



Real Options Analysis, 2nd Edition: Tools and Techniques for Valuing Strategic Investments & Decisions

Dr. Johnathan Mun

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Keyword: JOHNATHAN MUN

Real Options Analysis, 2nd edition provides a novel view of evaluating capital investment strategies by taking into consideration the strategic decision-making process. The book provides a qualitative and quantitative description of real options, the methods used in solving real options, why and when they are used, and the applicability of these methods in decision making. In addition, multiple business cases and real-life applications are discussed. This includes presenting and framing the real options problems, as well as introducing a stepwise quantitative process developed by the author for solving these problems using the different methodologies inherent in real options. Included are technical presentations of models and approaches used as well as their theoretical and mathematical justifications. The book is divided into three parts: the qualitative discussions of real options; the quantitative analysis and mathematical concepts; and practical applications. The first part looks at the qualitative nature of real options, providing actual business cases and scenarios of real options in the industry, as well as high-level explanations of how real options provide the much-needed insights in decision making. The second part of the book looks at the step-by-step quantitative analysis, complete with worked-out examples and mathematical formulae. The third part illustrates the use of the Real Options Valuation's Super Lattice Solver software and Risk Simulator software both developed by the author and included in the enclosed CD-ROM (standard 30-day trial with extended academic license). In this section, more detailed business cases are solved using the software.

This second edition provides many updates including:

- A trial version and introduction to the Super Lattice Solver software that supersedes the author's older Real Options Analysis Toolkit software (all bugs and computational errors have been fixed and verified).
- A trial version and introduction to the Risk Simulator software also created by the author.
- Extended examples and step-by-step computations of American, Bermudan, European, and Customized options (including abandon, barrier, chooser, contraction, expansion, and other options).
- More extensive coverage of advanced and exotic real and financial options (multiple-phased sequential compound options, complex sequential compound option, barrier options, trinomial mean-reverting options, quadrinomial jump-diffusion options, pentanomial dual-asset rainbow options, multiple-asset with multiple-phased options, engineering your own exotic options, and so forth).
- Extended real options cases with step-by-step worked out solutions using the Super Lattice Solver software.
- Several brand new case studies on applying real options in the industry.
- An extended discussion on volatility estimates, risk, and uncertainty.

This book is targeted at both the uninitiated professional as well as those well-versed in real options applications. It is also applicable for use as a second-year M.B.A. level textbook or introductory Ph.D. reference book.

ABOUT THE AUTHOR

Dr. Johnathan C. Mun is the founder and CEO of Real Options Valuation, Inc., a consulting, training, and software development firm specializing in real options, employee stock options, financial valuation, simulation, forecasting, optimization, and risk analysis located in northern California. He is the creator of the Super Lattice Solver software, Risk Simulator software, and Employee Stock Options Valuation software at the firm. The Super Lattice Solver software showcased in this book supersedes the previous Real Options Analysis Toolkit software which he also developed. He has also authored numerous other books including Real Options Analysis Course: Business Cases (Wiley 2003), Applied Risk Analysis: Moving Beyond Uncertainty (Wiley 2003), Valuing Employee Stock Options (Wiley 2004), Modeling Risk: Applying Monte Carlo Simulation, Real Options Analysis, Forecasting, and Optimization (Wiley 2006), and others. His books and software are being used around the world at top universities (including the Bern Institute in Germany, Chung-Ang University in South Korea, Georgetown University, ITESM in Mexico, Massachusetts Institute of Technology, New York University, Stockholm University in Sweden, University of the Andes in Chile, University of Chile, University of Pennsylvania Wharton School, University of York in the United Kingdom, and Edinburgh University in Scotland, etc).

