ROV MODELING TOOLKIT 2011
Boîte à Outils de Modélisation 2011

Real Options Valuation, Inc. est fier de présenter sa dernière innovation, la boîte à outils de modélisation (édition PLATINUM). Cette boîte à outils comprend plus de 800 modèles, fonctions et outils analytiques, et environ 300 modèles et exemples Excel/SLS de modèles analytiques couvrant les domaines de l'analyse des risques, de la simulation, des prévisions, de l'analyse des risques Bâle II, des risques de crédit et de défaut, des modèles statistiques et bien davantage ! Cette boîte à outils est composée de modèles mathématiques sophistiqués écrits en C++ et reliés à des feuilles de calcul Excel. Elle comprend plus de 1 100 modèles et fonctions avec des feuilles de calcul et des modèles SLS et les domaines analytiques couverts incluent:

- Analytics
- Banking Models
- Credit Analysis
- Debt Analysis
- Decision Analysis
- Exotic Options
- Forecasting
- Industry Applications
- Optimization
- Options Analysis
- Probability of Default
- Project Management
- Real Options SLS
- Risk Analysis
- Risk Hedging
- Sensitivity
- Simulation
- Six Sigma
- Valuation
- Value at Risk
- Volatility

Real Options Valuation Inc

Real Options Valuation, Inc. 4101-F Dublin Blvd., Suite 425, Dublin, CA 94568 USA +1.925.271.4438 www.realoptionsvaluation.com

ROV MODELING TOOLKIT: (Boîte à outils de modélisation)
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Analytics: Central Limit Theorem, Central Limit Theorem (Lottery Analysis), Flaw of Averages, Mathematical Integration, Parametric and Nonparametric Hypothesis Tests Dataset, Projectile Motion, Regression Diagnostics, Ships in the Night, Statistical Analysis, Weighting of Ratios

Banking Models: Audit of Construction Lending, Banker's Construction Budget, Classified Breakeven Loan Inventory, Classified Loan Borrowing Base, Classified Loan Cash Budget and Overdraft Facilities, Federal Reserve Camels Rating System, Firm in Financial Distress, Project Finance Risk Rating Model, Queuing Models, Reconciling Enron's Cash Flow, Risk Rating Model, Sample Cash Flows, Sensitivity Projections, Stochastic Loan Pricing Model, Valuation and Appraisal

Credit Analysis: Credit Default Swaps and Credit Spread Options, Credit Default Swaps (with Counterparty Defaults and Correlations), Credit Premium, Credit Risk and Effects on Prices, External Debt Rating and Spreads, Internal Credit Risk Rating Model, Profit Cost Analysis of New Credit, Debt Analysis, Asset Equity Parity Model, Cox Model on Price and Yield of Risky Debt with Mean Reverting Rates, Debt Repayment and Amortization, Debt Sensitivity Models, Merton Price of Risky Debt with Stochastic Asset and Interest, Vasicek Debt Option Valuation, Vasicek Price and Yield of Risky Debt

Decision Analysis: Decision Tree Basics, Decision Tree with EVPI, Minimax and Bayes Theorem, Economic Order Quantity and Inventory Reorder Point, Economic Order Quantity and Optimal Manufacturing, Expected Utility Analysis, Inventory Control, Queuing Models

Exotic Options: American, Bermudan and European Options, Asian Arithmetic, Asian Geometric, Asset or Nothing, Barrier Options, Binary Digital Options, Cash or Nothing, Commodity Options, Complex Chooser, Credit Spread Options, Currency Options, Double Barriers, Exchange Assets, Extreme Spread, Foreign Equity Linked Forex, Foreign Equity Domestic Currency, Foreign Equity Fixed Forex, Foreign Takeover Options, Forward Start, Futures and Forward Options, Gap Options, Graduated Barriers, Index Options, Inverse Gamma Out-of-the-money Options, Jump Diffusion, Leptokurtic and Skewed Options, Lookback Fixed Strike Partial Time, Lookback Fixed Strike, Lookback Floating Strike Partial Time, Lookback Floating Strike, Min and Max of Two Assets, Option Collar, Options on Options, Perpetual Options, Simple Chooser, Spread on Futures, Supershares, Time Switch, Trading Day Corrections, Two Assets Barrier, Two Assets Cash, Two Assets Correlated, Uneven Dividends, Writer Extendible

Forecasting: Brownian Motion Stochastic Process, Data Diagnostics, Econometric, Correlations and Multiple Regression Modeling, Exponential J-Growth Curves, Forecasting Manual Computations, Jump-Diffusion Stochastic Process, Linear Interpolation, Logistic S-Growth Curves, Markov Chains and Market Share, Mean-Reverting Stochastic Process, Multiple Regression, Nonlinear Extrapolation, Stochastic Processes and Yield Curves, Stock Distribution at Horizon, Time-Series Analysis, Time-Series ARIMA

Industry Applications: Asset Liability Management ALM, Biotech: Manufacturing Strategy, Biotech-In-licensing and Deal Structuring, Biotech: Investment Valuation, Electric Utility: Efficient Frontier Generation, Electric Utility: Electricity Contract Risk, Information Technology: Forecasting Use, Information Technology: Decision Analysis, Pensions: Closed Group Portfolio Matching, Pensions: Accounting Modeling and Optimization, Real Estate: Commercial ROI

Optimization: Capital Investments (Part A), Capital Investments (Part B), Continuous Portfolio Allocation, Discrete Project Selection, Inventory Optimization, Investment Portfolio Allocation, Military Portfolio and Efficient Frontier, Optimal Pricing with Elasticity, Optimization of a Harvest Model, Optimizing Ordinary Least Squares, Stochastic Portfolio Allocation

Options Analysis: Binary Digital Instruments, Inverse Floater Bond Lattice Maker, Options Adjusted Spreads on Debt, Options on Debt, Options Trading Strategies

Probability of Default: Empirical (Individuals), External Options Model (Public Company), Merton Internal Model (Private Company), Merton Market Options Model (Industry Comparable), Yields and Spreads (Market Comparable)

Project Management: Cost Estimation Model, Critical Path Analysis (CPM PERT GANTT), Project Timing

Real Options SLS: Employee Stock Options: Simple American Call, Employee Stock Options: Simple Bermudan Call with Vesting, Employee Stock Options: Simple European Call, Employee Stock Options: Suboptimal Exercise, Employee Stock Options: Vesting and Suboptimal Exercise, Employee Stock Options: Vesting, Blackout, Suboptimal, Forfeiture

Exotic Options: American Call Option with Dividends, Exotic Options: Accruals on Basket of Assets, Exotic Options: American Call Option on Foreign Exchange, Exotic Options: American Call Option on Index Futures, Exotic Options: Barrier Option: Down and In Lower Barrier, Exotic Options: Barrier Option: Down and Out Lower Barrier, Exotic Options: Barrier Option: Up and In Upper Barrier Call, Exotic Options: Barrier Option: Up and In, Down and In Double Barrier Call, Exotic Options: Barrier Option: Up and Out Upper Barrier Call, Exotic Options: Barrier Option: Up and Out, Down and Out Double Barrier Call, Exotic Options: Basic American, European, versus Bermudan Call Options, Exotic Options: Chooser Option, Exotic Options: Equity Linked Notes, Exotic Options: European Call Option with Dividends, Exotic Options: Range Accruals

Options Analysis: Plain Vanilla Call Option I, Options Analysis: Plain Vanilla Call Option II, Options Analysis: Plain Vanilla Call Option III, Options Analysis: Plain Vanilla Call Option IV, Options Analysis: Plain Vanilla Put Option

Real Options: Abandonment American Option, Real Options: Abandonment Bermudan Option, Real Options: Abandonment Customized Option, Real Options: Abandonment European Option, Real Options: Contraction American and European Option, Real Options: Contraction Bermudan Option, Real Options: Contraction Customized Option, Real Options: Dual-Asset Rainbow Option Pentanomial Lattice, Real Options: Excel-based Options Models, Real Options: Exotic Complex Floating American Chooser, Real Options: Exotic Complex Floating European Chooser, Real Options: Expand Contract Abandon American and European Option, Real Options: Expand Contract Abandon Bermudan Option, Real Options: Expand Contract Abandon Customized Option I, Real Options: Expand Contract Abandon Customized Option II, Real Options: Expansion American and European Option, Real Options: Expansion Bermudan Option, Real Options: Expansion Customized Option, Real Options: Jump Diffusion Calls and Puts using Quadranomial Lattices, Real Options: Mean Reverting Calls and Puts using Trinomial Lattices, Real Options: Multiple Asset Competing Options (3D Binomial), Real Options: Multiple Phased Complex Sequential Compound Option, Real Options: Multiple Phased Sequential Compound Option, Real Options: Multiple Phased Simultaneous Compound Option, Real Options: Simple Calls and Puts using Trinomial Lattices, Real Options: Simple Two Phased Sequential Compound Option, Real Options: Simple Two Phased Simultaneous Compound Option, Real Options: Strategic Cases: High: Tech Manufacturing Strategy A, Real Options: Strategic Cases: High-Tech Manufacturing Strategy B, Real Options: Strategic Cases: High-Tech Manufacturing Strategy C, Real Options: Strategic Cases: Oil and Gas: Strategy A, Real Options: Strategic Cases: Oil and Gas: Strategy B, Real Options: Strategic Cases: R&D Stage-Gate Process A, Real Options: Strategic Cases: R&D Stage-Gate Process B, Real Options: Strategic Cases: Switching Option's Strategy A, Real Options: Strategic Cases: Switching Option's Strategy B

Trinomial Lattices: American Call Option, Trinomial Lattices: American Put Option, Trinomial Lattices: European Call Option, Trinomial Lattices: European Put Option, Trinomial Lattices: Mean Reverting American Call Option, Trinomial Lattices: Mean Reverting American Put Option, Trinomial Lattices: Mean Reverting European Call Option, Trinomial Lattices: Mean Reverting European Put Option, Trinomial Lattices: Mean Reverting American Abandonment Option, Trinomial Lattices: Mean Reverting American Contraction Option, Trinomial Lattices: Mean Reverting American Expansion Option, Trinomial Lattices: Mean Reverting American Abandonment, Contraction, Expansion, Trinomial Lattices: Mean Reverting Bermudan Abandonment, Contraction, Expansion, Trinomial Lattices: Mean Reverting Abandonment, Contraction, Expansion, Trinomial Lattices: Mean Reverting European Abandonment, Contraction, Expansion

