ASWATH DAMODARAN

STRATEGIC RISK TAKING

A FRAMEWORK FOR RISK MANAGEMENT

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A Framework for Risk Management

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A Framework For Risk Management

ASWATH DAMODARAN

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To my wife, Michele, and my children, Ryan, Brendan, Kendra, and Kiran, who make it all worthwhile.

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CONTENTS

Introduction
A Roadmap for Understanding Risk xvii

Chapters 1–4
The Economists' View of Risk Aversion and the Behavioral Response 1

Chapter 1
What Is Risk? 3
- A Very Short History of Risk 3
- Defining Risk 5
- Dealing with Risk 7
  - Risk and Reward 7
  - Risk and Innovation 7
- Risk Management 8
  - The Conventional View and Its Limitations 8
  - A More Expansive View of Risk Management 9
- Conclusion 9

Chapter 2
Why Do We Care About Risk? 11
- The Duality of Risk 11
- I Am Rich, But Am I Happy? Utility and Wealth 12
  - The St. Petersburg Paradox and Expected Utility: The Bernoulli Contribution 12
  - Mathematics Meets Economics: Von Neumann and Morgenstern 14
  - The Gambling Exception? 16
  - Small Versus Large Gambles 17
- Measuring Risk Aversion 18
  - Certainty Equivalents 18
  - Risk Aversion Coefficients 20

Other Views on Risk Aversion 23
Prospect Theory 26
Consequences of Views on Risk 28
Investment Choices 28
Corporate Finance 29
Valuation 30
Conclusion 30

Chapter 3
What Do We Think About Risk? 35
General Principles. 35
Evidence on Risk Aversion 36
Experimental Studies 36
Survey Measures 47
Pricing of Risky Assets 50
Evidence from Racetracks, Gambling, and Game Shows 57
Propositions about Risk Aversion 61
Conclusion 63

Chapter 4
How Do We Measure Risk? 65
Fate and Divine Providence 65
Estimating Probabilities: The First Step to Quantifying Risk 66
Sampling, The Normal Distributions, and Updating 68
The Use of Data: Life Tables and Estimates 70
The Insurance View of Risk 70
Financial Assets and the Advent of Statistical Risk Measures 71
The Markowitz Revolution 73
Efficient Portfolios 73
The Mean-Variance Framework 74
Implications for Risk Assessment 76
Introducing the Riskless Asset—The Capital Asset Pricing Model (CAPM) Arrives 77
Mean Variance Challenged. 78

Fat Tails and Power-Law distributions 79
Asymmetric Distributions 81
Jump Process Models 83
Data Power: Arbitrage Pricing and Multifactor Models 83
Arbitrage Pricing Model 84
Multifactor and Proxy Models 85
The Evolution of Risk Measures 86
Conclusion 86

Chapters 5–8
Risk Assessment: Tools and Techniques 97

Chapter 5
Risk-Adjusted Value 99
Discounted Cash Flow Approaches 99
The DCF Value of an Asset 100
Risk-Adjusted Discount Rates 101
Certainty-Equivalent Cash Flows 106
Hybrid Models 111
DCF Risk Adjustment: Pluses and Minuses 116
Post-Valuation Risk Adjustment 117
Rationale for Post-Valuation Adjustments 117
Downside Risks 118
Other Discounts 125
Upside Risks 126
The Dangers of Post-Valuation Adjustments 127
Relative Valuation Approaches 128
Basis for Approach 128
Risk Adjustment 129
DCF Versus Relative Valuation 130
The Practice of Risk Adjustment 130
Conclusion 131
Fixed Discount 136

Firm-Specific Discount 137
Determinants of Illiquidity Discounts 137
Estimating Firm-Specific Illiquidity Discount 139
Synthetic Bid-Ask Spread 142
Option-Based Discount 143

Chapter 6
Probabilistic Approaches: Scenario Analysis, Decision Trees, and Simulations 145
Scenario Analysis 145
Best Case/Worst Case 146
Multiple Scenario Analysis 147
Decision Trees 153
Steps in Decision Tree Analysis 153
An Example of a Decision Tree 156
Use in Decision Making 160
Issues 161
Risk-Adjusted Value and Decision Trees 162
Simulations 164
Steps in Simulation 164
An Example of a Simulation 168
Use in Decision Making 173
Simulations with Constraints 174
Issues 176
Risk-Adjusted Value and Simulations 177
An Overall Assessment of Probabilistic Risk Assessment Approaches 179
Comparing the Approaches 179
Complement or Replacement for Risk Adjusted Value 180
In Practice 181
Conclusion 182
Fitting the Distribution 183
Is the Data Discrete or Continuous? 183
How Symmetric Is the Data? 188

Are There Upper or Lower Limits on Data Values? 194
How Likely Are You to See Extreme Values of Data, Relative to the Middle Values? 195
Tests for Fit 196
Tests of Normality 198
Conclusion 199

CHAPTER 7
Value at Risk (VaR) 201
What Is VaR? 201
A Short History of VaR 202
Measuring VaR 204
Variance-Covariance Method 204
Historical Simulation 210
Monte Carlo Simulation 214
Comparing Approaches 217
Limitations of VaR 218
VaR Can Be Wrong 218
Narrow Focus 221
Suboptimal Decisions 222
Extensions of VaR 223
VaR as a Risk Assessment Tool 225
Conclusion 227

CHAPTER 8
Real Options 231
The Essence of Real Options 231
Real Options, Risk-Adjusted Value, and Probabilistic Assessments 233
Real Option Examples 235
The Option to Delay an Investment 235
The Option to Expand 246
The Option to Abandon an Investment 253
Caveats on Real Options 257
Real Options in a Risk Management Framework 260

Conclusion 261
Option Payoffs 262
Determinants of Option Value 264
Option Pricing Models 266
The Binomial Model 266
The Black-Scholes Model 270