Dr. Mun is also currently a finance and economics professor and has taught courses in financial management, investments, real options, economics, and statistics at the undergraduate and the graduate M.B.A. levels. He is teaching and has taught at universities all over the world, from the U.S. Naval Postgraduate School (Monterey, California) and University of Applied Sciences (Switzerland and Germany) to Golden Gate University (California) and St. Mary's

College (California), and has chaired many graduate research thesis committees. He was formerly the Vice President of Analytics at Decisioneering, Inc. where he headed up the development of real options and financial analytics software products, analytical consulting, training, and technical support, and where he was the creator of the Real Options Analysis Toolkit software, the older predecessor of the Super Lattice Software discussed in this book.

Dr. Mun received his Ph.D. in Finance and Economics from Lehigh University, where his research and academic interests were in the areas of Investment Finance, Econometric Modeling, Financial Options, Corporate Finance, and Microeconomic Theory. He also has an M.B.A. in business administration, an M.S. in management science, and a B.S. in Biology and Physics. He is Certified in Financial Risk Management (FRM), Certified in Financial Consulting (CFC), and is Certified in Risk Analysis (CRA). Finally, he has written many academic articles published in the Journal of the Advances in Quantitative Accounting and Finance, the Global Finance Journal, the International Financial Review, the Journal of Financial Analysis, the Journal of Applied Financial Economics, the Journal of International Financial Markets, Institutions and Money, the Financial Engineering News, and the Journal of the Society of Petroleum Engineers.

PRAISES FOR REAL OPTIONS ANALYSIS

"...this book is a *must have* and *must read*... Dr. Mun's new book is a refreshing, cutting-edge look at a powerful new decision-making process... it isn't often you can truthfully say a book breaks new ground, but [this book] has certainly done that."

-Glenn G. Kautt, *President, Monitor Group, Inc. (USA)*

"Many books on real options can be intimidating. Dr. Mun offers a pragmatic, reliable and entertaining guide. Complex concepts and formulas are brilliantly interspersed with well chosen examples and step-by-step walk through from a variety of industries."

-Shota Hattori, *President and CEO, Koza Engineering, (Japan)*

"Real Options Analysis is the clearest book on real options that we have read to date. It does an excellent job of demystifying a difficult and complex subject. It provides a solid basis for conceiving, assessing and evaluating real option investments, which will make it useful to practitioners and students alike."

-Ian C. MacMillan, *Professor*

The Wharton School of the University of Pennsylvania (USA)

"...the clarity and comprehensive coverage makes it the best guide for all practitioners... coupled with state-of-the-art financial tools CD-ROM."

-Michael Sim, *Partner, Moores Rowland International (Hong Kong)*

"Dr. Johnathan Mun certainly has earned the reputation of being an expert on the subject... consultants, analysts, decision-makers and engineers will be all over this book and its software."

-Phyllis Koessler, *Managing Director, Koessler and Associates (Switzerland)*

"...finally, a real options analysis book that is technically sophisticated enough to be useful, and practically written so that it can actually be used. It is destined to become the handbook of real options."

-Tracy Gomes, *CEO, Intellectual Property Economics (USA)*

"Dr. Mun demystifies real options analysis and delivers a powerful, pragmatic guide for decision-makers and practitioners alike. Finally, there is a book that equips professionals to easily recognize, value, and seize real options in the world around them."

-Jim Schreckengast, *Sr. Vice President, R&D Strategy – Gemplus International SA (France)*

"...written from the viewpoint of an educator and a practitioner, his book offers a readable reference full of insightful decision-making tools to satisfy both the novice and the experienced veteran."

-Richard Kish, *Ph.D., Associate Professor of Finance, Lehigh University (USA)*

"Dr. Mun has converted his tacit financial knowledge into a digestible user-friendly book. He effectively leads the reader on a solid path starting from *discounted cash flow*, progressing through *Monte Carlo analysis* and evolving to *real options* to get even closer to the target of achieving confident corporate decisions. His ability to clearly explain the relationships of popular competing analysis methods will make this a must have reference book for today's decision makers."