Quadranomial Lattices: Jump Diffusion American Call Option, Quadranomial Lattices: Jump Diffusion American Put Option, Quadranomial Lattices: Jump Diffusion European Call Option, Quadranomial Lattices: Jump Diffusion European Put Option

Pentanomial Lattices: American Rainbow Call Option, Pentanomial Lattices: American Rainbow Put Option, Pentanomial Lattices: Dual Reverse Strike American Call (3D Binomial), Pentanomial Lattices: Dual Reverse Strike American Put (3D Binomial), Pentanomial Lattices: Dual Strike American Call (3D Binomial), Pentanomial Lattices: Dual Strike American Put (3D Binomial), Pentanomial Lattices: European Rainbow Call Option, Pentanomial Lattices: European Rainbow Put Option, Pentanomial Lattices: Exchange of Two Assets American Put (3D Binomial), Pentanomial Lattices: Maximum of Two Assets American Call (3D Binomial), Pentanomial Lattices: Maximum of Two Assets American Put (3D Binomial), Pentanomial Lattices: Minimum of Two Assets American Call (3D Binomial), Pentanomial Lattices: Minimum of Two Assets American Put (3D Binomial), Pentanomial Lattices: Portfolio American Call (3D Binomial), Pentanomial Lattices: Portfolio American Put (3D Binomial), Pentanomial Lattices: Spread of Two Assets American Call (3D Binomial), Pentanomial Lattices: Spread of Two Assets American Put (3D Binomial)

Risk Analysis: Integrated Risk Analysis, Interest Rate Risk, Portfolio Risk and Return Profile

Risk Hedging: Delta Gamma Hedge, Delta Hedge, Effects of Fixed versus Floating Rates, Foreign Exchange Cash Flow Model, Foreign Exchange Exposure Hedging

Sensitivity: Greeks, Tornado and Sensitivity Charts Linear, Tornado and Sensitivity Nonlinear

Simulation: Basic Simulation Model, Best Surgical Team, Correlated Simulation, Correlation Effects Model, Data Fitting, DCF, ROI and Volatility, Debt Repayment and Amortization, Demand Curve and Elasticity Estimation, Infectious Diseases, Recruitment Budget (Negative Binomial and Multidimensional Simulation), Retirement Funding with VBA Macros, Roulette Wheel, Time Value of Money

Six Sigma: Confidence Intervals with Hypothesis Testing, Control Charts (c, n, p, u, X, XmR, R), Delta Precision, Design of Experiments and Combinatorics, Hypothesis Testing and Bootstrap Simulation, Sample Size Correlation, Sample Size DPU, Sample Size Mean, Sample Size Proportion, Sample Size Sigma, Statistical Analysis (CDF, PDF, ICDF) with Hypothesis Testing, Statistical Capability Measures, Unit Capability Measures

Valuation: APT, BETA and CAPM, Buy versus Lease, Caps and Floors, Convertible Bonds, Financial Ratios Analysis, Financial Statements Analysis, Valuation Model, Valuation: Warrant Combined Value, Valuation: Warrant Put Only, Valuation: Warrant Only

Value at Risk: Optimized and Simulated Portfolio VaR, Options Delta Portfolio, Portfolio Operational and Capital Adequacy, Right Tail Capital Requirements, Static Covariance Method

Volatility: EWMA Volatility Models, GARCH Volatility Models, Implied Volatility, Log Asset Returns Approach, Log Cash Flow Returns Approach Probability to Volatility

Yield Curve: CIR Model, Curve Interpolation BIM, Curve Interpolation NS, Forward Rates from Spot Rates, Spline Interpolation and Extrapolation, Term Structure of Volatility, US Treasury Risk Free Rate, Vasicek Model

Real Options Valuation

MODELING TOOLKIT

Real Options Valuation, Inc. is proud to present its latest innovation, the **Modeling Toolkit (Premium Edition)**. This toolkit comprises over 800 analytical models, functions and tools, and about 300 analytical model Excel/SLS templates and example spreadsheets covering the areas of risk analysis, simulation, forecasting, Basel II risk analysis, credit and default risk, statistical models, and much more! This toolkit is a set of mathematically sophisticated models written in C++ and linked into Excel spreadsheets. There are over 1100 models, functions, with spreadsheet and SLS templates in this toolkit and the analytical areas covered include:

Analytics

1. **Central Limit Theorem**
2. **Central Limit Theorem (Lottery Analysis)**
3. **Flaw of Averages**
4. **Mathematical Integration**
5. **Parametric and Nonparametric Hypothesis Tests Dataset**
6. **Projectile Motion**
7. **Regression Diagnostics**
8. **Ships in the Night**
9. **Statistical Analysis**
10. **Weighting of Ratios**

Banking Models

11. **Audit of Construction Lending**
12. **Banker's Construction Budget**
13. **Classified Breakeven Loan Inventory**
14. **Classified Loan Borrowing Base**
15. **Classified Loan Cash Budget and Overdraft Facilities**
16. **Federal Reserve Camels Rating System**
17. **Firm in Financial Distress**
18. **Project Finance Risk Rating Model**
19. **Queuing Models**
20. **Reconciling Enron's Cash Flow**
21. **Risk Rating Model**
22. **Sample Cash Flows**
23. **Sensitivity Projections**
24. **Stochastic Loan Pricing Model**
25. **Valuation and Appraisal**

Credit Analysis

26. **Credit Default Swaps and Credit Spread Options**
27. **Credit Default Swaps (with Counterparty Defaults and Correlations)**
28. **Credit Premium**
29. **Credit Risk and Effects on Prices**
30. **External Debt Rating and Spreads**
31. **Internal Credit Risk Rating Model**
32. **Profit Cost Analysis of New Credit**

Debt Analysis

33. **Asset Equity Parity Model**
34. **Cox Model on Price and Yield of Risky Debt with Mean Reverting Rates**
35. **Debt Repayment and Amortization**
36. **Debt Sensitivity Models**
37. **Merton Price of Risky Debt with Stochastic Asset and Interest**
38. **Vasicek Debt Option Valuation**
39. **Vasicek Price and Yield of Risky Debt**

Decision Analysis

40. **Decision Tree Basics**
41. **Decision Tree with EVPI, Minimax and Bayes Theorem**
42. **Economic Order Quantity and Inventory Reorder Point**
43. **Economic Order Quantity and Optimal Manufacturing**
44. **Expected Utility Analysis**
45. **Inventory Control**
46. **Queuing Models**

Exotic Options

47. **American, Bermudan and European Options**
48. **Asian Arithmetic**
49. **Asian Geometric**
50. **Asset or Nothing**
51. **Barrier Options**
52. **Binary Digital Options**
53. **Cash or Nothing**
54. **Commodity Options**
55. **Complex Chooser**
56. **Credit Spread Options**

57. **Currency Options**
58. **Double Barriers**
59. **Exchange Assets**
60. **Extreme Spread**
61. **Foreign Equity Linked Forex**
62. **Foreign Equity Domestic Currency**
63. **Foreign Equity Fixed Forex**
64. **Foreign Takeover Options**
65. **Forward Start**
66. **Futures and Forward Options**
67. **Gap Options**
68. **Graduated Barriers**
69. **Index Options**
70. **Inverse Gamma Out-of-the-money Options**
71. **Jump Diffusion**
72. **Leptokurtic and Skewed Options**
73. **Lookback Fixed Strike Partial Time**
74. **Lookback Fixed Strike**
75. **Lookback Floating Strike Partial Time**
76. **Lookback Floating Strike**
77. **Min and Max of Two Assets**
78. **Option Collar**
79. **Options on Options**
80. **Perpetual Options**
81. **Simple Chooser**
82. **Spread on Futures**
83. **Supershares**
84. **Time Switch**
85. **Trading Day Corrections**
86. **Two Assets Barrier**
87. **Two Assets Cash**
88. **Two Assets Correlated**
89. **Uneven Dividends**
90. **Writer Extendible**

Forecasting

91. **Brownian Motion Stochastic Process**
92. **Data Diagnostics**
93. **Econometric, Correlations and Multiple Regression Modeling**
94. **Exponential J-Growth Curves**
95. **Forecasting Manual Computations**

96. **Jump-Diffusion Stochastic Process**
97. **Linear Interpolation**
98. **Logistic S-Growth Curves**
99. **Markov Chains and Market Share**
100. **Mean-Reverting Stochastic Process**
101. **Multiple Regression**
102. **Nonlinear Extrapolation**
103. **Stochastic Processes and Yield Curves**
104. **Stock Distribution at Horizon**
105. **Time-Series Analysis**
106. **Time-Series ARIMA**

Industry Applications

107. **Asset Liability Management ALM**
108. **Biotech – Manufacturing Strategy**
109. **Biotech – In-licensing and Deal Structuring**
110. **Biotech – Investment Valuation**
111. **Electric Utility – Efficient Frontier Generation**
112. **Electric Utility – Electricity Contract Risk**
113. **Information Technology – Forecasting Use**
114. **Information Technology – Decision Analysis**
115. **Pensions – Closed Group Portfolio Matching**
116. **Pensions – Accounting Modeling and Optimization**
117. **Real Estate – Commercial ROI**

Optimization

118. **Capital Investments (Part A)**
119. **Capital Investments (Part B)**
120. **Continuous Portfolio Allocation**
121. **Discrete Project Selection**
122. **Inventory Optimization**
123. **Investment Portfolio Allocation**
124. **Military Portfolio and Efficient Frontier**
125. **Optimal Pricing with Elasticity**
126. **Optimization of a Harvest Model**
127. **Optimizing Ordinary Least Squares**
128. **Stochastic Portfolio Allocation**

Options Analysis

129. **Binary Digital Instruments**
130. **Inverse Floater Bond Lattice Maker**
131. **Options Adjusted Spreads on Debt**
132. **Options on Debt**
133. **Options Trading Strategies**

Probability of Default

134. **Empirical (Individuals)**
135. **External Options Model (Public Company)**
136. **Merton Internal Model (Private Company)**
137. **Merton Market Options Model (Industry Comparable)**
138. **Yields and Spreads (Market Comparable)**

Project Management

139. **Cost Estimation Model**
140. **Critical Path Analysis (CPM PERT GANTT)**
141. **Project Timing**

