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Book Review: *Extreme Risk Management: Revolutionary Approaches to Evaluating and Measuring Risk* By Christina Ray

Review by Pierre Tournier

EXTREME RISK MANAGEMENT: REVOLUTIONARY APPROACHES TO EVALUATING AND MEASURING RISK,

by Christina Ray, is a discussion about financial modeling through risk-management-tinted glasses. This book



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provides a readable discussion of model risk as well as a guideline for how models should be built. The intended audience is the professional in the financial industry who relies on models as sources of

actionable data. Readers looking to learn how to build their own causal models will need more detail than this book provides. Ray assumes the reader is familiar with common financial models and statistical concepts, without being a physicist.

The book begins by reviewing the evolution of current financial models, constantly reminding the reader of the assumptions that go into these models and their strengths and weaknesses. The models that Ray describes are statistical and backward-looking, relying less on economic fundamentals and more on data. Ray argues that these models were developed in response to imperfect, coarse or stale data; as financial products become more complex the shortcomings become more glaring. Although Ray details several value at risk (VaR)-like models, this issue applies to all financial models.

The bulk of the book talks about systems and how we model them. As the system (e.g., the financial market) becomes more complex, the models needed to describe them become more complicated. Ray highlights which elements from a system should be considered, using examples from the financial markets to illustrate her point. The AIG creditworthiness/margin call spiral is clearly presented as an example of both causality and feedback loops. This section advocates for causal models; statistical models are all but ignored here.

At times I got frustrated as Ray described what needed to be considered to correctly specify a financial model. Although I agree with Ray that a correctly specified causal model is preferable to a statistical approximation, I find the task daunting. Creating a worthwhile causal model seems nearly impossible given the complexity involved. It wasn't until I reread Ray's book that I realized she is advocating a mix between the two systems. Ray is really describing a framework for how we should approach modeling problems before blindly applying statistical models. She's also providing a guideline for how model results should be interpreted and formalizing the human judgment piece of the decision-making process.

Throughout this section, Ray reminds the reader to consider that the systems we try to model may evolve over time. Examples of this important concept vary from thought-examples on evolution to demonstrations of volatility clustering. This, along with the discussion on the shortcomings of traditional statistical models, is probably the most important point that Ray drives home about model risk.

The last part of this book makes extensive comparisons between models built by the intelligence and financial communities. In this section it sometimes feels like Ray is in favor of a specialist-based approach where experts gather information, and specify the possible outcomes. This is consistent with the causal theme throughout the book.

Ray also advocates for a Network Centric Organization (NCO) over a centralized system for decision making. Using comparisons between modern warfare and a trading desk, Ray makes the point that decentralized decision-making hierarchy can react faster and more efficiently. It also allows for human intelligence and rational decision making. The financial example provided is a group of trading desks within a bank, each with its own limits. The limits may be mandated by a central group, but each desk is free to manage its limits on its own.

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An important omission here is a discussion of human risk as it applies to the delegation of decision making. When describing the advantages of an NCO, Ray does not discuss possible risks such as agency issues. Without comparing the relative risks and rewards, it’s difficult to say that one approach is clearly superior to another.

I enjoyed reading this book and thought it was well worth my time, both as an introduction or refresher to

model risk. I appreciated the theme that systems are fundamentally causal; we use statistical models because we can’t properly specify them. Because Ray assumes the reader is familiar with statistics and risk models (e.g., VaR), the book moves along without getting bogged down in definitions. The discussion thankfully sticks to concepts rather than proofs, which makes for easier reading. In all, it is a very informative and interesting read. ■

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resulting guidance that will be developed by EIOPA, will likely/is expected to bring a welcome sigh of relief from the global insurance industry.

The next several years will be a period of significant regulatory change for the insurance industry globally, with some particular challenges for the U.S. industry depending on the exact outcomes of the NAIC’s proposed changes. Close monitoring of global solvency requirements as well as the specificities of the U.S. regime can be beneficial in the long run to manage the steep learning curve and plan in advance for the sweeping changes to strategy, organization, operations and infrastructure.

LINKS:

SMI Roadmap:

http://www.naic.org/documents/committees_ex_isftf_summer_ntlmtg_meeting_smi_roadmap.pdf

EIOPA’s medium term work plan:

[\[ceiops/WorkInProgress/SolvencyII-Medium-Term-Work-Plan-2011-2014.pdf\]\(http://ceiops/WorkInProgress/SolvencyII-Medium-Term-Work-Plan-2011-2014.pdf\)](https://eiopa.europa.eu/fileadmin/tx_dam/files/about-</p>
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Omnibus II:

http://ec.europa.eu/internal_market/finances/docs/committees/supervision/omnibus2/com2011_en.pdf ■

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