CHAPTERS 9–12
Risk Management: The Big Picture 277

CHAPTER 9
Risk Management: The Big Picture 279
Risk and Value: The Conventional View 280
Discounted Cash Flow Valuation 280
Relative Valuation Models 285
Expanding the Analysis of Risk 287
Discounted Cash Flow Valuation 288
Relative Valuation 295
Option Pricing Models 298
A Final Assessment of Risk Management 301
When Does Risk Hedging Pay Off? 302
When Does Risk Management Pay Off? 303
Risk Hedging Versus Risk Management 303
Developing a Risk Management Strategy 304
Conclusion 306

CHAPTER 10
Risk Management: Profiling and Hedging 309
Risk Profile 309
Step 1: List the Risks 310
Step 2: Categorize the Risks 310
Step 3: Measure Exposure to Each Risk 311
Step 4: Analyze the Risks 318

To Hedge or Not to Hedge? 319
The Costs of Hedging 319
The Benefits of Hedging 320
The Prevalence of Hedging 326
Does Hedging Increase Value? 329
Alternative Techniques for Hedging Risk 331
Investment Choices 331
Financing Choices 332
Insurance 333
Derivatives 334
Picking the Right Hedging Tool 338
Conclusion 339

CHAPTER 11
Strategic Risk Management 341
Why Exploit Risk? 341
Value and Risk Taking 342
Evidence on Risk Taking and Value 344
How Do You Exploit Risk? 345
The Information Advantage 346
The Speed Advantage 348
The Experience/Knowledge Advantage 350
The Resource Advantage 352
Flexibility 353
Building the Risk-Taking Organization 356
Corporate Governance 356
Personnel 358
Reward/Punishment Mechanisms 360
Organization Size, Structure, and Culture 363
Conclusion 365

Chapter 12
Risk Management: First Principles 367

1. Risk Is Everywhere 367
2. Risk Is Threat and Opportunity 369
3. We Are Ambivalent About Risks and Not Always Rational About the Way We Assess or Deal with Risk 369
4. Not All Risk Is Created Equal 370
5. Risk Can Be Measured 372
6. Good Risk Measurement/Assessment Should Lead to Better Decisions 373
7. The Key to Good Risk Management Is Deciding Which Risks to Avoid, Which Ones to Pass Through, and Which to Exploit 374
8. The Payoff to Better Risk Management Is Higher Value 375
9. Risk Management Is Part of Everyone's Job 376
10. Successful Risk-Taking Organizations Do Not Get There by Accident 376
Conclusion 378

Index 379

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To risk takers everywhere.

ABOUT THE AUTHOR

Aswath Damodaran is a professor of finance and David Margolis teaching fellow at the Stern School of Business at New York University. He teaches the corporate finance and equity valuation courses in the MBA program. He received his MBA and PhD from the University of California at Los Angeles. His research interests lie in valuation, portfolio management, and applied corporate finance. He has been published in the *Journal of Financial and Quantitative Analysis*, the *Journal of Finance*, the *Journal of Financial Economics*, and the *Review of Financial Studies*. He has written three books on equity valuation (*Damodaran on Valuation*, *Investment Valuation,* and *The Dark Side of Valuation*) and two on corporate finance (*Corporate Finance: Theory and Practice*, *Applied Corporate Finance: A User's Manual*). He has coedited a book on investment management with Peter Bernstein (*Investment Management*) and has written a book on investment philosophies (*Investment Philosophies*). His newest book on portfolio management is titled *Investment Fables* and was published in 2004. He was a visiting lecturer at the University of California, Berkeley, from 1984 to 1986, where he received the Earl Cheit Outstanding Teaching Award in 1985. He has been at NYU since 1986 and received the Stern School of Business Excellence in Teaching Award (awarded by the graduating class) in 1988, 1991, 1992, 1999, 2001, and 2007, and was the youngest winner of the University-wide Distinguished Teaching Award (in 1990). He was profiled in *Business Week* as one of the top 12 business school professors in the United States in 1994.

A ROADMAP FOR UNDERSTANDING RISK

This book is written for three very diverse and different audiences—people who have to manage and make the big decisions on risk (risk managers), analysts and others whose job it is to assess risk (risk assessors), and students of risk who are interested in getting a perspective on how the thinking on risk has evolved over time.

The study of risk has its deepest roots in economics and insurance. For centuries, researchers have attempted to grapple with the basic question of what risk is and how to measure risk aversion. Chapters 1 through 4 represent my attempt to give some historical perspective on how our thinking has evolved over the past few centuries, with a healthy dose of what psychologists have discovered in recent years about how human beings react to risk. In particular, these studies find that human beings are neither as rational nor as easy to categorize when it comes to behavior when confronted with risk as traditional economists had assumed them to be. Although much of this work would usually be categorized as behavioral economics or finance, understanding the findings is the first step to managing risk.

The next four chapters (Chapters 5–8) look at how risk assessment techniques have evolved over time. Chapter 5 has its roots in portfolio theory and examines ways in which we can adjust the value of risky assets for that risk. Chapter 6 borrows heavily from the decision sciences and statistics and discusses ways in which probabilistic approaches can be used to evaluate risk. Chapter 7 takes a closer look at value at risk (VaR), an extension of the probabilistic approach that has acquired a substantial following particularly in commercial and investment banks. Chapter 8 returns to financial theory and looks at how extensions of option pricing models can be used to incorporate the potential upside from risk exposure.

The last four chapters of this book represent an attempt to meld traditional finance and corporate strategy to arrive at a complete story for risk management, which goes beyond just risk hedging (which has been the finance focus) or competitive advantages (which has been the strategic imperative). These chapters represent the most innovative part of

this book, because they attempt to bring together analyses and insights from different functional areas into a big picture of risk management.

The three groups—economists, risk assessors, and risk managers—have different skills and interests, and the tension shows in the book, with each part of the book reflecting these differences. Each group will find a portion of the book most attuned to their interests with the other parts representing more of a hike into unfamiliar but rewarding territory.