Real Options SLS

142. **Employee Stock Options - Simple American Call**
143. **Employee Stock Options - Simple Bermudan Call with Vesting**
144. **Employee Stock Options - Simple European Call**
145. **Employee Stock Options - Suboptimal Exercise**
146. **Employee Stock Options - Vesting and Suboptimal Exercise**
147. **Employee Stock Options - Vesting, Blackout, Suboptimal, Forfeiture**
148. **Exotic Options - American Call Option with Dividends**
149. **Exotic Options - Accruals on Basket of Assets**
150. **Exotic Options - American Call Option on Foreign Exchange**
151. **Exotic Options - American Call Option on Index Futures**
152. **Exotic Options - Barrier Option - Down and In Lower Barrier**
153. **Exotic Options - Barrier Option - Down and Out Lower Barrier**
154. **Exotic Options - Barrier Option - Up and In Upper Barrier Call**
155. **Exotic Options - Barrier Option - Up and In, Down and In Double Barrier Call**
156. **Exotic Options - Barrier Option - Up and Out Upper Barrier Call**
157. **Exotic Options - Barrier Option - Up and Out, Down and Out Double Barrier Call**
158. **Exotic Options - Basic American, European, versus Bermudan Call Options**
159. **Exotic Options - Chooser Option**
160. **Exotic Options - Equity Linked Notes**
161. **Exotic Options - European Call Option with Dividends**
162. **Exotic Options - Range Accruals**

163. **Options Analysis - Plain Vanilla Call Option I**
164. **Options Analysis - Plain Vanilla Call Option II**
165. **Options Analysis - Plain Vanilla Call Option III**
166. **Options Analysis - Plain Vanilla Call Option IV**
167. **Options Analysis - Plain Vanilla Put Option**

168. **Real Options - Abandonment American Option**
169. **Real Options - Abandonment Bermudan Option**
170. **Real Options - Abandonment Customized Option**
171. **Real Options - Abandonment European Option**
172. **Real Options - Contraction American and European Option**
173. **Real Options - Contraction Bermudan Option**
174. **Real Options - Contraction Customized Option**
175. **Real Options - Dual-Asset Rainbow Option Pentanomial Lattice**
176. **Real Options – Excel-based Options Models**
177. **Real Options - Exotic Complex Floating American Chooser**
178. **Real Options - Exotic Complex Floating European Chooser**
179. **Real Options - Expand Contract Abandon American and European Option**
180. **Real Options - Expand Contract Abandon Bermudan Option**
181. **Real Options - Expand Contract Abandon Customized Option I**
182. **Real Options - Expand Contract Abandon Customized Option II**
183. **Real Options - Expansion American and European Option**
184. **Real Options - Expansion Bermudan Option**
185. **Real Options - Expansion Customized Option**
186. **Real Options - Jump Diffusion Calls and Puts using Quadranomial Lattices**
187. **Real Options - Mean Reverting Calls and Puts using Trinomial Lattices**
188. **Real Options - Multiple Asset Competing Options (3D Binomial)**
189. **Real Options - Multiple Phased Complex Sequential Compound Option**
190. **Real Options - Multiple Phased Sequential Compound Option**
191. **Real Options - Multiple Phased Simultaneous Compound Option**
192. **Real Options - Simple Calls and Puts using Trinomial Lattices**
193. **Real Options - Simple Two Phased Sequential Compound Option**
194. **Real Options - Simple Two Phased Simultaneous Compound Option**
195. **Real Options - Strategic Cases - High-Tech Manufacturing Strategy A**
196. **Real Options - Strategic Cases - High-Tech Manufacturing Strategy B**
197. **Real Options - Strategic Cases - High-Tech Manufacturing Strategy C**
198. **Real Options - Strategic Cases - Oil and Gas - Strategy A**
199. **Real Options - Strategic Cases - Oil and Gas - Strategy B**
200. **Real Options - Strategic Cases - R&D Stage-Gate Process A**
201. **Real Options - Strategic Cases - R&D Stage-Gate Process B**
202. **Real Options - Strategic Cases - Switching Option's Strategy A**
203. **Real Options - Strategic Cases - Switching Option's Strategy B**

204. **Trinomial Lattices - American Call Option**
205. **Trinomial Lattices - American Put Option**
206. **Trinomial Lattices - European Call Option**
207. **Trinomial Lattices - European Put Option**
208. **Trinomial Lattices - Mean Reverting American Call Option**
209. **Trinomial Lattices - Mean Reverting American Put Option**
210. **Trinomial Lattices - Mean Reverting European Call Option**
211. **Trinomial Lattices - Mean Reverting European Put Option**
212. **Trinomial Lattices - Mean Reverting American Abandonment Option**
213. **Trinomial Lattices - Mean Reverting American Contraction Option**
214. **Trinomial Lattices - Mean Reverting American Expansion Option**
215. **Trinomial Lattices - Mean Reverting American Abandonment, Contraction, Expansion**
216. **Trinomial Lattices - Mean Reverting Bermudan Abandonment, Contraction, Expansion**
217. **Trinomial Lattices - Mean Reverting Customized Abandonment, Contraction, Expansion**
218. **Trinomial Lattices - Mean Reverting European Abandonment, Contraction, Expansion**

219. **Quadranomial Lattices - Jump Diffusion American Call Option**
220. **Quadranomial Lattices - Jump Diffusion American Put Option**
221. **Quadranomial Lattices - Jump Diffusion European Call Option**
222. **Quadranomial Lattices - Jump Diffusion European Put Option**
223. **Pentanomial Lattices - American Rainbow Call Option**
224. **Pentanomial Lattices - American Rainbow Put Option**
225. **Pentanomial Lattices - Dual Reverse Strike American Call (3D Binomial)**
226. **Pentanomial Lattices - Dual Reverse Strike American Put (3D Binomial)**
227. **Pentanomial Lattices - Dual Strike American Call (3D Binomial)**
228. **Pentanomial Lattices - Dual Strike American Put (3D Binomial)**
229. **Pentanomial Lattices - European Rainbow Call Option**
230. **Pentanomial Lattices - European Rainbow Put Option**
231. **Pentanomial Lattices - Exchange of Two Assets American Put (3D Binomial)**
232. **Pentanomial Lattices - Maximum of Two Assets American Call (3D Binomial)**
233. **Pentanomial Lattices - Maximum of Two Assets American Put (3D Binomial)**
234. **Pentanomial Lattices - Minimum of Two Assets American Call (3D Binomial)**
235. **Pentanomial Lattices - Minimum of Two Assets American Put (3D Binomial)**
236. **Pentanomial Lattices - Portfolio American Call (3D Binomial)**
237. **Pentanomial Lattices - Portfolio American Put (3D Binomial)**
238. **Pentanomial Lattices - Spread of Two Assets American Call (3D Binomial)**
239. **Pentanomial Lattices - Spread of Two Assets American Put (3D Binomial)**

Risk Analysis

240. **Integrated Risk Analysis**
241. **Interest Rate Risk**
242. **Portfolio Risk and Return Profile**

Risk Hedging

243. **Delta Gamma Hedge**
244. **Delta Hedge**
245. **Effects of Fixed versus Floating Rates**
246. **Foreign Exchange Cash Flow Model**
247. **Foreign Exchange Exposure Hedging**

Sensitivity

248. **Greeks**
249. **Tornado and Sensitivity Charts Linear**
250. **Tornado and Sensitivity Nonlinear**

Simulation

251. **Basic Simulation Model**
252. **Best Surgical Team**
253. **Correlated Simulation**
254. **Correlation Effects Model**
255. **Data Fitting**
256. **DCF, ROI and Volatility**
257. **Debt Repayment and Amortization**
258. **Demand Curve and Elasticity Estimation**
259. **Infectious Diseases**
260. **Recruitment Budget (Negative Binomial and Multidimensional Simulation)**
261. **Retirement Funding with VBA Macros**
262. **Roulette Wheel**
263. **Time Value of Money**

Six Sigma

264. **Confidence Intervals with Hypothesis Testing**
265. **Control Charts (c, n, p, u, X, XmR, R)**
266. **Delta Precision**
267. **Design of Experiments and Combinatorics**
268. **Hypothesis Testing and Bootstrap Simulation**
269. **Sample Size Correlation**
270. **Sample Size DPU**
271. **Sample Size Mean**
272. **Sample Size Proportion**

273. **Sample Size Sigma**
274. **Statistical Analysis (CDF, PDF, ICDF) with Hypothesis Testing**
275. **Statistical Capability Measures**
276. **Unit Capability Measures**

Valuation

277. **APT, BETA and CAPM**
278. **Buy versus Lease**
279. **Caps and Floors**
280. **Convertible Bonds**
281. **Financial Ratios Analysis**
282. **Financial Statements Analysis**
283. **Valuation Model**
284. **Valuation - Warrant - Combined Value**
285. **Valuation - Warrant - Put Only**
286. **Valuation - Warrant - Warrant Only**

Value at Risk

287. **Optimized and Simulated Portfolio VaR**
288. **Options Delta Portfolio**
289. **Portfolio Operational and Capital Adequacy**
290. **Right Tail Capital Requirements**
291. **Static Covariance Method**

Volatility

292. **EWMA Volatility Models**
293. **GARCH Volatility Models**
294. **Implied Volatility**
295. **Log Asset Returns Approach**
296. **Log Cash Flow Returns Approach Probability to Volatility**

Yield Curve

297. **CIR Model**
298. **Curve Interpolation BIM**
299. **Curve Interpolation NS**
300. **Forward Rates from Spot Rates**
301. **Spline Interpolation and Extrapolation.xls**
302. **Term Structure of Volatility**
303. **US Treasury Risk Free Rate**
304. **Vasicek Model**

List of Functions

Below is a comprehensive list of the functions in Modeling Toolkit that can be accessed either through the analytical DLL libraries or in Excel. Please keep checking back at the website for a more updated list. The software is continually evolving and newer applications and models are constantly added. Finally, the applicable Risk Simulator tools applicable when using the Modeling Toolkit are also listed at the end.

1. B2AEPMarketValueAsset
Market Value of Asset using the Asset-Equity Parity Model.

2. B2AEPMarketValueDebt
Market Value of Debt using the Asset-Equity Parity Model.

3. B2AEPRequiredReturnDebt
Required Return on Risky Debt using the Asset-Equity Parity Model.

4. B2AltDistributionCallOption
Computes the European call option for an underlying asset returns distribution with skew and kurtosis, and is not perfectly normal. May return an error for unsolvable inputs.

5. B2AltDistributionPutOption
Computes the European put option for an underlying asset returns distribution with skew and kurtosis, and is not perfectly normal. May return an error for unsolvable inputs.

6. B2AnnuityRate
Returns the percentage equivalent of the required periodic payment on an annuity (e.g., mortgage payments, loan repayment). Returns the percentage of the total principal at initiation.

