Table of Contents

List of Tables and Figures................................................................................................................ ix
Abstract................................................................................................................................................ x
Zusammenfassung ................................................................................................................................... xiii
Introduction ........................................................................................................................................... 1

Part I: Concepts, Model Level and Risk Assessment................................................................. 21
1. Introduction to Part I.......................................................................................................................... 23
2. Literature Synthesis, Theoretical Background and Research Focus............................................ 25
  2.1. Complexity and Modern Financial Systems............................................................................... 25
  2.2. Risk and Risk Management in the Financial World................................................................. 32
      2.2.1. Risk modeling...................................................................................................................... 37
      2.2.2. Value at Risk (VaR)............................................................................................................. 41
      2.2.3. Expected Shortfall (ES)........................................................................................................ 47
  2.3. Systemic Risk Assessment.......................................................................................................... 49
      2.3.1. Tools primarily for regulators: Conditional Value at Risk (CoVaR) and Systemic Expected Shor tfall (SES).... 51
      2.3.2. Extreme Value Theory (EVT)............................................................................................. 53
  2.4. General Appraisal...................................................................................................................... 55
      2.4.1. Advantages of conventional risk models and measures.................................................. 56
      2.4.2. Weaknesses of conventional risk models and measures................................................. 58
  2.5. Excursus: Benoît Mandelbrot's Plea for Fractal Methods..................................................... 63
3. Research Questions......................................................................................................................... 73
4. On an Adequate Concept of Risk and Systemic Risk in the Realm of Banking........................ 75
  4.1. The Notion of Risk....................................................................................................................... 75
  4.2. The Concept of Systemic Risk................................................................................................... 91
5. On the Relevance of Systemic Risks for Banks........................................................................ 103
  5.1. Why should Banks take account of, and try to deal with, Systemic Risks?.......................... 103
  5.2. What are concrete Systemic Risk Scenarios for Banks?......................................................... 115
6. Dealing with Quantitative Risk Management in Banking as a Complex Systems Problem..... 123
  6.1. A Trichotomy of Scientific Problems – Warren Weaver’s Scheme as a General
      Answer to How to Manage Complexity....................................................................................... 128
      6.1.1. Tackling disorganized complexity versus organized simplicity .................................... 128
      6.1.2. Disorganized complexity and statistical techniques......................................................... 131
      6.1.3. Tackling organized complexity: open questions remain............................................. 134
      6.1.4. Synopsis............................................................................................................................... 136
  6.2. Weaver’s Taxonomy Revisited: Attempts of Clarification, Extension and Refinement........ 139
      6.2.1. Approaches towards the operationalization of Weaver’s concept of organized
              complexity ............................................................................................................................. 139
      6.2.2. The bigger picture of complexity and randomness............................................................ 142
The Fundamental Inadequacy of Probability Theory as a Foundation for Modeling Systemic
Extreme Risk in a Banking Context

15.1. Philosophical Roots of the Problem of Induction: some Preliminaries
15.2. Probability Theory in a Nutshell, its Embeddedness and its Applications
15.3. The Central Argument against using Probability Theory for Financial Risk
Management
15.4. Linking the Central Argument with the Current State of the Literature (IIIa-c)

Conclusion to Part I

Résumé

Part II: The Transition to the Decision Level, Risk Assessment and Management

Introduction to Part II

The Critical Turn: The Renaissance of Practical Wisdom

Scenario Planning in a Nutshell and its Role in Risk Management in Banking

Strengths and Weaknesses of Scenario Planning as a Risk Management Tool

Deriving Lessons for Rethinking the Approach to Assessing Extreme and Systemic Risks

Part III: In Search of a New Paradigm: The Third Way as a Road to Logic-Based Risk Modeling (LBR)

Introduction to Part III

Theoretical Foundations of a Logic-Based Risk Modeling (LBR) Approach

A less Restrictive Axiomatization

Non-Probabilistic Models of Uncertainty

Ranking Theory

Syntax of a Language for Describing Contracts and Correlations

Semantics: Financial Contracts as Uncertain Sequences in a Non-Probabilistic Risk Model Context

Uncertain sequences by example

From contract value to risk

Formalization of the approach

Concrete instantiations of uncertainty monads: ranking functions

Evaluating risk models

Model Interpretation and Output: An Exact, Explanatory Scenario Planning Method

Case Study: LTCM and Extreme Risk

Example Trade

A Fixed Income Portfolio in LBR

Analysis

Overview

Zoom and filter

Details on demand

Discussion and Conclusion
17. Managerial Implications ........................................................................................................... 291
18. Scales of Measurement and Qualitative Probabilities .............................................................. 297
19. Model Validation ...................................................................................................................... 303


20. Introduction to Part IV as Overall Conclusion ........................................................................ 323
22. Final Remarks and a Path for Future Research ...................................................................... 339

References ...................................................................................................................................... 345

List of Appendices .......................................................................................................................... 377

To access the book’s appendix, please visit www.springer.com and search for the author’s name. URL: http://www.springer.com/978-3-658-20032-9
Assessing Risk Assessment
Towards Alternative Risk Measures for Complex
Financial Systems
Hoffmann, C.H.
2017, XIV, 377 p. 36 illus., Softcover