This book is modular and can be read in parts. In other words, there is little in the first eight chapters that I draw on in the last four chapters. Much as I would love to believe that you will buy this book and read it cover to cover, I am a realist. Given your time constraints and interests, you may skip through sections to get to the parts you want to read. In other words, if you are already familiar with risk assessment tools and are more interested in the big picture of risk management, skip forward to Chapter 9. If, on the other hand, you are more interested in risk assessment and how the different approaches fit together, you can browse through Chapters 5 through 8. Having said that, there is value added to looking at the parts not specifically aimed at you. In other words, risk assessors and analysts will be able to do their jobs better if they understand how what they do (from risk adjusting discount rates to simulations) fits into the big picture of risk management. At the same time, risk managers will be able to define what risk assessments they need if they can see the whole array of choices. Finally, economists studying risk aversion may gain from knowing the practical issues facing both risk assessors and risk managers. As I note, there is an extraordinary number of basic and critical questions that are unanswered in the theory.

There are excellent books and papers in each of the three areas right now, but they focus on one of the three, largely because different disciplines have been involved in each one: traditional economics and behavioral economics for the first part, corporate finance for the second, and corporate strategy for the third. I have tried to bridge the different functional areas across this book. It is entirely possible that people in any one of these functional areas will view what I say (in the section directed at them) as too simplistic or already well established, but I hope I have been able to bring insights into each of the three areas from being aware of the other two.

I do not claim that anything in this book, standing by itself, is new and revolutionary. In fact, I will concede that each chapter covers a topic that has been covered in more depth elsewhere, with entire books dedicated to some topics; there are several books on real options and quite a few on VaR, for instance. What I think is lacking in the areas of risk management is a spanning of work done in different areas with a link to practical risk management. Consequently, I used my own biased perspectives to try to create a narrative that would be useful to a decision maker involved in risk analysis and management. I hope you find it useful.

INDEX

Page numbers followed by *n* indicate footnotes.

A

abandonment. *See* option to abandon (real options)
absolute value, 222
acts of God, 334
actuarial tables, 70
adaptive behavior, 232
age, effect on risk aversion, 42, 49
airline industry example (scenario analysis), 148-151
Allais, 38
Amaranth (hedge fund), 47
American options
  in Black-Scholes option pricing model, 272-273
  European options versus, 264
Amihud, Y., 120, 122
analysis of data, importance of, 377
analyzing risks in risk profiles, 318-319
ancient civilizations
  insurance in, 70
  measuring risk in, 65-66
Anderson-Darling test, 198
Antikarov, V., 234
Apple, flexibility of, 356
arbitrage pricing model, 84, 95-96, 102
ARCH (autoregressive conditional heteroskedasticity), 209
Arrow-Pratt measure of risk aversion, 36
assessing risk. *See* risk assessment
asset pricing, as measure of risk aversion, 50-57
  bond pricing, 56
  implied equity risk premium, 50-56
  limitations of, 57
  option pricing, 56
asymmetric distributions, 81-82
asymmetric risks, symmetric risks versus, 370
auctions, lotteries versus, 40

B

Bachelier, Louis, 72
Bajaj, M., 140
Bakshi, G., 49
Ball, C. A., 83
Baltussen, G., 60
Banker's Trust, 203
Barbon, Nicholas, 71
Barings (investment bank), 203
Basak, S., 223
Bayes, Thomas, 69
Bayesian statistics, 69-70
Beckers, S., 83
bell curve, 68
Benartzi, Shlomo, 44
Berg, Joyce, 40, 41
Bernasek, A., 49
Bernoulli, Jacob, 35, 38, 68
Bernstein, Peter, 65
best-case scenario analysis, 146
Beta distributions, 192
betting. *See* gambling
bid-ask spreads, 142
binomial option pricing model, 269-270
bionomial distributions, 184
Black-Scholes option pricing model, 270-275
Blume, M. E., 47
Boeing example (scenario analysis), 148-151
bond market, illiquidity cost, 122
bond pricing, as measure of risk aversion, 56
Books on the Game of Chance (Cardano), 66
book value constraints, 174-175
book value multiples, 285
bottom-up beta, 101
Boudoukh, J., 212
Bowman paradox, 345
break-even effect, 45, 62
Buffett, Warren, 73
Byrnes, James, 42

C

C-FaR (cash flow-at-risk), 224-225
Cabedo, J. D., 210, 213
call options, 336
  explained, 262
  payoff diagram of, 236
  risk management as, 301
Camerer, C., 41
capital, access in crises, 352-353
capital market frictions, 322
capital structure benefits of hedging risks, 325
CAPM (capital asset pricing model), 77-78, 89-94, 101-102
Cardano, Girolamo, 66
Card Sharks (game show), 59
cash flow-at-risk (C-FaR), 224-225
cash flow haircuts, for certainty-equivalent cash flows, 109-110
cash flows. *See* discounted cash flow valuation
casinos. *See* gambling
catastrophic risk, small risk versus, 311
categorizing risks, 310-311
Cauchy distributions, 189
certainty-equivalent cash flows, 106-111
  cash flow haircuts for, 109-110
  combining with risk, 115
  combining with risk-adjusted discount rate, 111-116
  risk-adjusted discount rate versus, 110-111

risk-and-return models for, 108-109
utility functions for, 107-108
Chen, N., 85
Chen, Z., 49
children, number of (effect on risk aversion), 43
Christensen, Clayton, 354
Cichetti, C. J., 48
Cohen, Allon, 42
commodity companies, risk assessment methods in, 181
commodity price risk, hedging, 329
comparable assets, 128
comparable firms, 286
compensation systems, 360-363
competitive advantages
in option to expand (real options), 249
real options and, 258
component VaR, 224
composite discount rate, item-specific discount rate versus, 105
computing. *See* **measuring**
concave tax functions, 321
concurrent risk. *See* **scenario analysis**
conditional probabilities, 69
conditional VaR, 224
consequences of views on risk. *See* **duality of risk**
consolidated cost of capital, 102*n*
constraints
book value constraints in simulations, 174-175
on data values, 194-195
earning and cash flow constraints in simulations, 175
market value constraints in simulations, 176
on real options, 257-259
consumption levels, 55
continuous data, discrete data versus, 183-187
continuous risk
discontinuous risk versus, 371
event risk versus, 311
control premiums, 126
conventional valuation. *See* **valuation**
convex effective tax functions, 321
Copeland, T. E., 234
corporate governance structure, risk taking and, 356-358
correlated risks, in risk assessment, 179
correlation across variables, 167
correlation estimates, errors in VaR, 219
cost of delay, 238
costs of hedging risks, 319-320
country bond default spreads, 132-135
country risk premiums, 132-135
crises. *See* **risk taking, advantages for**
crisis managers, characteristics of, 358-360, 378
cross-border acquisitions, 351*n*
cross-sectional data, for probability distributions, 166
cultural differences, effect on risk aversion, 43
culture of organization
risk management and, 376-378
risk taking and, 363-365
customer incentives, option to abandon (real options) and, 256