7. B2AsianCallwithArithmeticAverageRate
An average rate option is a cash-settled option whose payoff is based on the difference between the arithmetic average value of the underlying during the life of the option and a fixed strike.

8. B2AsianCallwithGeometricAverageRate
An average rate option is a cash-settled option whose payoff is based on the difference between the geometric average value of the underlying during the life of the option and a fixed strike.

9. B2AsianPutwithArithmeticAverageRate
An average rate option is a cash-settled option whose payoff is based on the difference between a fixed strike and the arithmetic average value of the underlying during the life of the option.

10. B2AsianPutwithGeometricAverageRate
An average rate option is a cash-settled option whose payoff is based on the difference between a fixed strike and the geometric average value of the underlying during the life of the option.

11. B2AssetExchangeAmericanOption
Option holder has the right up to and including expiration to swap out Asset 2 and receive Asset 1, with predetermined quantities.

12. B2AssetExchangeEuropeanOption
Option holder has the right at expiration to swap out Asset 2 and receive Asset 1, with predetermined quantities.

13. B2AssetOrNothingCall
At expiration, if in the money, the option holder receives the stock or asset. For a call option, as long as the stock or asset price exceeds the strike at expiration, the stock is received.

14. B2AssetOrNothingPut
At expiration, if in the money, the option holder receives the stock or asset. For a put option, stock is received only if the stock or asset value falls below the strike price.

15. B2BarrierDoubleUpInDownInCall
Valuable or knocked in the money only if either barrier (upper or lower) is breached (i.e., asset value is above the upper or below the lower barriers), and the payout is in the form of a call option on the underlying asset.

16. B2BarrierDoubleUpInDownInPut
Valuable or knocked in the money only if either barrier (upper or lower) is breached (i.e., asset value is above the upper or below the lower barriers), and the payout is in the form of a put option on the underlying asset.

17. B2BarrierDoubleUpOutDownOutCall
Valuable or stays in the money only if either barrier (upper or lower barrier) is not breached, and the payout is in the form of a call option on the underlying asset.

18. B2BarrierDoubleUpOutDownOutPut
Valuable or stays in the money only if either barrier (upper or lower barrier) is not breached, and the payout is in the form of a put option on the underlying asset.

19. B2BarrierDownandInCall
Becomes valuable or knocked in the money if the lower barrier is breached, and the payout is the call option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked in.

20. B2BarrierDownandInPut
Becomes valuable or knocked in the money if the lower barrier is breached, and the payout is the put option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked in.

21. B2BarrierDownandOutCall
Valuable or in the money only if the lower barrier is not breached, and the payout is the call option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked out.

22. B2BarrierDownandOutPut
Valuable or in the money only if the lower barrier is not breached, and the payout is the put option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked out.

23. B2BarrierUpandInCall
Becomes valuable or knocked in the money if the upper barrier is breached, and the payout is the call option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked in.

24. B2BarrierUpandInPut
Becomes valuable or knocked in the money if the upper barrier is breached, and the payout is the put option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked in.

25. B2BarrierUpandOutCall
Valuable or in the money only if the upper barrier is not breached, and the payout is the call option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked out.

26. B2BarrierUpandOutPut
Valuable or in the money only if the upper barrier is not breached, and the payout is the put option on the underlying asset. Sometimes cash is paid at maturity, assuming that the option has not been knocked out.

27. B2BDTAmericanCallonDebtLattice
Computes the American call option on interest-based instruments and debt or bonds, and creates the entire pricing lattice.

28. B2BDTAmericanCallonDebtValue
Computes the American call option value on interest-based instruments and debt or bonds, and returns only one value instead of the entire lattice.

29. B2BDTAmericanPutonDebtLattice
Computes the American put option on interest-based instruments and debt or bonds, and creates the entire pricing lattice.

30. B2BDTAmericanPutonDebtValue
Computes the American put option value on interest-based instruments and debt or bonds, and returns only one value instead of the entire lattice.

31. B2BDTCallableDebtPriceLattice
Computes the revised price lattice of a callable debt such that the options adjusted spread can be imputed. Allows for changing interest and interest volatilities over time.

32. B2BDTCallableDebtPriceValue
Computes the present value of a coupon bond/debt that is callable, to see the differences in value from a noncallable debt. The lattice can be computed using the function call: B2BDTCallableDebtPriceLattice.

33. B2BDTCallableSpreadValue
Computes the option adjusted spread (i.e., the additional premium that should be charged on the callable option provision).

34. B2BDTEuropeanCallonDebtLattice
Computes the European call option on interest-based instruments and debt or bonds, and creates the entire pricing lattice.

35. B2BDTEuropeanCallonDebtValue
Computes the European call option value on interest-based instruments and debt or bonds, and returns only one value instead of the entire lattice.

36. B2BDTEuropeanPutonDebtLattice
Computes the European put option on interest-based instruments and debt or bonds, and creates the entire pricing lattice.

37. B2BDTEuropeanPutonDebtValue
Computes the European put option value on interest-based instruments and debt or bonds, and returns only one value instead of the entire lattice.

38. B2BDTFloatingCouponPriceLattice
Value of the floater bond's lattice (coupon rate is floating and can be directly or inversely related to interest rates; e.g., rates drop, coupon increases, the bond appreciates in price, and the yield increases).

39. B2BDTFloatingCouponPriceValue
Value of the floater bond (coupon rate is floating and can be directly or inversely related to interest rates; e.g., rates drop, coupon increases, the bond appreciates in price, and the yield increases).

40. B2BDTNoncallableDebtPriceLattice
Computes the pricing lattice of a coupon bond/debt that is not callable, to see the differences in value from a callable debt.

41. B2BDTNoncallableDebtPriceValue
Computes the present value of a coupon bond/debt that is not callable, to see the differences in value from a callable debt.

42. B2BDTInterestRateLattice
Computes the short rate interest lattice based on a term structure of interest rates and changing interest volatilities, as a means to compute option values.

43. B2BDTNonCallableSpreadValue
Computes the straight spread on a bond that is noncallable in order to compare it with the option provision of an option adjusted spread model.

44. B2BDTZeroPriceLattice
Computes the straight price lattice of zero bonds based on a term structure of interest rates and changing interest volatilities, as a means to compute interest-based option values.

45. B2BDTZeroPriceLattice2
Computes the straight price lattice of zero bonds based on a term structure of interest rates and changing interest volatilities, as a means to compute interest-based option values. Returns the same results as the B2BDTZeroPriceLattice function but requires interest rates and interest volatilities as inputs, rather than the entire interest rate lattice.

46. B2BDTZeroPriceValue
Computes the straight price of zero bonds at time zero, based on a term structure of interest rates and changing interest volatilities, as a means to compute interest-based option values.

47. B2BinaryDownAndInAssetAtExpirationOrNothing
Binary digital instrument receiving the asset at expiration, only if a corresponding asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

48. B2BinaryDownAndInAssetAtExpirationOrNothingCall
Binary digital call option receiving the asset at expiration if the asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

49. B2BinaryDownAndInAssetAtExpirationOrNothingPut
Binary digital put option receiving the asset at expiration if the asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

50. B2BinaryDownAndInAssetAtHitOrNothing
Binary digital instrument receiving the asset when it hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

51. B2BinaryDownAndInCashAtExpirationOrNothing
Binary digital instrument receiving a cash amount at expiration, only if a corresponding asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

52. B2BinaryDownAndInCashAtExpirationOrNothingCall
Binary digital call option receiving the cash at expiration if the asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

53. B2BinaryDownAndInCashAtExpirationOrNothingPut
Binary digital put option receiving the cash at expiration if the asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

54. B2BinaryDownAndInCashAtHitOrNothing
Binary digital instrument receiving a cash amount when a corresponding asset hits a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

55. B2BinaryDownAndOutAssetAtExpirationOrNothing
Binary digital instrument receiving the asset at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

56. B2BinaryDownAndOutAssetAtExpirationOrNothingCall
Binary digital call options receiving the asset at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

57. B2BinaryDownAndOutAssetAtExpirationOrNothingPut
Binary digital put options receiving the asset at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

58. B2BinaryDownAndOutCashAtExpirationOrNothing
Binary digital instrument receiving a cash amount at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

59. B2BinaryDownAndOutCashAtExpirationOrNothingCall
Binary digital call option receiving a cash amount at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

60. B2BinaryDownAndOutCashAtExpirationOrNothingPut
Binary digital put option receiving a cash amount at expiration, only if a corresponding asset does not hit a lower barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

61. B2BinaryUpAndInAssetAtExpirationOrNothing
Binary digital instrument receiving the asset at expiration, only if a corresponding asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

62. B2BinaryUpAndInAssetAtExpirationOrNothingCall
Binary digital call option receiving the asset at expiration if the asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

63. B2BinaryUpAndInAssetAtExpirationOrNothingPut
Binary digital put option receiving the asset at expiration if the asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

64. B2BinaryUpAndInAssetAtHitOrNothing
Binary digital instrument receiving the asset when it hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

65. B2BinaryUpAndInCashAtExpirationOrNothing
Binary digital instrument receiving a cash amount at expiration, only if a corresponding asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

66. B2BinaryUpAndInCashAtExpirationOrNothingCall
Binary digital call option receiving the cash at expiration if the asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

67. B2BinaryUpAndInCashAtExpirationOrNothingPut
Binary digital put option receiving the cash at expiration if the asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

68. B2BinaryUpAndInCashAtHitOrNothing
Binary digital instrument receiving a cash amount when a corresponding asset hits an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

69. B2BinaryUpAndOutAssetAtExpirationOrNothing
Binary digital instrument receiving the asset at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

70. B2BinaryUpAndOutAssetAtExpirationOrNothingCall
Binary digital call options receiving the asset at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

71. B2BinaryUpAndOutAssetAtExpirationOrNothingPut
Binary digital put options receiving the asset at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

72. B2BinaryUpAndOutCashAtExpirationOrNothing
Binary digital instrument receiving a cash amount at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

73. B2BinaryUpAndOutCashAtExpirationOrNothingCall
Binary digital call option receiving a cash amount at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

74. B2BinaryUpAndOutCashAtExpirationOrNothingPut
Binary digital put option receiving a cash amount at expiration, only if a corresponding asset does not hit an upper barrier or receives nothing otherwise. DT is monitoring steps: 1/12 monthly, 1/52 weekly, 1/250 daily, 0 continuously.

75. B2Binomial3DAmericanDualStrikeCallOption
Returns the American option with the payoff [$\text{Max}(Q_2S_2 - X_2, Q_1S_1 - X_1)$] and valued using a 3D binomial lattice model.

