

1. Record Nr.	UNINA9910132287803321
Autore	Cruz Marcelo G.
Titolo	Fundamental aspects of operational risk and insurance analytics [[e-book] ] : a handbook of operational risk / / Marcelo G. Cruz, Gareth W. Peters, Pavel V. Shevchenko
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , 2015 ©2015
ISBN	1-118-57300-5 1-118-57301-3 1-118-57302-1
Descrizione fisica	1 online resource (942 p.)
Collana	Wiley Handbooks in Financial Engineering and Econometrics
Classificazione	MAT029000
Disciplina	658.15/5
Soggetti	Operational risk Risk management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Machine generated contents note: Preface xxi Acronyms xxv 1 OpRisk in Perspective 1 1.1 Brief History 1 1.2 Risk-Based Capital Ratios for Banks 5 1.3 The Basic Indicator and Standardized Approaches for OpRisk 9 1.4 The Advanced Measurement Approach 11 1.5 General Remarks and Book Structure 16 2 OpRisk Data and Governance 17 2.1 Introduction 17 2.2 OpRisk Taxonomy 18 2.3 The Elements of the OpRisk Framework 25 2.4 Business Environment and Internal Control Environment Factors (BEICFs) 29 2.5 External Databases 32 2.6 Scenario Analysis 33 2.7 OpRisk Profile in Different Financial Sectors 36 2.8 Risk Organization and Governance 43 3 Using OpRisk Data for Business Analysis 49 3.1 Cost Reduction Programs at Financial Firms 50 3.2 Using OpRisk Data to Perform Business Analysis 54 3.3 The Risk of Losing Key Talents: OpRisk in Human Resources 55 3.4 Systems Risks: OpRisk in Systems Development and Transaction Processing 56 3.5 Conclusions 59 4 Stress Testing OpRisk Capital and CCAR 61 4.1 The Need for Stressing OpRisk Capital Even Beyond the 99.9% 61 4.2 Comprehensive Capital Review and Analysis (CCAR) 62 4.3 OpRisk and Stress Tests 68 4.4 OpRisk in CCAR in Practice 69 4.5 Reverse Stress

Test 75 4.6 Stressing OpRisk Multivariate Models 75 5 Basic Probability Concepts in Loss Distribution Approach 79 5.1 Loss Distribution Approach 79 5.2 Quantiles and Moments 84 5.3 Frequency Distributions 87 5.4 Severity Distributions 88 5.5 Convolutions and Characteristic Functions 93 5.6 Extreme Value Theory 95 6 Risk Measures and Capital Allocation 101 6.1 Development of Capital Accords Base I, II and III 102 6.2 Measures of Risk 105 6.3 Capital Allocation 130 7 Estimation of Frequency and Severity Models 143 7.1 Frequentist Estimation 143 7.2 Bayesian Inference Approach 155 7.3 Mean Square Error of Prediction 160 7.4 Standard Markov Chain Monte Carlo Methods. 161 7.5 Standard MCMC Guidelines for Implementation 174 7.6 Advanced Markov chain Monte Carlo Methods 182 7.7 Sequential Monte Carlo Samplers and Importance Sampling 194 7.8 Approximate Bayesian Computation (ABC) Methods 212 7.9 Modelling Truncated Data 215 8 Model Selection and Goodness of Fit Testing 231 8.1 Qualitative Model Diagnostic Tools 231 8.2 Information Criterion for Model Selection 235 8.3 Goodness of Fit Testing for Model Choice (How to Account for Heavy Tails!) 239 8.4 Bayesian Model Selection 274 8.5 SMC Samplers Estimators of Model Evidence 276 8.6 Multiple Risk Dependence Structure Model Selection: Copula Choice 277 9 Flexible Parametric Severity Models: Basics 289 9.1 Motivation for Flexible Parametric Severity Loss Models 289 9.2 Context of Flexible Heavy Tailed Loss Models in OpRisk and Insurance LDA Models 290 9.3 Empirical Analysis Justifying Heavy Tailed Loss Models in OpRisk 292 9.4 Flexible Distributions for Severity Models in OpRisk 294 9.5 Quantile Function Heavy Tailed Severity Models 294 9.6 Generalized Beta Family of Heavy Tailed Severity Models 321 9.7 Generalized Hyperbolic Families of Heavy Tailed Severity Models 328 9.8 Halphen Family of Flexible Severity Models: GIG and Hyperbolic 338 10 Modelling Dependence 353 10.1 Dependence Modelling Within and Between LDA Model Structures 353 10.2 General Notions of Dependence 358 10.3 Dependence Measures and Tail Dependence 364 10.4 Introduction to Parametric Dependence Modeling Through a Copula 380 10.5 Copula Model Families for OpRisk 387 10.6 Copula Parameter Estimation in Two Stages: Inference For the Margins 416 10.7 Multiple Risk LDA Compound Poisson Processes and Levy Copula 420 10.8 Multiple Risk LDA: Dependence Between Frequencies via Copula 425 10.9 Multiple Risk LDA: Dependence Between the k-th Event Times/Losses 425 10.10 Multiple Risk LDA: Dependence Between Aggregated Losses via Copula 430 10.11 Multiple Risk LDA: Structural Model with Common Factors 432 10.12 Multiple Risk LDA: Stochastic and Dependent Risk Profiles 434 10.13 Multiple Risk LDA: Dependence and Combining Different Data Sources 437 10.14 A Note on Negative Diversification and Dependence Modelling 445 11 Loss Aggregation 447 11.1 Introduction 447 11.2 Analytic Solution 448 11.3 Monte Carlo Method 454 11.4 Panjer Recursion 457 11.5 Panjer Extensions 462 11.6 Fast Fourier Transform 463 11.7 Closed-Form Approximation 466 11.8 Capital Charge Under Parameter Uncertainty 471 12 Scenario Analysis 477 12.1 Introduction 477 12.2 Examples of Expert Judgements 480 12.3 Pure Bayesian Approach (Estimating Prior) 482 12.4 Expert Distribution and Scenario Elicitation: learning from Bayesian methods 484 12.5 Building Models for Elicited Opinions: Heirarchical Dirichlet Models 487 12.6 Worst Case Scenario Framework 489 12.7 Stress Test Scenario Analysis 492 12.8 Bow-Tie Diagram 495 12.9 Bayesian Networks 497 12.10 Discussion 504 13 Combining Different Data Sources 507 13.1 Minimum variance principle 508 13.2 Bayesian Method to Combine Two Data Sources 510 13.3 Estimation of the Prior Using Data 528 13.4 Combining Expert Opinions with External