D

Das, S., 124
data mining and reporting, 37
data values, limits on, 194-195
DCF. *See* **discounted cash flow valuation**
Deal or No Deal **(game show), 60**
debt-matching strategy, for hedging risks, 332-333
decision frames, for crisis managers, 359
decision making
decision tree usage, 160
limitations of VaR, 222-223
risk assessment and, 373-374
scenario analysis in, 151-152
simulation usage, 173-174
decision nodes (decision trees), 154
decision trees, 153-154
comparison with other risk assessment methods, 179-180
decision making, usage in, 160
examples of, 156-160
problems with, 161
real options versus, 231-234
risk-adjusted value and, 162-164, 180-181
steps in, 153-156
default ratings, 132-135
delay. *See* **option to delay (real options)**
DeMarzo, P. M., 326
De Moivre, Abraham, 68
deregulated electricity markets, risk assessment methods in, 181
derivatives, hedging risks with, 334-338
design of experimental studies, 37-38
design of surveys, 47-48
Dickhaut, J., 41
disaster insurance, 54
discontinuous risks, continuous risks versus, 371
discounted cash flow valuation, 99-100, 280
advantages and disadvantages, 116
certainty-equivalent cash flows, 106-111
decision trees and, 162-164
hybrid models, 111-116
inputs for, 288-290
real options versus, 233-234
relative valuation risk adjustment versus, 130
risk-adjusted discount rates, 101-106
risk adjustment in, 281-282
risk hedging, effect of, 283-284
risk hedging versus risk management
in cash flows from existing assets, 292
in discount rates, 291-292
in expected growth rates, 292-293
length of high growth period, 293-294
risk management, effect of, 284-285
risk payoff of, 342
simulations and, 177-178
structure of, 280-281
discount rates, 291-292
discrete data, continuous data versus, 183-187
discrete uniform distributions, 187

Disney example
option to expand (real options), 247-248
risk exposure measurement, 314-318
distress cost benefits of hedging risks, 323-324
distributions. *See* statistical distributions
distruptive innovations, 354-355
diversification
CAPM (capital asset pricing model), 77-78, 89-94
Markowitz approach, 73-77
risk measurement and, 72
dividends
in Black-Scholes option pricing model, 272
effect on options, 265
divine providence, risk measurement and, 65-66
double-counted risk, 162-163
downside of risk. *See* duality of risk
downside risks, 118-125, 136-144
drivers. *See* inputs
drug-testing example (decision trees), 156-160
duality of risk, 369
Dubin, J. A., 48
Duffie, D., 326
Dyer, Douglas, 42
dynamic obsolescence, 353*n*

E

EaR (earnings at risk), 225
Earl, Harley, 353*n*
early exercise of options, 272-273
earning and cash flow constraints, 175
earnings at risk (EaR), 225
earnings multiples, 285
earnings risk exposure, value risk exposure versus, 311-313
eBay auctions, Yahoo! auctions versus, 41*n*
economic exposure, 312
economic risk, physical risk and, 3-5. *See also* risk
education differences, effect on risk aversion, 49
Efficient Frontier, 74, 91
efficient market hypothesis, foundation for, 72
Elron, Efrat, 42
emotions, effect on risk aversion, 46
empirical evidence
of illiquidity cost, 122-124
on risk aversion, 36
asset pricing, 50-57
experimental studies, 36-47
gambling habits, 58-59
game shows, 59-61
survey measures, 47-50
end nodes (decision trees), 154
Engle, R., 209
English clock auctions, 41*n*
equity risk premium
anomalies in, 53-56
estimating country risk premiums, 132-135
measuring, 50-53
in risk-and-return models, 101
equity valuation, 280-282
errors in VaR, 218-221
escape clauses, option to abandon (real options) and, 255-256
estimating probabilities, 66-68
European options, American options versus, 264
evaluating risk. *See* risk assessment
event nodes (decision trees), 153
event risk, continuous risk versus, 311
evidence. *See* empirical evidence
evolution of risk measurement, 86
exchange rates, 311-312, 328
exclusivity in real options, 233, 258
exercise prices. *See* strike prices (options)
expansion. *See* option to expand (real options)
expected growth rates, 292-293
experienced versus naive (effect on risk aversion), 42
experience in crises, 350-352
experimental design, 37-38
experimental studies of risk aversion, 36-47
design of experiments, 37-38
findings
break-even effect, 45
extent of risk aversion, 38-40
framing, 43
house money effect, 45
loss aversion, 44-45
structure of experiment, 40-42
subgroup differences, 42-43
expiration of option
effect of, 265
in option to delay (real options), 238
explicit costs of hedging, 319
exploiting risks. *See* risk taking
exponential function, 192
exposure to risk, measuring, 311-318
extensions of VaR, 223-225
extent of risk aversion, 38-40
extreme data values, 195-196
extreme value distributions, 194
extreme value theory, 224