76. B2Binomial3DAmericanDualStrikePutOption
Returns the American option with the payoff [$\text{Max}(X_2 - Q_2S_2, X_1 - Q_1S_1)$] and valued using a 3D binomial lattice model.

77. B2Binomial3DEuropeanDualStrikeCallOption
Returns the European option with the payoff [$\text{Max}(Q_2S_2 - X_2, Q_1S_1 - X_1)$] and valued using a 3D binomial lattice model.

78. B2Binomial3DEuropeanDualStrikePutOption
Returns the European option with the payoff [$\text{Max}(X_2 - Q_2S_2, X_1 - Q_1S_1)$] and valued using a 3D binomial lattice model.

79. B2Binomial3DAmericanExchangeOption
Returns the American and European call and put option (same values exist for all types) with the payoff ($Q_2S_2 - Q_1S_1$) and valued using a 3D binomial lattice model.

80. B2Binomial3DAmericanMaximumTwoAssetsCallOption
Returns the American option with the payoff [$\text{Max}(Q_2S_2, Q_1S_1) - X$] and valued using a 3D binomial lattice model.

81. B2Binomial3DAmericanMaximumTwoAssetsPutOption
Returns the American option with the payoff [$X - \text{Max}(Q_2S_2, Q_1S_1)$] and valued using a 3D binomial lattice model.

82. B2Binomial3DEuropeanMaximumTwoAssetsCallOption
Returns the European option with the payoff [$\text{Max}(Q_2S_2, Q_1S_1) - X$] and valued using a 3D binomial lattice model.

83. B2Binomial3DEuropeanMaximumTwoAssetsPutOption
Returns the European option with the payoff [$X - \text{Max}(Q_2S_2, Q_1S_1)$] and valued using a 3D binomial lattice model.

84. B2Binomial3DAmericanMinimumTwoAssetsCallOption
Returns the American option with the payoff [$\text{Min}(Q_2S_2, Q_1S_1) - X$] and valued using a 3D binomial lattice model.

85. B2Binomial3DAmericanMinimumTwoAssetsPutOption
Returns the American option with the payoff [X – Min(Q_2S_2, Q_1S_1)] and valued using a 3D binomial lattice model.

86. B2Binomial3DEuropeanMinimumTwoAssetsCallOption
Returns the European option with the payoff [Min(Q_2S_2, Q_1S_1) – X] and valued using a 3D binomial lattice model.

87. B2Binomial3DEuropeanMinimumTwoAssetsPutOption
Returns the European option with the payoff [X – Min(Q_2S_2, Q_1S_1)] and valued using a 3D binomial lattice model.

88. B2Binomial3DAmericanPortfolioCallOption
Returns the American option with the payoff (Q_2S_2 + Q_1S_1 – X) and valued using a 3D binomial lattice model.

89. B2Binomial3DAmericanPortfolioPutOption
Returns the American option with the payoff (X – Q_2S_2 + Q_1S_1) and valued using a 3D binomial lattice model.

90. B2Binomial3DEuropeanPortfolioCallOption
Returns the European option with the payoff (Q_2S_2 + Q_1S_1 – X) and valued using a 3D binomial lattice model.

91. B2Binomial3DEuropeanPortfolioPutOption
Returns the European option with the payoff (X – Q_2S_2 + Q_1S_1) and valued using a 3D binomial lattice model.

92. B2Binomial3DAmericanReverseDualStrikeCallOption
Returns the American option with the payoff [Max(X_2 – Q_2S_2, Q_1S1 – X_1)] and valued using a 3D binomial lattice model.

93. B2Binomial3DAmericanReverseDualStrikePutOption
Returns the American option with the payoff [Max(Q_2S_2 – X_2, X_1 – Q_1S_1)] and valued using a 3D binomial lattice model.

94. B2Binomial3DEuropeanReverseDualStrikeCallOption
Returns the European option with the payoff [Max(X_2 – Q_2S_2, Q_1S_1 – X_1)] and valued using a 3D binomial lattice model.

95. B2Binomial3DEuropeanReverseDualStrikePutOption
Returns the American option with the payoff [Max(Q_2S_2 – X_2, X_1 – Q_1S_1)] and valued using a 3D binomial lattice model.

96. B2Binomial3DAmericanSpreadCallOption
Returns the American option with the payoff (Q_1S_1 – Q_2S_2 – X) and valued using a 3D binomial lattice model.

97. B2Binomial3DAmericanSpreadPutOption
Returns the American option with the payoff (X + Q_2S_2 – Q_1S_1) and valued using a 3D binomial lattice model.

98. B2Binomial3DEuropeanSpreadCallOption
Returns the European option with the payoff (Q_1S_1 – Q_2S_2 – X) and valued using a 3D binomial lattice model.

99. B2Binomial3DEuropeanSpreadPutOption
Returns the European option with the payoff ($X + Q_2S_2 – Q_1S_1$) and valued using a 3D binomial lattice model.

100. B2BinomialAdjustedBarrierSteps
Computes the correct binomial lattice steps to use for convergence and barrier matching when running a barrier option.

101. B2BinomialAmericanCall
Returns the American call option with a continuous dividend yield using a binomial lattice, where the option can be exercised at any time up to and including maturity.

102. B2BinomialAmericanPut
Returns the American put option with a continuous dividend yield using a binomial lattice, where the option can be exercised at any time up to and including maturity.

103. B2BinomialBermudanCall
Returns the American call option with a continuous dividend yield using a binomial lattice, where the option can be exercised at any time up to and including maturity except during the vesting period.

104. B2BinomialBermudanPut
Returns the American put option with a continuous dividend yield using a binomial lattice, where the option can be exercised at any time up to and including maturity except during the vesting period.

105. B2BinomialEuropeanCall
Returns the European call option with a continuous dividend yield using a binomial lattice, where the option can be exercised only at maturity.

106. B2BinomialEuropeanPut
Returns the European put option with a continuous dividend yield using a binomial lattice, where the option can be exercised only at maturity.

107. B2BlackCallOptionModel
Returns the Black model (modified Black-Scholes-Merton) for forward contracts and interest-based call options.

108. B2BlackPutOptionModel
Returns the Black model (modified Black-Scholes-Merton) for forward contracts and interest-based put options.

109. B2BlackFuturesCallOption
Computes the value of a commodities futures call option given the value of the futures contract.

110. B2BlackFuturesPutOption
Computes the value of a commodities futures put option given the value of the futures contract.

111. B2BlackScholesCall
European call option using the Black-Scholes-Merton model.

112. B2BlackScholesProbabilityAbove
Computes the expected probability the stock price will rise above the strike price under a Black-Scholes paradigm.

113. B2BlackScholesPut
European put option using the Black-Scholes-Merton model.

114. B2BondCIRBondDiscountFactor
Returns the discount factor on a bond or risky debt using the Cox-Ingersoll-Ross model, accounting for mean-reverting interest rates.

115. B2BondCIRBondPrice
Cox-Ross model on Zero Coupon Bond Pricing assuming no arbitrage and mean-reverting interest rates.

116. B2BondCIRBondYield
Cox-Ross model on Zero Coupon Bond Yield assuming no arbitrage and mean-reverting interest rates.

117. B2BondConvexityContinuous
Returns the debt's Convexity or second order sensitivity using a series of cash flows and current interest rate, with continuous discounting.

118. B2BondConvexityDiscrete
Returns the debt's Convexity or second order sensitivity using a series of cash flows and current interest rate, with discrete discounting.

119. B2BondConvexityYTMContinuous
Returns the debt's Convexity or second order sensitivity using an internal Yield to Maturity of the cash flows, with continuous discounting.

120. B2BondConvexityYTMDiscrete
Returns the debt's Convexity or second order sensitivity using an internal Yield to Maturity of the cash flows, with discrete discounting.

121. B2BondDurationContinuous
Returns the debt's first order sensitivity Duration measure using continuous discounting.

122. B2BondDurationDiscrete
Returns the debt's first order sensitivity Duration measure using discrete discounting.

123. B2BondHullWhiteBondCallOption
Values a European call option on a bond where the interest rates are stochastic and mean-reverting. Make sure Bond Maturity > Option Maturity.

124. B2BondHullWhiteBondPutOption
Values a European put option on a bond where the interest rates are stochastic and mean-reverting. Make sure Bond Maturity > Option Maturity.

125. B2BondMacaulayDuration
Returns the debt's first order sensitivity Macaulay Duration measure.

126. B2BondMertonBondPrice
Bond price using Merton Stochastic Interest and Stochastic Asset Model.

127. B2BondModifiedDuration
Returns the debt's first order sensitivity Modified Duration measure.

128. B2BondPriceContinuous
Returns the bond price of a cash flow series given the time and discount rate, using continuous discounting.

129. B2BondPriceDiscrete
Returns the bond price of a cash flow series given the time and discount rate, using discrete discounting.

130. B2BondVasicekBondCallOption
Values a European call option on a bond where the interest rates are stochastic and mean-reverting to a long-term rate. Make sure Bond Maturity > Option Maturity.

131. B2BondVasicekBondPrice
Vasicek Zero Coupon Price assuming no arbitrage and mean-reverting interest rates.

132. B2BondVasicekBondPutOption
Values a European put option on a bond where the interest rates are stochastic and mean-reverting to a long-term rate. Make sure Bond Maturity > Option Maturity.

133. B2BondVasicekBondYield
Vasicek Zero Coupon Yield assuming no arbitrage and mean-reverting interest rates.

134. B2BondYTMContinuous
Returns bond's Yield to Maturity assuming continuous discounting.

135. B2BondYTMDiscrete
Returns bond's Yield to Maturity assuming discrete discounting.

136. B2CallDelta
Returns the option valuation sensitivity Delta (a call option value's sensitivity to changes in the asset value).

137. B2CallGamma
Returns the option valuation sensitivity Gamma (a call option value's sensitivity to changes in the Delta value).

138. B2CallOptionOnTheMax
The maximum values at expiration of both assets are used in option exercise, where the call option payoff at expiration is the maximum price between Asset 1 and Asset 2 against the strike price.

139. B2CallOptionOnTheMin
The minimum values at expiration of both assets are used in option exercise, where the call option payoff at expiration is the minimum price between Asset 1 and Asset 2 against the strike price.

140. B2CallRho
Returns the option valuation sensitivity Rho (a call option value's sensitivity to changes in the interest rate).

141. B2CallTheta
Returns the option valuation sensitivity Theta (a call option value's sensitivity to changes in the maturity).