and Internal Data 530 13.5 Combining Data Sources Using Credibility Theory 546 13.6 Nonparametric Bayesian approach via Dirichlet process 556 13.7 Combining using Dempster-Shafer structures and p-boxes 558 13.8 General Remarks 567 14 Multifactor Modelling and Regression for Loss Processes 571 14.1 Generalized Linear Model Regressions and the Exponential Family 571 14.2 Maximum Likelihood Estimation for Generalized Linear Models 573 14.3 Bayesian Generalized Linear Model Regressions and Regularization Priors 576 14.4 Bayesian Estimation and Model Selection via SMC Samplers 583 14.5 Illustrations of SMC Samplers Model Estimation and Selection for Bayesian GLM Regressions 585 14.6 Introduction to Quantile Regression Methods for OpRisk 590 14.7 Factor Modelling for Industry Data 597 14.8 Multifactor Modelling under EVT Approach 599 15 Insurance and Risk Transfer: Products and Modelling 601 15.1 Motivation for Insurance and Risk Transfer in OpRisk 602 15.2 Fundamentals on Insurance Product Structures for OpRisk 604 15.3 Single Peril Policy Products for OpRisk 609 15.4 Generic Insurance Product Structures for OpRisk 611 15.5 Closed Form LDA Models with Insurance Mitigations 621 16 Insurance and Risk Transfer: Pricing 663 16.1 Insurance Linked Securities and Catastrophe Bonds for OpRisk 664 16.2 Basics of Valuation of Insurance Linked Securities and Catastrophe Bonds for OpRisk 679 16.3 Applications of Pricing Insurance Linked Securities and Catastrophe Bonds 709 16.4 Sidecars, Multiple Peril Baskets and Umbrellas for OpRisk 726 16.5 Optimal Insurance Purchase Strategies for OpRisk Insurance via Multiple Optimal Stopping Times 733 A. Miscellaneous Definitions and List of Distributions 751 A.1 Indicator Function 751 A.2 Gamma Function 751 A.3 Discrete Distributions 752 A.4 Continuous Distributions 753 Index 811 .

---

#### Sommario/riassunto

"Co-edited by acknowledged experts in the quantification of operational risk, Handbook of Operational Risk conveniently and systematically displays all of the financial engineering topics, theories, applications, and current statistical methodologies that are intrinsic to the subject matter. This one-stop guide for financial engineers, quantitative analysts, and risk managers places under one cover all of the necessary theory, applications, and models that are inherent in any discussion of the subject. The authors emphasize the importance of collecting high-quality data based upon understanding the problems that impede the gathering process"--

"Systematically displays all of the financial engineering topics, theories, applications, and current statistical methodologies that are intrinsic to the quantification of operational risk"--

---