F

factor analysis, 84
factor betas, 84, 95
failed experimental studies, 38
failure, tolerance of, 364
Fama, E. F., 80, 85, 102
fate, risk measurement and, 65-66
fat tails, 79-82
FCFE (free cash flow to equity), 280
FCFF (free cash flow to firm), 280
FDA approval process example (decision trees), 156-160
female versus male (effect on risk aversion), 42, 49
Fermat, Pierre de, 67
Financial and Operating Combined Uniform Single (FOCUS) reports, 203
financial assets
diversification. *See* diversification
statistical risk measures for, 71-73
financial flexibility, option to expand (real options) and, 251-253

financial markets, risk in, 368
Financial Review of Reviews, 72
financial risk, operating risk versus, 311
financing decisions for hedging risks, 332-333
findings
of experimental studies
break-even effect, 45
extent of risk aversion, 38-40
framing, 43
house money effect, 45
loss aversion, 44-45
structure of experiment, 40-42
subgroup differences, 42-43
of survey measures of risk aversion, 48-49
firm-specific illiquidity discounts, 137-141
firm-specific risk
hedging, 283-284
market risk versus, 310
firm valuation, equity valuation versus, 282
firm value
defined, 314
operating income versus, 317
first-price auctions, 41*n*
Fitch (bond ratings service), 72
fixed illiquidity discounts, 136-137
flexibility in crises, 353-356, 377
FOCUS (Financial and Operating Combined Uniform Single) reports, 203
folding back decision trees, 155
Ford, Henry, 353
forward contracts, hedging risks with, 335-338
fractal geometry, 81
framing, 43, 62
free cash flow to equity (FCFE), 280
free cash flow to firm (FCFF), 280
French, K. R., 85, 102
Friend, I., 47
Froot, K. A., 323
Frye, J., 216
full risk analysis, selective risk analysis versus, 179
futures contracts
hedging risks with, 336-338
options versus, 336

G

Galileo, 67
gambling habits, as measure of risk aversion, 58-59
game shows, as measure of risk aversion, 59-61
Gamma distributions, 191
Garbade, Ken, 203
GARCH (generalized autoregressive conditional heteroskedasticity), 209
Gaussian distribution, 68
gender differences, effect on risk aversion, 42, 49
generalized autoregressive conditional heteroskedasticity (GARCH), 209
General Motors, flexibility of, 353
geometric distributions, 186
Gercy, C., 325
Giddy, I., 338
Glasserman, P., 216
global nature of risk, 367
Golder, Peter, 355
Graham, Ben, 73
Graham, J. R., 321
Graunt, John, 70
growth companies, option to expand (real options) and, 251

H

Haigh, M. S., 45
haircuts. *See* cash flow haircuts
Hallerback, W. G., 224
Halley, Edmund, 70
Harrison, G. W., 43
Hausch, D. B., 58
hedging risks. *See* risk hedging
Heidelberger, P., 216
Hendricks, D., 217
Hertz, David, 176
Hertzel, M., 141
heteroskedasticity, 209
high growth period, length of, 293-294
historical data
errors in VaR, 219
for probability distributions, 165
historical regression beta, 102
historical risk premium
anomalies in, 53-56
implied equity risk premium versus, 52-53
historical simulations
compared to variance-covariance and Monte Carlo simulations, 217-218
measuring VaR, 210-214
history
of risk, 3-5
of VaR, 202-204
Holt, Charles, 39, 42-43
Holton, Glyn, 5
Home Depot example (simulations), 168-173
homoskedasticity, 209
house-loss effect, 45*n*
house money effect, 45, 62
Hull, J., 208, 214
Hurst, H. E., 79*n*
Hurst exponent, 79*n*
hybrid models for discounted cash flow valuation, 111-116
hypergeometric distributions, 186

I

illiquidity, measuring, 118-120
illiquidity cost, empirical evidence of, 122-124
illiquidity discounts, 118-125, 136-144
implicit costs of hedging, 320
implied discount rates, for risk-adjusted discount rates, 104

implied equity risk premium, 50-52
anomalies in, 53-56
historical risk premium versus, 52-53
increased value, hedging risks for, 329-331
independent trials (experimental design), 37
informational benefits of hedging risks, 325-326
information availability, effect on risk aversion, 41
information mirages, 41
information networks, 346-348, 377
innovation, risk and, 7-8
inputs for discounted cash flow valuation, 288-290
inside information, 76*n*
institutional structure, effect on risk aversion, 41
insurance
hedging risks with, 333-334, 338
view of risk, 70-71
insurance decisions, risk surveys of, 48
Internet companies, option to expand (real options) and, 251
intrinsic valuation. *See* discounted cash flow valuation
intrinsic value, defined, 100
investment choices, risk surveys of, 47
investment decisions for hedging risks, 322-323, 331-332
irrational behavior, risk aversion and, 369-370
Isaac, Mark, 41
item-specific discount rate, composite discount rate versus, 105

J–K

J. P. Morgan, RiskMetrics service, 203, 206, 208
Jagannathan, M., 124
James, Duncan, 41
Jamshidan, Farshid, 216
Jarrow, R. A., 83
Jeopardy! (game show), 60
Jianakoplos, N. A., 49
Johnson, B. A., 123
Johnson, E. J., 45-46
Ju, X., 223
Jullien, B., 59
jump process distributions, 83

Kachmeimeir, Steven, 39
Kagel, John, 42
Kahneman, D., 35, 41, 43-44, 359
Katrina (hurricane), insurance losses in, 71
Kearny, John, 328
Knight, Frank, 5
Knowledge Management (KM), 351
Kolmogorov-Smirnov test, 198
kurtosis. *See* fat tails

L

LaGattuta, D., 225
Lambadrais, G., 218
large risks, small risks versus, 370
Larsen, N., 224
Lau, M. I., 43
Laury, Susan, 39, 42-43
law of large numbers, 68
Levin, Dan, 42
Levy, Haim, 42
Lewent, Judy, 328
life cycle risk aversion hypothesis, 49
life tables. *See* actuarial tables
limits. *See* constraints
linear tax functions, 321
Lingo (game show), 61
Lintner, John, 77
liquidation, transactions costs and, 118. *See also* illiquidity discounts
liquidity, value of, 121
List, J. A., 45
listing risks, 310
Ljungquist, A., 124
Lloyd's of London, 71
logistic distributions, 189
lognormal distributions, 191
long-shot bias, 58-59, 62
long-term risks, short-term risks versus, 371
Longstaff, F. A., 121
loss aversion, 62
in crisis managers, 359
effect on risk aversion, 44-45
lotteries, auctions versus, 40
Lovallo, D., 359