142. B2CallVega
Returns the option valuation sensitivity Vega (a call option value's sensitivity to changes in the volatility).

143. B2CashOrNothingCall
At expiration, if the option is in the money, the option holder receives a predetermined cash payment. For a call option, as long as the stock or asset price exceeds the strike at expiration, cash is received.

144. B2CashOrNothingPut
At expiration, if the option is in the money, the option holder receives a predetermined cash payment. For a put option, cash is received only if the stock or asset value falls below the strike price.

145. B2ChooserBasicOption
Holder chooses whether the option is a call or a put by the chooser time, with the same strike price and maturity. Typically cheaper than buying a call and a put together while providing the same level of hedge.

146. B2ChooserComplexOption
Holder gets to choose whether the option is a call or a put within the Chooser Time, with different strike prices and maturities. Typically cheaper than buying a call and a put, while providing the same level of hedge.

147. B2ClosedFormAmericanCall
Returns the American option approximation model with a continuous dividend yield call option.

148. B2ClosedFormAmericanPut
Returns the American option approximation model with a continuous dividend yield put option.

149. B2CoefficientofVariationPopulation
Computes the population coefficient of variation (standard deviation of the sample divided by the mean), to obtain a relative measure of risk and dispersion.

150. B2CoefficientofVariationSample
Computes the sample coefficient of variation (standard deviation of the sample divided by the mean), to obtain a relative measure of risk and dispersion.

151. B2CommodityCallOptionModel
Computes the value of a commodity-based call option based on spot and futures market, and accounting for volatility of the forward rate.

152. B2CommodityPutOptionModel
Computes the value of a commodity-based put option based on spot and futures market, and accounting for volatility of the forward rate.

153. B2CompoundOptionsCallonCall
A compound option allowing the holder to buy (call) a call option with some maturity, in the future within the option maturity period, for a specified strike price on the option.

154. B2CompoundOptionsCallonPut
A compound option allowing the holder to buy (call) a put option with some maturity, in the future within the option maturity period, for a specified strike price on the option.

155. B2CompoundOptionsPutonCall
A compound option allowing the holder to sell (put) a call option with some maturity, in the future within the option maturity period, for a specified strike price on the option.

156. B2CompoundOptionsPutonPut
A compound option allowing the holder to sell (put) a call option with some maturity, in the future within the option maturity period, for a specified strike price on the option.

157. B2ConvenienceYield
The convenience yield is simply the rate differential between a non-arbitrage futures and spot price and a real-life fair market value of the futures price.

158. B2ConvertibleBondAmerican
Computes the value of an American convertible bond using binomial lattices, and accounting for the stock's volatility and dividend yield, as well as the bond's credit spread above risk-free.

159. B2ConvertibleBondEuropean
Computes the value of a European convertible bond using binomial lattices, and accounting for the stock's volatility and dividend yield, as well as the bond's credit spread above risk-free.

160. B2CreditAcceptanceCost
Computes the risk-adjusted cost of accepting a new credit line with a probability of default.

161. B2CreditAssetSpreadCallOption
Provides protection from an increase in spread but ceases to exist if the underlying asset defaults and the option is based on the price of the asset.

162. B2CreditAssetSpreadPutOption
Provides protection from a decrease in spread but ceases to exist if the underlying asset defaults and the option is based on the price of the asset.

163. B2CreditDefaultSwapSpread
Returns the valuation of a credit default swap (CDS) spread, allowing the holder to sell a bond/debt at par value when a credit event occurs.

164. B2CreditDefaultSwapCorrelatedBondandSwapPrice
Computes the valuation of a bond with a credit default swap where both parties are correlated and each has a probability of default and possible recovery rates. At default, the holder receives the notional principal or par value of the bond.

165. B2CreditDefaultSwapCorrelatedBondPrice
Computes the valuation of a bond without any credit default swap where the bond or debt has a probability of default and possible recovery rate.

166. B2CreditDefaultSwapCorrelatedSwapPrice
Computes the price of a credit default swap where both parties are correlated and each has a probability of default and possible recovery rates. At default, the holder receives the notional principal or par value of the bond.

167. B2CreditRatingWidth
Computes the credit ratings width to generate the credit ratings table.

168. B2CreditRejectionCost
Computes the risk-adjusted cost of rejecting a new credit line with a probability of default.

169. B2CreditRiskShortfall
Returns the Credit Risk Shortfall given probability of default and recovery rates.

170. B2CreditSpreadCallOption
Provides protection from an increase in spread but ceases to exist if the underlying asset defaults. Only credit default swaps can cover default events. Credit spread options (CSOs) are sometimes combined with CDSs.

171. B2CreditSpreadPutOption
Provides protection from a decrease in spread but ceases to exist if the underlying asset defaults. Only credit default swaps can cover default events (CSOs are sometimes combined with CDSs).

172. B2CubicSpline
Interpolates and extrapolates the unknown *Y* values (based on the required *X* value) given some series of known *X* and *Y* values, and can be used to interpolate inside the data sample or extrapolate outside the known sample.

173. B2CurrencyCallOption
Option to exchange foreign currency into domestic currency by buying domestic currency (selling foreign currency) at a set exchange rate on a specified date. Exchange rate is foreign currency to domestic currency.

174. B2CurrencyForwardCallOption
Computes the value of a currency forward call option.

175. B2CurrencyForwardPutOption
Computes the value of a currency forward put option.

176. B2CurrencyPutOption
Option to exchange domestic currency into foreign currency by selling domestic currency (buying foreign currency) at a set exchange rate on a specified date. Exchange rate is foreign currency to domestic currency.

177. B2DeltaGammaHedgeCallBought
Computes the total amount of call values that has to be bought to perform a Delta-Gamma neutral hedge. Returns a negative value indicating cash outflow.

178. B2DeltaGammaHedgeCallSold
Computes the single unit of call value that has to be sold to perform a Delta-Gamma neutral hedge. Returns a positive value indicating cash inflow.

179. B2DeltaGammaHedgeMoneyBorrowed
Computes the amount of money that has to be borrowed to perform a Delta-Gamma neutral hedge. Returns a positive value indicating cash inflow.

180. B2DeltaGammaHedgeSharesBought
Computes the total value of stocks that have to be bought to perform a Delta-Gamma neutral hedge. Returns a negative value indicating cash outflow.

181. B2DeltaHedgeCallSold
Computes the single unit of call value that has to be sold to perform a Delta-neutral hedge. Returns a positive value indicating cash inflow.

182. B2DeltaHedgeMoneyBorrowed
Computes the amount of money that has to be borrowed to perform a Delta-neutral hedge. Returns a positive value indicating cash inflow.

183. B2DeltaHedgeSharesBought
Computes the total value of stocks that have to be bought to perform a Delta-neutral hedge. Returns a negative value indicating cash outflow.

184. B2DistributionBernoulliKurtosis
Returns the Bernoulli distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

185. B2DistributionBernoulliMean
Returns the Bernoulli distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

186. B2DistributionBernoulliSkew
Returns the Bernoulli distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and the tail points to the left.

187. B2DistributionBernoulliStdev
Returns the Bernoulli distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

188. B2DistributionBetaKurtosis
Returns the Beta distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

189. B2DistributionBetaMean
Returns the Beta distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

190. B2DistributionBetaSkew
Returns the Beta distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and the tail points to the left.

191. B2DistributionBetaStdev
Returns the Beta distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

192. B2DistributionBinomialKurtosis
Returns the Binomial distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

193. B2DistributionBinomialMean
Returns the Binomial distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

194. B2DistributionBinomialSkew
Returns the Binomial distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and the tail points to the left.

195. B2DistributionBinomialStdev
Returns the Binomial distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

196. B2DistributionCauchyKurtosis
Returns the Cauchy distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

197. B2DistributionCauchyMean
Returns the Cauchy distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

198. B2DistributionCauchySkew
Returns the Cauchy distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

199. B2DistributionCauchyStdev
Returns the Cauchy distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

200. B2DistributionChiSquareKurtosis
Returns the Chi-Square distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

201. B2DistributionChiSquareMean
Returns the Chi-Square distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

202. B2DistributionChiSquareSkew
Returns the Chi-Square distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

203. B2DistributionChiSquareStdev
Returns the Chi-Square distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

204. B2DistributionDiscreteUniformKurtosis
Returns the Discrete Uniform distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

205. B2DistributionDiscreteUniformMean
Returns the Discrete Uniform distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

206. B2DistributionDiscreteUniformSkew
Returns the Discrete Uniform distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

207. B2DistributionDiscreteUniformStdev
Returns the Discrete Uniform distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

208. B2DistributionExponentialKurtosis
Returns the Exponential distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

209. B2DistributionExponentialMean
Returns the Exponential distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

210. B2DistributionExponentialSkew
Returns the Exponential distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

211. B2DistributionExponentialStdev
Returns the Exponential distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

212. B2DistributionFKurtosis
Returns the F distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

213. B2DistributionFMean
Returns the F distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

214. B2DistributionFSkew
Returns the F distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

215. B2DistributionFStdev
Returns the F distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

216. B2DistributionGammaKurtosis
Returns the Gamma distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

217. B2DistributionGammaMean
Returns the Gamma distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

218. B2DistributionGammaSkew
Returns the Gamma distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive skew means average exceeds median and the tail points to the right, whereas negative skew means average is less than median and tail points to left.