-Ken English, *Director of R&D, The Timken Company (USA)*

"The book leads the field in real options analytics and is a must-read for anyone interested in performing such analyses. Dr. Mun has made a formidable subject crystal clear and exponentially easy for senior management to understand. *Monte Carlo simulation* and *real options* software alone is worth the book price many times over."

-Morton Glantz, *Renowned educator in finance, author of several books, financial advisor to government (USA)*

TABLE OF CONTENTS

Chapter One: A New Paradigm?

Expansion and Compound Options: The Case of the Operating System
Expansion Options: The Case of the e-Business Initiative
Expansion and Sequential Options: The Case of the Pharma R&D
Expansion and Switching Options: The Case of the Oil and Gas Exploration and Production
Abandonment Options: The Case of the Manufacturer
Expansion and Barrier Options: The Case of the Lost Venture Capitalist
Compound Expansion Options: The Case of the Internet Start-up
The Real Options Solution
Issues to Consider
Industry Leaders Embracing Real Options
Automobile and Manufacturing Industry, Computer Industry, Airline Industry, Oil and Gas Industry, Telecommunications Industry, Utilities Industry, Real Estate Industry, Pharmaceutical Research and Development Industry, High-Tech and e-Business Industry, Mergers and Acquisition
What the Experts Are Saying
Criticisms, Caveats, and Misunderstandings in Real Options
Appendix 1A – Timken Company on Real Options in R&D Manufacturing
Appendix 1B – Schlumberger on Real Options in Oil and Gas
Appendix 1C – Intellectual Property Economics on Real Options in Patent and Intangible Valuation
Appendix 1D – Gemplus on Real Options in High-Tech R&D

Chapter Two: Traditional Valuation Approaches

Practical Issues Using Traditional Valuation Methodologies
Appendix 2A – Financial Statement Analysis
Appendix 2B – Discount Rate versus Risk-Free Rate

Chapter Three: The Fundamental Essence of Real Options

The Basics of Real Options
A Simplified Example of Real Options in Action
Advanced Approaches to Real Options
Why Are Real Options Important?
Comparing Traditional Approaches with Real Options

Chapter Four: The Real Options Process

Critical Steps in Performing Real Options
Qualitative Management Screening
Time-Series and Regression Forecasting
Base Case Net Present Value Analysis
Monte Carlo Simulation
Real Options Problem Framing
Real Options Modeling and Analysis
Portfolio and Resource Optimization
Reporting and Update Analysis

Chapter Five: Options and Monte Carlo Simulation

Real Options versus Financial Options
Monte Carlo Simulation

Chapter Six: Behind the Scenes

Real Options: Behind the Scenes
Binomial Lattices
The Look and Feel of Uncertainty
A Firm's Real Options Provide Value in the Face of Uncertainty
Binomial Lattices as a Discrete Simulation of Uncertainty
Risk versus Uncertainty, Volatility versus Discount Rates
Risk versus Uncertainty
Discount Rates
Hard Options versus Soft Options: Adjusting for Nonmarketability of Real Options
Granularity Leads to Precision
An Intuitive Look at the Binomial Equations
Frolicking in a Risk-Neutral World

Chapter Seven: Real Options Models

Option to Abandon, Option to Expand, Option to Contract
Option to Choose, Simultaneous Compound Options, Changing Strikes, Changing Volatility, Sequential Compound Option
Extension to the Binomial Models
Appendix 7A – Volatility Estimates
Appendix 7B – Black-Scholes in Action
Appendix 7C – Binomial Path-Dependent and Market-Replicating Portfolios
Risk-Neutral Probability Approach versus Market Replicating Approach
Appendix 7D – Single-State Static Binomial Example
Appendix 7E – Sensitivity Analysis
Appendix 7F – Reality Checks
Appendix 7G – Applying Monte Carlo Simulation to Solve Real Options
Appendix 7H – Trinomial Lattices
Appendix 7I – Nonrecombining Lattices