M

Maher, J. M., 123
Mains, B., 322
Majluf, N. S., 323
male versus female, effect on risk aversion, 42, 49
managerial risk aversion, 322
Mandelbrot, Benoit, 79
marital status, effect on risk aversion, 43, 49
market capitalization, 129
market portfolio, CAPM (capital asset pricing model), 77-78, 89-94
market prices. *See* asset pricing
market risk
firm-specific risk versus, 310
hedging, effect on value, 283-284
in VaR (value at risk), 221
market risk factors, 84
market structure, effect on risk aversion, 41
market value constraints, 176
Markowitz, Harry, 73, 203
Markowitz approach (risk measurement), 73-77
Markowitz portfolios, 91
Mausser, H., 224
Mayers, D., 333
McCabe, K., 41
McGrattan, E. R., 55
mean, in normal distributions, 68
mean-variance framework, 74-76, 89-94
challenges to, 78-83
asymmetric distributions, 81-82
jump process distributions, 83
power-law distributions, 79-81
implications of, 76-77

measuring
equity risk premium, 50-53
illiquidity, 118-120
risk. *See* risk assessment
risk exposure, 311-318
VaR. *See* VaR, measuring
Mehra, Rajnish, 54-55
Mendelson, H., 120, 122
Menkveld, A. J., 224
mental accounting, 44
men versus women, effect on risk aversion, 42, 49
Mian, S. I., 326
Miller, David, 42
Minton, B. A., 325
Monte Carlo simulations
compared to variance-covariance and historical simulations, 217-218
measuring VaR, 214-217
Moody's, 73
Morin, R. A., 49
mortality tables. *See* actuarial tables
Moya, I., 210, 213
multifactor models, 85-86, 102
multiperiod projects, single-period models for, 105
multiples, in relative valuation, 285-286
multistage projects, 249-251
Myers, S. C., 105, 323
myopic loss aversion, 41, 45, 56, 62

N

naive versus experienced, effect on risk aversion, 42
narrow definition of risk, 221-222
Nathaniel's Nutmeg **(Milton), 4*n***
natural resources example, option to delay (real options), 242-246
negative bionomial distributions, 186
negative book value of equity, 175
negative cash flows, positive cash flows versus, 105-106
negative outcomes, 6
nonstationary correlations, errors in VaR, 219
normal distributions, 68-69, 188, 198

O

objective risk, subjective risk versus, 5
old versus young, effect on risk aversion, 42, 49
operating exposure, 312
operating income, firm value versus, 317
operating risk, financial risk versus, 311
opportunity cost, as trading cost, 119
optimal value, 126
option-based illiquidity discounts, 143-144
option pricing, as measure of risk aversion, 56
option pricing models
binomial model, 269-270
Black-Scholes model, 270-275
real options and, 259
risk hedging and, 299-301
risk management and, 301
option to abandon (real options), 233, 253-257
option to delay (real options), 233-246
examples of, 239-246
problems with, 239
value estimates, 237-238
option to expand (real options), 233, 246-253
options. *See also* real options
American versus European, 264
call options, 262
defined, 262
futures contracts versus, 336
hedging risks with, 336-338
put options, 262-263
value, determining, 264-266
organizational culture and structure, risk management and, 376-378
organizations, elements of risk-taking organizations, 356, 377-378
corporate governance structure, 356-358
crisis managers, 358-360
reward/punishment mechanisms, 360-363
size, structure, and culture of organization, 363-365
outcomes of risk, 6
overexposure to risk, limitations of VaR, 223

P

Pacioli, Luca, 66
Pacioli Puzzle, 66-67
Papadopoulou, L., 218
parenthood, effect on risk aversion, 43
Pascal, Blaise, 67
Pascal's triangle, 67
patent example, option to delay (real options), 239-242
payoff diagrams, of call options, 236
Pearson, N. D., 223
physical risk, economic risk and, 3-5
planned experimental design, 37
Poisson distributions, 83, 184
population sizes, sampling, 68
Porter, Michael, 347, 364
portfolios, diversification. *See* diversification
positive cash flows, negative cash flows versus, 105-106
positive outcomes, 6
Post, T., 60
post-valuation risk adjustment, 117
control premiums, 126
illiquidity discounts, 118-125, 136-144
limitations of, 127
reasons for using, 117-118
synergy premiums, 127
posterior probabilities, 69
power-law distributions, 79-81
prerequisite investments, real options and, 257
Prescott, E. C., 54-55
price impact, as trading cost, 119
The Price Is Right **(game show), 60**
pricing assets. *See* asset pricing
principles of risk management
categories of risk, 370-371
decision making and risk assessment, 373-374
duality of risk, 369

hedging risk, 374-375
linking risk management and, 375-376
organizational culture and, 376-378
prevalence of risk, 367-369
responsibility for risk management, 376
risk assessment, 372
risk aversion and irrational behavior, 369-370
prior probabilities, 69
private businesses, trading costs of, 120
private equity, illiquidity cost, 124
private placements, illiquidity discounts, 140-141
probabilities
comparison of risk assessment methods, 179-180
decision trees. *See* decision trees
estimating, 66-68
risk-adjusted value and, 180-181
risk assessment methods, usage of, 181-182
risk versus, 6
scenario analysis. *See* scenario analysis
simulations. *See* simulations
statistical distributions. *See* statistical distributions
updating information, 69-70
probability distributions in simulations, defining, 165-167
profiles of risk. *See* **risk profiles**
proportionality, 359
proxy models, 85-86, 102-103
publicly traded stocks, illiquidity cost, 122
put-call parity, 274
put options, 336
explained, 262-263
risk hedging as, 299-301
value of, 274