219. B2DistributionGammaStdev
Returns the Gamma distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

220. B2DistributionGeometricKurtosis
Returns the Geometric distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

221. B2DistributionGeometricMean
Returns the Geometric distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

222. B2DistributionGeometricSkew
Returns the Geometric distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

223. B2DistributionGeometricStdev
Returns the Geometric distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

224. B2DistributionGumbelMaxKurtosis
Returns the Gumbel Max distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

225. B2DistributionGumbelMaxMean
Returns the Gumbel Max distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

226. B2DistributionGumbelMaxSkew
Returns the Gumbel Max distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

227. B2DistributionGumbelMaxStdev
Returns the Gumbel Max distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

228. B2DistributionGumbelMinKurtosis
Returns the Gumbel Min distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

229. B2DistributionGumbelMinMean
Returns the Gumbel Min distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

230. B2DistributionGumbelMinSkew
Returns the Gumbel Min distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

231. B2DistributionGumbelMinStdev
Returns the Gumbel Min distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

232. B2DistributionHypergeometricKurtosis
Returns the Hypergeometric distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

233. B2DistributionHypergeometricMean
Returns the Hypergeometric distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

234. B2DistributionHypergeometricSkew
Returns the Hypergeometric distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

235. B2DistributionHypergeometricStdev
Returns the Hypergeometric distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

236. B2DistributionLogisticKurtosis
Returns the Logistic distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

237. B2DistributionLogisticMean
Returns the Logistic distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

238. B2DistributionLogisticSkew
Returns the Logistic distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

239. B2DistributionLogisticStdev
Returns the Logistic distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

240. B2DistributionLognormalKurtosis
Returns the Lognormal distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

241. B2DistributionLognormalMean
Returns the Lognormal distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

242. B2DistributionLognormalSkew
Returns the Lognormal distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

243. B2DistributionLognormalStdev
Returns the Lognormal distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

244. B2DistributionNegativeBinomialKurtosis
Returns the Negative Binomial distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

245. B2DistributionNegativeBinomialMean
Returns the Negative Binomial distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

246. B2DistributionNegativeBinomialSkew
Returns the Negative Binomial distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

247. B2DistributionNegativeBinomialStdev
Returns the Negative Binomial distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

248. B2DistributionNormalKurtosis
Returns the Normal distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

249. B2DistributionNormalMean
Returns the Normal distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

250. B2DistributionNormalSkew
Returns the Normal distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

251. B2DistributionNormalStdev
Returns the Normal distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

252. B2DistributionParetoKurtosis
Returns the Pareto distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

253. B2DistributionParetoMean
Returns the Pareto distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

254. B2DistributionParetoSkew
Returns the Pareto distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

255. B2DistributionParetoStdev
Returns the Pareto distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

256. B2DistributionPoissonKurtosis
Returns the Poisson distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

257. B2DistributionPoissonMean
Returns the Poisson distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

258. B2DistributionPoissonSkew
Returns the Poisson distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

259. B2DistributionPoissonStdev
Returns the Poisson distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

260. B2DistributionRayleighKurtosis
Returns the Rayleigh distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

261. B2DistributionRayleighMean
Returns the Rayleigh distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

262. B2DistributionRayleighSkew
Returns the Rayleigh distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

263. B2DistributionRayleighStdev
Returns the Rayleigh distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

264. B2DistributionTKurtosis
Returns the Student's T distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

265. B2DistributionTMean
Returns the Student's T distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

266. B2DistributionTSkew
Returns the Student's T distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

267. B2DistributionTStdev
Returns the Student's T distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

268. B2DistributionTriangularKurtosis
Returns the Triangular distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

269. B2DistributionTriangularMean
Returns the Triangular distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

270. B2DistributionTriangularSkew
Returns the Triangular distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

271. B2DistributionTriangularStdev
Returns the Triangular distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

272. B2DistributionUniformKurtosis
Returns the Uniform distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

273. B2DistributionUniformMean
Returns the Uniform distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

274. B2DistributionUniformSkew
Returns the Uniform distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

275. B2DistributionUniformStdev
Returns the Uniform distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

276. B2DistributionWeibullKurtosis
Returns the Weibull distribution's theoretical excess kurtosis (fourth moment), measuring the peakedness of the distribution and its extreme tail events. An excess kurtosis of 0 implies a normal tail.

277. B2DistributionWeibullMean
Returns the Weibull distribution's theoretical mean or expected value (first moment), measuring the central tendency of the distribution.

278. B2DistributionWeibullSkew
Returns the Weibull distribution's theoretical skew (third moment), measuring the direction of the distribution's tail. Positive (negative) skew means average exceeds (is less than) median and the tail points to the right (left).

279. B2DistributionWeibullStdev
Returns the Weibull distribution's theoretical standard deviation (second moment), measuring the width and average dispersion of all points around the mean.

280. B2DistributionCDFBernoulli
Computes the Bernoulli distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

281. B2DistributionCDFBeta
Computes the Beta distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

282. B2DistributionCDFBinomial
Computes the Binomial distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

283. B2DistributionCDFChiSquare
Computes the Chi-Square distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

284. B2DistributionCDFDiscreteUniform
Computes the Discrete Uniform distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

285. B2DistributionCDFExponential
Computes the Exponential distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

286. B2DistributionCDFFDist
Computes the F distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

287. B2DistributionCDFGamma
Computes the Gamma distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

288. B2DistributionCDFGeometric
Computes the Geometric distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

289. B2DistributionCDFGumbelMax
Computes the Gumbel Max distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

290. B2DistributionCDFGumbelMin
Computes the Gumbel Min distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

291. B2DistributionCDFLogistic
Computes the Logistic distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

292. B2DistributionCDFLognormal
Computes the Lognormal distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

293. B2DistributionCDFNormal
Computes the Normal distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

294. B2DistributionCDFPareto
Computes the Pareto distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

295. B2DistributionCDFPoisson
Computes the Poisson distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

296. B2DistributionCDFRayleigh
Computes the Rayleigh distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

297. B2DistributionCDFStandardNormal
Computes the Standard Normal distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

298. B2DistributionCDFTDist
Computes the Student's T distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

299. B2DistributionCDFTriangular
Computes the Triangular distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

300. B2DistributionCDFUniform
Computes the Uniform distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

301. B2DistributionCDFWeibull
Computes the Weibull distribution's theoretical Cumulative Distribution Function (CDF)—that is, the cumulative probability of the distribution at all points less than or equal to *X*.

302. B2DistributionICDFBernoulli
Computes the Bernoulli distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

303. B2DistributionICDFBeta
Computes the Beta distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

304. B2DistributionICDFBinomial
Computes the Binomial distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

305. B2DistributionICDFChiSquare
Computes the Chi-Square distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

306. B2DistributionICDFDiscreteUniform
Computes the Discrete Uniform distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

307. B2DistributionICDFExponential
Computes the Exponential distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

308. B2DistributionICDFFDist
Computes the F distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

309. B2DistributionICDFGamma
Computes the Gamma distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

310. B2DistributionICDFGeometric
Computes the Geometric distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

311. B2DistributionICDFGumbelMax
Computes the Gumbel Max distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

312. B2DistributionICDFGumbelMin
Computes the Gumbel Min distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

313. B2DistributionICDFLogistic
Computes the Logistic distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

314. B2DistributionICDFLognormal
Computes the Lognormal distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

315. B2DistributionICDFNormal
Computes the Normal distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

316. B2DistributionICDFPareto
Computes the Pareto distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

317. B2DistributionICDFPoisson
Computes the Poisson distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

318. B2DistributionICDFRayleigh
Computes the Rayleigh distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

319. B2DistributionICDFStandardNormal
Computes the Standard Normal distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

320. B2DistributionICDFTDist
Computes the Student's T distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

321. B2DistributionICDFTriangular
Computes the Triangular distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

322. B2DistributionICDFUniform
Computes the Uniform distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

323. B2DistributionICDFWeibull
Computes the Weibull distribution's theoretical Inverse Cumulative Distribution Function (ICDF); that is, given the cumulative probability between 0 and 1 and the distribution's parameters, the function returns the relevant *X* value.

324. B2DistributionPDFBernoulli
Computes the Bernoulli distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

325. B2DistributionPDFBeta
Computes the Beta distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

326. B2DistributionPDFBinomial
Computes the Binomial distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

327. B2DistributionPDFChiSquare
Computes the Chi-Square distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

328. B2DistributionPDFDiscreteUniform
Computes the Discrete Uniform distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

329. B2DistributionPDFExponential
Computes the Exponential distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

330. B2DistributionPDFFDist
Computes the F distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

331. B2DistributionPDFGamma
Computes the Gamma distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

332. B2DistributionPDFGeometric
Computes the Geometric distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

333. B2DistributionPDFGumbelMax
Computes the Gumbel Max distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

334. B2DistributionPDFGumbelMin
Computes the Gumbel Min distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

335. B2DistributionPDFLogistic
Computes the Logistic distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

336. B2DistributionPDFLognormal
Computes the Lognormal distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

337. B2DistributionPDFNormal
Computes the Normal distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

338. B2DistributionPDFPareto
Computes the Pareto distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

339. B2DistributionPDFPoisson
Computes the Poisson distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

340. B2DistributionPDFRayleigh
Computes the Rayleigh distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

341. B2DistributionPDFStandardNormal
Computes the Standard Normal distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

342. B2DistributionPDFTDist
Computes the Student's T distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

343. B2DistributionPDFTriangular
Computes the Triangular distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

344. B2DistributionPDFUniform
Computes the Uniform distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

345. B2DistributionPDFWeibull
Computes the Weibull distribution's theoretical Probability Density Function (PDF). The PDF of a discrete distribution returns the exact probability mass function or probability of occurrence, but the PDFs of continuous distributions are only theoretical values and not exact probabilities.

346. B2EquityLinkedFXCallOptionDomesticValue
Call options whose underlying asset is in a foreign equity market, and the fluctuations of the foreign exchange risk are hedged by having a strike price on the foreign exchange rate. Resulting valuation is in the domestic currency.

347. B2EquityLinkedFXPutOptionDomesticValue
Put options whose underlying asset is in a foreign equity market, and the fluctuations of the foreign exchange risk are hedged by having a strike price on the foreign exchange rate. Resulting valuation is in the domestic currency.

348. B2EWMAVolatilityForecastGivenPastPrices
Computes the annualized volatility forecast of the next period, given a series of historical prices and the corresponding weights placed on the previous volatility estimate.

349. B2EWMAVolatilityForecastGivenPastVolatility
Computes the annualized volatility forecast of the next period given the previous period's volatility and changes in stock returns in the previous period.

350. B2ExtremeSpreadCallOption
Maturities are divided into two segments, and the call option pays the difference between the max assets from segment two and max of segment one.

351. B2ExtremeSpreadPutOption
Maturities are divided into two segments, and the put option pays the difference between the min of segment two's asset value and the min of segment one's asset value.

352. B2ExtremeSpreadReverseCallOption
Maturities are divided into two segments, and a reverse call pays the min from segment one less the min of segment two.

353. B2ExtremeSpreadReversePutOption
Maturities are divided into two segments, and a reverse put pays the max of segment one less the max of the segment two.

354. B2FiniteDifferenceAmericanCall
Computes the American call option using finite differencing methods, as an alternative to simulation, closed-form approximation models, and lattices.

