Contents

Introduction	1
PART ONE	
Risk Identification	
CHAPTER 1 Moving Beyond Uncertainty A Brief History of Risk: What Exactly Is Risk? Uncertainty versus Risk Why Is Risk Important in Making Decisions? Dealing with Risk the Old-Fashioned Way The Look and Feel of Risk and Uncertainty Integrated Risk Analysis Framework Questions	11 11 12 14 16 20 22 27
PART TWO	2/
Risk Evaluation	
CHAPTER 2 From Risk to Riches Taming the Beast	31 31
The Basics of Risk The Nature of Risk and Return The Statistics of Risk	32 33 34
The Measurements of Risk Appendix—Computing Risk Questions	39 41 48
CHAPTER 3 A Guide to Model-Building Etiquette Document the Model	49 49
Separate Inputs, Calculations, and Results	53

Protect the Models	54
Make the Model User-Friendly: Data Validation and Alerts	55
Track the Model	57
Automate the Model with VBA	57
Model Aesthetics and Conditional Formatting	58
Appendix—A Primer on VBA Modeling and Writing Macros	59
Exercises	68
PART THREE	
Risk Quantification	
CHAPTER 4	
On the Shores of Monaco	73
What Is Monte Carlo Simulation?	74
Why Are Simulations Important?	74
Comparing Simulation with Traditional Analyses	77
Using Risk Simulator and Excel to Perform Simulations	82
Questions	85
CHAPTER 5	
Test Driving Risk Simulator	86
Getting Started with Risk Simulator	87
Running a Monte Carlo Simulation	88
Using Forecast Charts and Confidence Intervals	97
Correlations and Precision Control	100
Appendix—Understanding Probability Distributions	107
Questions	129
CHAPTER 6 Pandora's Toolbox	1/19
Tornado and Sensitivity Tools in Simulation	142
Sensitivity Analysis	142 150
Distributional Fitting: Single Variable and Multiple Variables	154
Bootstrap Simulation	159
Hypothesis Testing	163
Data Extraction, Saving Simulation Results, and	103
Generating Reports	164
Custom Macros	167
Appendix—Goodness-of-Fit Tests	167
Questions	169
	10)

PART FOUR	
Industry Applications	
CHAPTER 7	
Extended Business Cases I: Pharmaceutical and Biotech Negotiations, Oil and Gas Exploration,	
Financial Planning with Simulation, Hospital Risk Management, and	107
Risk-Based Executive Compensation Valuation	187
Case Study: Pharmaceutical and Biotech Deal Structuring Case Study: Oil and Gas Exploration and Production	188 207
Case Study: Financial Planning with Simulation	219
Case Study: Hospital Risk Management	229
Case Study: Risk-Based Executive Compensation Valuation	249
Case Study. Risk-Based Executive Compensation valuation	277
PART FIVE	
Risk Prediction	
CHAPTER 8	
Tomorrow's Forecast Today	261
Different Types of Forecasting Techniques	261
Running the Forecasting Tool in Risk Simulator	262
Time-Series Analysis	263
Multivariate Regression	267
Stochastic Forecasting	271
Nonlinear Extrapolation	276
Box-Jenkins ARIMA Advanced Time-Series	279
Questions	283
CHAPTER 9	
Using the Past to Predict the Future	297
Time-Series Forecasting Methodology	297
No Trend and No Seasonality	298
With Trend but No Seasonality	304
No Trend but with Seasonality	308
With Seasonality and with Trend	312
Regression Analysis	314
The Pitfalls of Forecasting: Outliers, Nonlinearity,	
Multicollinearity, Heteroskedasticity, Autocorrelation,	

and Structural Breaks

Appendix A—Forecast Intervals

Appendix B—Ordinary Least Squares

Other Technical Issues in Regression Analysis

329

336

338

339

Appendix C—Detecting and Fixing Heteroskedasticity Appendix D—Detecting and Fixing Multicollinearity Appendix E—Detecting and Fixing Autocorrelation Questions Exercise	342 343 345 346 346
PART SIX	
Risk Diversification	
CHAPTER 10	
The Search for the Optimal Decision	349
What Is an Optimization Model?	349
The Traveling Financial Planner	350
The Lingo of Optimization	352
Solving Optimization Graphically and Using Excel's Solver	355
Questions	361
CHAPTER 11	
Optimization Under Uncertainty	909
Optimization Procedures	362
Continuous Optimization	362 365
Discrete Integer Optimization	363
Appendix—Computing Annualized Returns and Risk for	3/1
Portfolio Optimization	375
Question	378
Exercise	378
LACICISC	3/8
PART SEVEN	
Risk Mitigation	
CHAPTER 12	
What Is So Real About Real Options, and Why Are They Optional?	381
What Are Real Options?	381
The Real Options Solution in a Nutshell	383
Issues to Consider	384
Implementing Real Options Analysis	385
Industry Leaders Embracing Real Options	386
What the Experts Are Saying	390
Criticisms, Caveats, and Misunderstandings in Real Options	392
Questions	394

CHAPTER 13	
The Black Box Made Transparent: Real Options Super Lattice Solver Software	005
Introduction to the Real Options Super Lattice	395
Solver Software	396
Single Asset Super Lattice Solver	398
Multiple Super Lattice Solver	405
Multinomial Lattice Solver	408
SLS Excel Solution	410
SLS Functions	413
Lattice Maker	415
	113
PART EIGHT	
More Industry Applications	
CHAPTER 14	
Extended Business Cases II:	
Real Estate, Banking, Military Strategy, Automotive	
Aftermarkets, Global Earth Observation Systems, and	
Employee Stock Options	419
Case Study: Understanding Risk and Optimal Timing in a	
Real Estate Development Using Real Options Analysis	420
Case Study: Using Stochastic Optimization and Valuation Models	
to Evaluate the Credit Risk of Corporate Restructuring	435
Case Study: Real Options and KVA in Military Strategy at the	
United States Navy	441
Case Study: Manufacturing and Sales in the	
Automotive Aftermarket	452
Case Study: The Boeing Company's Strategic Analysis of the	
Global Earth Observation System of Systems	462
Case Study: Valuing Employee Stock Options Under the	
2004 FAS 123R	472
PART NINE	
Risk Management	
CHAPTER 15 The Warning Signs	FOE
The Problem of Negligent Entrustment	505
Management's Due Diligence	505
Transaction of Duc Dingelier	506

Index		591
About	the CD-ROM	588
Answ	ers to End of Chapter Questions and Exercises	580
Real	Options Analysis Values	566
	etribution Critical Statistics	558
	Square Critical Values	556
	orm Random Numbers	554
	lom Numbers (multiple digits)	552
	nal Random Numbers	550
	in-Watson Critical Values (alpha 0.05)	549
Stude	ent's t-Distribution (one tail and two tails)	548
	dard Normal Distribution (full area)	547
Stand	lard Normal Distribution (partial area)	546
	s You Really Need	545
Notes		535
IVI	aking Tomorrow's Forecast Today	533
	nange-Management Issues and Paradigm Shifts	529
	ow to Get Risk Analysis Accepted in an Organization	529
	langing a Corporate Culture	529
	TER 16	
Q	uestions	528
	eading the Warning Signs in Optimization Under Uncertainty	526
Re	Forecasting and Regression eading the Warning Signs in Real Options Analysis	519 524
Re	eading the Warning Signs in Time-Series	
	eading the Warning Signs in Monte Carlo Simulation	508
Sin		