Q–R

quadratic utility function, 75
Quadratic VaR measures, 209
qualitative risk exposure measurements, 313
quantitative risk exposure measurements, 313-318
questionnaires, risk surveys of, 48

racetrack betting, as measure of risk aversion, 58-59
racial differences, effect on risk aversion, 43, 49
random walk, foundation for, 72
ratio-based comparisons, 129
real assets, transactions costs of, 119
real options. *See also* **options**
constraints on, 257-259
decision trees versus, 231-234
explained, 231-233
option to abandon, 253-257
option to delay, 235-246
examples of, 239-246
problems with, 239
value estimates, 237-238
option to expand, 246-253
risk-adjusted value versus, 233-234
in risk management, 260
risk payoff of, 343-344
simulations versus, 234
Refenes, A. P. N., 220
regulatory capital restrictions, 174
reinvestment rates, 292
relative standard deviation, 133-135
relative valuation, 285
risk adjustment in, 128-130, 286-287
risk hedging in, 287, 295-298
risk management in, 298
structure of, 285-286
researcher bias, 37
resources in crises, 352-353
responsibility for risk management, 376
restricted stock
illiquidity cost, 123-124
illiquidity discounts, 139-140
return distributions, errors in VaR, 219
return on capital, 293
revenue multiples, 286
reward, risk and, 7
reward/punishment mechanisms, 360-363, 377
Reynolds, S. S., 41
Richardson, M., 124, 212
Rietz, Thomas, 40
risk
categories of, 370-371
defined, 5-7
duality of, 369
history of, 3-5
innovation and, 7-8
measuring. *See* risk assessment
prevalence of, 367-369
reward and, 7
survival and, 3
risk-adjusted discount rates, 101-106
certainty-equivalent cash flows and, 110-116
combining with certainty, 115
implied discount rates for, 104
proxy models for, 102-103
risk-and-return models for, 101-102
risk-adjusted value, 99
combining approaches to, 130
country risk premiums, 132-135
decision trees and, 162-164
discounted cash flow valuation, 99-100
advantages and disadvantages, 116
certainty-equivalent cash flows, 106-111
hybrid models, 111-116
risk-adjusted discount rates, 101-106
post-valuation risk adjustment, 117, 123
control premiums, 126
illiquidity discounts, 118-125, 136-144
limitations of, 127
reasons for using, 117-118
synergy premiums, 127
real options versus, 233-234
relative valuation risk adjustment, 128-130
risk assessment methods and, 180-181
simulations and, 177-178

risk-and-return models
for certainty-equivalent cash flows, 108-109
composite discount rate versus item-specific discount rate, 105
negative cash flows versus positive cash flows, 105-106
for risk-adjusted discount rates, 101-102
single-period models for multiperiod projects, 105
risk-free rate
in decision trees, 162
in risk-and-return models, 101
risk-neutral probability, 56*n*
risk adjustment
in discounted cash flow valuation, 281-282
in relative valuation, 286-287
risk assessment
actuarial tables, 70
in ancient civilizations, 65-66
arbitrage pricing model, 84, 95-96
asymmetric distributions, 81-82
Bayesian statistics, 69-70
CAPM (capital asset pricing model), 77-78, 89-94
comparison of methods, 179-180
decision trees. *See* decision trees
evolution of, 86
insurance, 70-71
jump process distributions, 83
Markowitz approach, 73-77
mean variance framework, challenges to, 78-83
multifactor models, 85-86
normal distributions, 68-69
power-law distributions, 79-81
as principle of risk management, 372-374
probabilities, estimating, 66-68
proxy models, 85-86
real options. *See* real options
risk-adjusted value. *See* risk-adjusted value
sampling, 68
scenario analysis. *See* scenario analysis
simulations. *See* simulations
statistical distributions. *See* statistical distributions
statistical risk measures for financial assets, 71-73
usage of, 181-182
value at risk. *See* VaR
risk aversion
consensus on, 61-63
empirical evidence. *See* empirical evidence
extent of, 38-40
irrational behavior and, 369-370
proportionality in, 359
theories of, 12-28, 35
risk exploitation. *See* **risk taking**
risk hedging, 319
alternative techniques for, 331-339
derivatives, 334-338
financing decisions, 332-333
insurance, 333-334
investment decisions, 331-332
benefits of, 320-326
capital structure, 325
distress costs, 323-324
informational benefits, 325-326
investment decisions, 322-323
tax benefits, 320-322
in conventional definition of risk management, 8
costs of, 319-320
discounted cash flow valuation, effect on, 283-284
in expanded definition of risk management, 9
for increased value, 329-331
option pricing models and, 299-301
as part of risk management, 304-306
prevalence of, 326-329
as principle of risk management, 374-375
in relative valuation, 287, 295-298
risk management versus, 291-294, 303-304
value of, 301-303
riskless assets. *See* **CAPM (capital asset pricing model)**
riskless rate
effect on options, 265
in option to delay (real options), 238
risk management. *See also* **risk taking**
conventional definition of, 8-9
discounted cash flow valuation, effect on, 284-285
expanded definition of, 9
option pricing models and, 301
principles of. *See* principles of risk management
real options in, 260
in relative valuation, 298
risk hedging. *See* risk hedging
risk profiles. *See* risk profiles
strategy development of, 304-306
value of, 303
RiskMetrics service, 204-208
risk profiles
analyzing risks, 318-319
categorizing risks, 310-311
listing risks, 310
measuring risk exposure, 311-318
steps in, 309
risk taking. *See also* **risk management**
advantages for, 345-346
experience in crises, 350-352
flexibility in crises, 353-356
information networks, 346-348
resources in crises, 352-353
speed of response, 348-350
organizational elements for, 356, 377-378
corporate governance structure, 356-358
crisis managers, 358-360
reward/punishment mechanisms, 360-363
size, structure, and culture of organization, 363-365
value and, 342-345
risky asset pricing. *See* **asset pricing**
Roll, R., 85
root nodes (decision trees), 153
Rosenfeld, E. R., 83
Ross, Steve, 84-85
Roth, A. E., 37
Rubinstein, M., 58
Rustrom, E. E., 43

