four parts. Part I looks at stress testing and at its role in modern risk management. It discusses the distinctions between risk and uncertainty, the different types of probability that are used in risk management today and for which tasks they are best used. Stress testing is positioned as a bridge between the statistical areas where VaR can be effective and the domain of total Keynesian uncertainty. Part II lays down the quantitative foundations for the concepts described in the rest of the book. Part III takes readers through the application of the tools discussed in part II, and introduces two different systematic approaches to obtaining a coherent stress testing output that can satisfy the needs of industry users and regulators. In part IV the author addresses more practical questions such as embedding the suggestions of the book into a viable governance structure.

From the Inside Flap: "Rebonato's refreshingly original book is the most significant advance in financial risk management in many years. It is rigorous yet thoroughly practical, proposing an operational Bayesian framework that complements purely statistical approaches with the causal/economic structure needed for coherent stress testing. Prominently displayed and mixed beautifully throughout are both the expansive wisdom of a serious scholar, and the pragmatic applied sense of a seasoned industry veteran. Rebonato has defined the new frontier of best-practice financial risk management. I am open-mouthed with admiration." — Francis X. Diebold, Paul F. and Warren S. Miller Professor of Economics, Co-Director, Wharton Financial Institutions Center, Professor of Finance and Statistics, University of Pennsylvania "Risk management is at a crossroads. The 'certainty' provided by statistical analysis of historical data has been shown to be an illusion. The challenge is how to inject a dose of judgment but not revert to pure subjectivity. There is no clear answer, and a reliable guide is required to navigate what can be a minefield. Fortunately Dr. Rebonato has used his unique combination of technical skills and experience to explain what cannot be done using stress testing. Anyone who is interested in combining the best aspects of statistical analysis and disciplined subjective judgment should read this book." — Ian Cooper, Professor Finance, London Business School "Wall Street goes Bayesian! These methods have long been used as a standard technique in reliability engineering and operations research, now this book introduces Bayesian nets as a

stress testing tool for the financial industry. Every quantitative risk manager ought to be aware of their potential: this is an excellent start.

— Paul Embrechts, Department of Mathematics and RiskLab, ETH Zurich

Stress tests are essential complements to VaR models, which are inadequate for very rare events. In practice, however, scenarios can be difficult to handle because they are typically not associated with a probability. This book shows how to build subjective, yet consistent probabilities for scenarios. Highly recommended.

— Philippe Jorion, Professor, University of California at Irvine

From the Back Cover

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— Riccardo Renato examines the deficiencies of current financial modelling practice and the limitations of the purely statistical approaches to risk quantification that underpin VaR methodology. Taking his cue from Knightian uncertainty and Rumsfeldian unknown unknowns, the author argues that a program of stress testing carried out within a Bayesian paradigm can offer risk managers a route to redemption after the crisis. Written in his usual lucid and engaging style, *Coherent Stress Testing* is a thought provoking text on a vitally important issue, and a serious proposal of a workable solution.

— Alexander J. McNeil, Maxwell Professor, Heriot-Watt University

— Riccardo Rebonato's book shows how managerial judgments can be combined with analysis to improve the way stress testing is done. The book is well written and very timely. In the aftermath of the 2007–2009 financial crisis risk management groups at all financial institutions are looking for ways they can make stress testing more effective.

— John Hull, Maple Financial Professor of Derivatives and Risk Management, Joseph L. Rotman School of Management, University of Toronto

— Rebonato's interesting book provides a refreshingly different and thought-provoking perspective of stress-testing and quantitative risk management — exactly what the field needs in these troubled times.

— Rüdiger Frey, Professor of Financial Mathematics and Optimization, Universität Leipzig, Co-author of *Quantitative Risk Management: Concepts, Techniques, Tools*

About the Author

DR. RICCARDO REBONATO (London, UK) is Head of Front Office Risk Management and Head of the Clients Analytics team at BGM RBS. He is visiting lecturer at Oxford University (Mathematical Finance) and adjunct professor at Imperial College (Tanaka Business School). He sits on the Board of Directors of ISDA and on the Board of Trustees for GARP. He is an editor for the *International Journal of Theoretical and Applied Finance*, *Applied Mathematical Finance*, *Journal of Risk*, and the *Journal of Risk Management in Financial Institutions*. He holds doctorates in Nuclear Engineering and in Science of Material/Solid State Physics. He was a research fellow in Physics at Corpus Christi College, Oxford, UK.