Chapter Eight: Additional Issues in Real Options

Project Ranking, Valuation, and Selection
Decision Trees, Exit and Abandonment Options, Compound Options
Timing Options, Solving Timing Options Calculated Using Stochastic Optimization, Switching Options
Appendix 8A – Stochastic Processes
Appendix 8B – Differential Equations for a Deterministic Case
Appendix 8C – Exotic Options Formulae

Chapter Nine: Real Options Valuation's Super Lattice Software

Introduction to the Real Option Super Lattice Solver Software
Single Super Lattice Solver (SSLS)
Multiple Super Lattice Solver (MSLS)
Multinomial Lattice Solver
SLS Excel Solution (SSLS, MSLS and Changing Volatility in Excel)
SLS Functions
RISK SIMULATOR SOFTWARE
MONTE CARLO SIMULATION: What is Monte Carlo Simulation?
Getting Started with Risk Simulator
Understanding the Forecast Statistics
FORECASTING: Different Types of Forecasting Techniques
Running the Forecasting Tool in Risk Simulator
OPTIMIZATION
Appendix 9A – Financial Options
Appendix 9B – Simulation
Appendix 9C – Forecasting
Appendix 9D – Optimization

Chapter Ten: Real Options Valuation Application Cases

American, European, Bermudan, and Customized Abandonment Option
American, European, Bermudan, and Customized Contraction Option
American, European, Bermudan, and Customized Expansion Option
Contraction, Expansion, and Abandonment Option
Basic American, European, and Bermudan Call Options
Basic American, European, and Bermudan Put Options
Exotic Chooser Options, Sequential Compound Options
Multiple-Phased Sequential Compound Option
Customized Sequential Compound Options
Path-Dependence, Path Independence, Mutually Exclusive, Non-Mutually Exclusive, and Complex Combinatorial Nested Options
Simultaneous Compound Option
American and European Options (Trinomial Lattices)
American and European Mean-Reversion Option (Trinomial Lattices)
Jump-Diffusion Option (Quadrinomial Lattices)
Dual Variable Rainbow Option Using Pentanomial Lattices
American and European Lower Barrier Options
American and European Upper Barrier Option
American and European Double Barrier Options and Exotic Barriers
American ESO with Vesting Period
Changing Volatilities and Risk-free Rates Options
American ESO with Suboptimal Exercise Behavior
American ESO with Vesting and Suboptimal Exercise Behavior
American ESO with Vesting, Suboptimal Exercise Behavior, Blackout Periods, and Forfeiture Rate

Chapter Eleven: Real Options Case Studies

Case I: High-Tech Manufacturing—Build or Buy Decision
Case II: Financial Options—Convertible Warrants, Vesting, Put Protection
Case III: Pharmaceutical Development—Value of Perfect Information and Optimal Trigger Values
Case IV: Oil and Gas—Farm Outs, Options to Defer, Value of Info
Case V: Valuing Employee Stock Options Under 2004 FAS 123
Case VI: Integrated Risk Analysis Model—How to Combine Simulation, Forecasting, Optimization, Real Options into a Seamless Risk Model
Case VII: Biopharmaceutical Industry—Strategic Manufacturing Flexibility
Case VIII: Alternative Uses for a Proposed Real Estate Development
Case IX: Naval Special Warfare Group One's Mission Support Center

Chapter Twelve: Results Interpretation and Presentation

Comparing Real Options Analysis with Traditional Financial Analysis
The Evaluation Process
Summary of the Results
Comparing across Different-Sized Projects
Comparing Risk and Return of Multiple Projects
Impact to Bottom Line
Critical Success Factors and Sensitivity Analysis
Risk Analysis and Simulation on NPV
Break-Even Analysis and Payback Periods
Discount Rate Analysis
Real Options Analysis Assumptions
What Are the Next Steps?
Appendix 10A – Summary of Articles