S

Salane, B., 59
sampling, 68
Sarin, A., 124
scenario analysis, 145
best-case/worst-case analysis, 146
comparison with other risk assessment methods, 179-180
decision making, usage in, 151-152
examples of, 148-151
problems with, 152-153
steps in, 147-148
scenario simulations, modifying Monte Carlo simulations, 216
Schafer, William, 42
Scharfstein, D. S., 323
Schraud, C., 325
Schwartz, A., 41
SEC (Securities Exchange Commission), establishment of, 203
sector-specific variable multiples, 286
sector comparisons, 129
Securities Exchange Act, 203
Securities Exchange Commission (SEC), establishment of, 203
selective risk analysis, full risk analysis versus, 179
self-insurance. *See* **insurance**
sequential risk. *See* **decision trees**
Shahabuddin, P., 216
Shapiro, A., 223, 312
Shapiro-Wilk test, 198
Sharpe, Bill, 77
Shehata, Mohamed, 39
short-term focus of VaR, 221
short-term risks, long-term risks versus, 371
Silber, W. L., 123, 139
simplicity of VaR, 221-222
simulations, 164
book value constraints, 174-175
comparison with other risk assessment methods, 179-180
decision making, usage in, 173-174
earnings and cash flow constraints, 175
examples of, 168-173
market value constraints, 176
problems with, 176-177
real options versus, 234
risk-adjusted value and, 177-181
steps in, 164-168
single-period models for multiperiod projects, 105
size of organization, risk taking and, 363-365
skewness, 82
Skiadoupoulous, G., 218, 220
Skintzi, V. D., 220
Sloan, Alfred, 353*n*
small risk
catastrophic risk versus, 311
large risk versus, 370
Smith, C. W., 321, 333
Smith, R. L., 141
Smithson, C., 330
Southwest Airlines
flexibility of, 354
switching options example, 257
SPaR (stock prices at risk), 225
speed of response, 348-350
spice trade, 4
spread, as trading cost, 118
stable Paretian distributions, 80
standard deviations, 68
standardized price, 128
Standard Statistics Bureau, 72
statistical artifacts, 54
statistical controls, 129
statistical distributions, 183
discrete versus continuous data, 183-187
extreme data values, 195-196
limits on data values, 194-195
for probability distributions, 166-167
symmetry of data, 188-189, 192-194
testing for fit, 196-198
statistical risk measures, for financial assets, 71-73
status quo value, 126
Stein, J. C., 225, 323
stock prices at risk (SPaR), 225
strategic risk taking, 9
strike prices (options)
defined, 262
effect on option value, 265
in option to delay (real options), 238
strong law of large numbers, 68*n*
structure of experimental studies, effect on findings, 40-42
Suarez, F., 49
subgroup differences, effect on risk aversion, 42-43, 62
subjective risk, objective risk versus, 5
Summa de Arithmetica **(Pacioli), 66**
survey design, measuring risk aversion, 47-48
survey measures of risk aversion, 47-50
findings, 48-49
quality of, 49-50
survey design, 47-48
survival, risk and, 3
survivor bias, 54
sustainability, real options and, 258
swaps, hedging risks with, 337-338
switching options, option to abandon (real options) and, 256-257
symmetric risks, asymmetric risks versus, 370
symmetry of data, 188-189, 192-194
synergy premiums, 127
Szpiro, George, 48

T

tax benefits of hedging risks, 320-322
taxes, in historical risk premiums, 55
technology companies, risk assessment methods in, 181
Tellis, Gerard, 355
terminal value, 281
testing statistical distributions for fit, 196-198

tests of normality, 198
Thaler, R. H., 41, 44-46
Theory of Investment Value **(Williams), 74**
threat, risk versus, 6
time, effect on equity risk premium, 52-53
time series models, combined with historical simulations, 213
time to expiration, effect on options, 265
Torous, W. N., 83
Toyota, flexibility of, 353
trading costs
- elements of, 118-119
- of private businesses, 120

transactions costs
- liquidation and, 118
- of real assets, 119

transactions exposure, 312
translation exposure, 311-312
treasury bond rate, 51*n*
Treynor, Jack, 77, 119
Tufano, P., 327
Turnbull, S. M., 105
Tversky, A., 35, 41, 43-44

U

uncertainty, risk and, 5, 6
UNCR (Uniform Net Capital Rule), 203
underlying assets, value of
- effect on options, 264
- in option to delay (real options), 237

Uniform Net Capital Rule (UNCR), 203
updating probabilities information, 69-70
upside risks, 126-127. *See also* **duality of risk**
Uryasev, S., 224
Usher, S. E., 225
utility functions
- for certainty-equivalent cash flows, 107-108
- empirical evidence. *See* empirical evidence
- quadratic utility function, 75

V

valuation. *See* **discounted cash flow valuation; relative valuation**
value
- linking to risk management, 375-376
- of options, determining, 264-266
- risk taking and, 342-345

value at risk. *See* **VaR**
value estimates, for option to delay (real options), 237-238
value risk exposure, earnings risk exposure versus, 311-313
Van den Assem, M., 60
VaR (value at risk)
- explained, 201-202
- extensions of, 223-225
- history of, 202-204
- limitations of, 218-223
- measuring, 204
  - *comparison of approaches, 217-218*
  - *historical simulations, 210-214*
  - *Monte Carlo simulations, 214-217*
  - *variance-covariance method, 204-210, 228-230*
- utility as risk assessment tool, 225-226

variables in simulations
- correlation across, 167
- selecting, 164

variance-covariance method
- combining with Monte Carlo simulations, 216
- compared to historical and Monte Carlo simulations, 217-218
- measuring VaR, 204-210, 228-230

variances in asset value
- effect on options, 264
- in option to delay (real options), 237-238

views of risk. *See* **duality of risk**

W

waiting. *See* **option to delay (real options)**
Walt Disney Inc. example
- option to expand (real options), 247-248
- risk exposure measurement, 314-318

Watson, Thomas, 364
weak law of large numbers, 68*n*
wealth, utility functions. *See* **utility functions**
Weibull distributions, 191
Weigelt, K., 41
weighted past, 212
White, A., 208, 214
Whitelaw, R., 212
Who Wants to Be a Millionaire? **(game show), 61**
Wietzman, M., 59
wild randomness, 79
Williams, John Burr, 74
women versus men, effect on risk aversion, 42, 49
Wooders, J., 41
worst-case scenario analysis, 146

X–Z

Yahoo! auctions, eBay auctions versus, 41*n*
Youngen, J., 225
young versus old, effect on risk aversion, 42, 49

Zhu, Yu, 216
Ziemba, W. T., 58
Zoulis, Y., 218