355. B2FiniteDifferenceAmericanPut
Computes the American put option using finite differencing methods, as an alternative to simulation, closed-form approximation models, and lattices.

356. B2FiniteDifferenceEuropeanCall
Computes the European call option using finite differencing methods, as an alternative to simulation, closed-form approximation models, and lattices.

357. B2FiniteDifferenceEuropeanPut
Computes the European put option using finite differencing methods, as an alternative to simulation, closed-form approximation models, and lattices.

358. B2FixedStrikeLookbackCall
Strike price is fixed, while at expiration the payoff is the difference between the maximum asset price less the strike price during the lifetime of the option.

359. B2FixedStrikeLookbackPut
Strike price is fixed, while at expiration the payoff is the maximum difference between the lowest observed asset price less the strike price during the lifetime of the option.

360. B2FixedStrikePartialLookbackCall
Strike price is fixed, while at expiration the payoff is the difference between the maximum asset price less the strike price during the starting period of the lookback to the maturity of the option.

361. B2FixedStrikePartialLookbackPut
Strike price is fixed, while at expiration the payoff is the maximum difference between the lowest observed asset price less the strike price during the starting period of the lookback to the maturity of the option.

362. B2FloatingStrikeLookbackCallonMin
Strike price is floating, while at expiration the payoff on the call option is being able to purchase the underlying asset at the minimum observed price during the life of the option.

363. B2FloatingStrikeLookbackPutonMax
Strike price is floating, while at expiration the payoff on the put option is being able to sell the underlying asset at the maximum observed asset price during the life of the option.

364. B2FloatingStrikePartialLookbackCallonMin
Strike price is floating, while at expiration the payoff on the call option is being able to purchase the underlying at the minimum observed asset price from inception to the end of the lookback time.

365. B2FloatingStrikePartialLookbackPutonMax
Strike price is floating, while at expiration the payoff on the put option is being able to sell the underlying at the maximum observed asset price from inception to the end of the lookback time.

366. B2ForecastBrownianMotionSimulatedSeries
Computes the entire time-series of Brownian motion stochastic process forecast values.

367. B2ForecastDistributionValue
Computes the forecast price of an asset in the future, assuming the asset follows a Brownian motion random walk and returns the forecast price given the cumulative probability level.

368. B2ForecastDistributionValuePercentile
Computes the cumulative probability or percentile of an asset in the future, assuming the asset follows a Brownian motion random walk and returns the forecast cumulative percentile given the future price.

369. B2ForecastDistributionReturns
Computes the forecast return of an asset in the future, assuming the asset follows a Brownian motion random walk and returns the forecast percent return given the cumulative probability level.

370. B2ForecastDistributionReturnsPercentile
Computes the cumulative probability or percentile of an asset's returns in the future, assuming the asset follows a Brownian motion random walk and returns the forecast cumulative percentile given the return.

371. B2ForecastJumpDiffusionSimulatedSeries
Computes the entire time-series of a jump-diffusion stochastic process forecast values.

372. B2ForecastMeanReversionSimulatedSeries
Computes the entire time-series of a mean-reverting stochastic process forecast values.

373. B2ForecastIncrementalFinancialNeeds
Computes the incremental funds required to cover the projected organic sales growth of the company based on the projected year’s financials.

374. B2ForecastIncrementalPercentSalesGrowthFinancedExternally
Computes the incremental funds as a percent of sales growth that is required from external funding to cover the projected organic sales growth of the company.

375. B2ForeignEquityDomesticCurrencyCall
Computes the value of a foreign-based equity call option struck in a domestic currency and accounting for the exchange rate volatility.

376. B2ForeignEquityDomesticCurrencyPut
Computes the value of a foreign-based equity put option struck in a domestic currency and accounting for the exchange rate volatility.

377. B2ForeignEquityFixedFXRateDomesticValueQuantoCall
Quanto call options are denominated in another currency than the underlying asset, with expanding or contracting protection coverage of the foreign exchange rates.

378. B2ForeignEquityFixedFXRateDomesticValueQuantoPut
Quanto put options are denominated in another currency than the underlying asset, with expanding or contracting protection coverage of the foreign exchange rates.

379. B2ForwardRate
Computes the Forward Interest Rate given two Spot Rates.

380. B2ForwardStartCallOption
Starts proportionally in or out of the money in the future. Alpha < 1: call starts (1 – A)% in the money, put starts (1 – A)% out of the money. Alpha > 1: call (A – 1)% out of the money, put (A – 1)% in the money.

381. B2ForwardStartPutOption
Starts proportionally in or out of the money in the future. Alpha < 1: call starts (1 – A)% in the money, put starts (1 – A)% out of the money. Alpha > 1: call (A – 1)% out of the money, put (A – 1)% in the money.

382. B2FuturesForwardsCallOption
Similar to a regular option but the underlying asset is a futures of a forward contract. A call option is the option to buy a futures contract, with the specified futures strike price at which the futures is traded if the option is exercised.

383. B2FuturesForwardsPutOption
Similar to a regular option but the underlying asset is a futures of a forward contract. A put option is the option to sell a futures contract, with the specified futures strike price at which the futures is traded if the option is exercised.

384. B2FuturesSpreadCall
The payoff of a spread option is the difference between the two futures' values at expiration. The spread is Futures 1 – Futures 2, and the call payoff is Spread – Strike.

385. B2FuturesSpreadPut
The payoff of a spread option is the difference between the two futures' values at expiration. The spread is Futures 1 – Futures 2, and the put payoff is Strike – Spread.

386. B2GARCH
Computes the forward-looking volatility forecast using the generalized autoregressive conditional heteroskedasticity (p, q) model where future volatilities are forecast based on historical price levels and information.

387. B2GapCallOption
The call option is knocked in if the asset exceeds the reference Strike 1, and the option payoff is the asset price less Strike 2 for the underlying.

388. B2GapPutOption
The put option is knocked in only if the underlying asset is less than the reference Strike 1, providing a payoff of Strike 2 less the underlying asset value.

389. B2GeneralizedBlackScholesCall
Returns the Black-Scholes model with a continuous dividend yield call option.

390. B2GeneralizedBlackScholesCallCashDividends
Modification of the Generalized Black-Scholes model to solve European call options, assuming a series of dividend cash flows that may be even or uneven. A series of dividend payments and time are required.

391. B2GeneralizedBlackScholesPut
Returns the Black-Scholes model with a continuous dividend yield put option.

392. B2GeneralizedBlackScholesPutCashDividends
Modification of the Generalized Black-Scholes model to solve European put options, assuming a series of dividend cash flows that may be even or uneven. A series of dividend payments and time are required.

393. B2GraduatedBarrierDownandInCall
Barriers are graduated ranges between lower and upper values. The option is knocked in the money proportionally depending on how low the asset value is in the range.

394. B2GraduatedBarrierDownandOutCall
Barriers are graduated ranges between lower and upper values. The option is knocked out of the money proportionally depending on how low the asset value is in the range.

395. B2GraduatedBarrierUpandInPut
Barriers are graduated ranges between lower and upper values. The option is knocked in the money proportionally depending on how high the asset value is in the range.

396. B2GraduatedBarrierUpandOutPut
Barriers are graduated ranges between lower and upper values. The option is knocked out of the money proportionally depending on how high the asset value is in the range.

397. B2ImpliedVolatilityBestCase
Computes the implied volatility given an expected value of an asset, along with an alternative best-case scenario value and its corresponding percentile (must be above 50%).

398. B2ImpliedVolatilityCall
Computes the implied volatility in a European call option given all the inputs parameters and the option value.

399. B2ImpliedVolatilityPut
Computes the implied volatility in a European put option given all the inputs parameters and the option value.

400. B2ImpliedVolatilityWorstCase
Computes the implied volatility given an expected value of an asset, along with an alternative worst-case scenario value and its corresponding percentile (must be below 50%).

401. B2InterestAnnualtoPeriodic
Computes the periodic compounding rate based on the annualized compounding interest rate per year.

402. B2InterestCaplet
Computes the interest rate caplet (sum all the caplets into the total value of the interest rate cap) and acts like an interest rate call option.

403. B2InterestContinuousToDiscrete
Returns the corresponding discrete compounding interest rate, given the continuous compounding rate.

404. B2InterestContinuousToPeriodic
Computes the periodic compounding interest rate based on a continuous compounding rate.

405. B2InterestDiscreteToContinuous
Returns the corresponding continuous compounding interest rate, given the discrete compounding rate.

406. B2InterestFloorlet
Computes the interest rate floorlet (sum all the floorlets into the total value of the interest rate floor) and acts like an interest rate put option.

407. B2InterestPeriodictoAnnual
Computes the annualized compounding interest rate per year based on a periodic compounding rate.

408. B2InterestPeriodictoContinuous
Computes the continuous compounding rate based on the periodic compounding interest rate.

409. B2InverseGammaCallOption
Computes the European call option assuming an inverse Gamma distribution, rather than a normal distribution, and is important for deep out-of-the-money options.

410. B2InverseGammaPutOption
Computes the European put option assuming an inverse Gamma distribution, rather than a normal distribution, and is important for deep out-of-the-money options.

411. B2IRRContinuous
Returns the continuously discounted Internal Rate of Return for a cash flow series with its respective cash flow times in years.

412. B2IRRDiscrete
Returns the discretely discounted Internal Rate of Return for a cash flow series with its respective cash flow times in years.

413. B2LinearInterpolation
Interpolates and fills in the missing values of a time series.

414. B2MarketPriceRisk
Computes the market price of risk used in a variety of options analyses, using market return, risk-free return, volatility of the market, and correlation between the market and the asset.

415. B2MathGammaLog
Returns the result from a log gamma function.

416. B2MathIncompleteBeta
Returns the result from an incomplete Beta function.

417. B2MathIncompleteGammaP
Returns the result from an incomplete Gamma P function.

418. B2MathIncompleteGammaQ
Returns the result from an incomplete Gamma Q function.

419. B2MatrixMultiplyAxB
Multiplies two compatible matrices, such as $M \times N$ and $N \times M$, to create an $M \times M$ matrix. Copy and paste function and use Ctrl+Shift+Enter to obtain the matrix.

420. B2MatrixMultiplyAxTransposeB
Multiplies the first matrix with the transpose of the second matrix (multiplies $M \times N$ with $M \times N$ matrix by transposing the second matrix to $N \times M$, generating an $M \times M$ matrix). Copy and paste function and use Ctrl+Shift+Enter to obtain the matrix.

421. B2MatrixMultiplyTransposeAxB
Multiplies the transpose of the first matrix with the second matrix (multiplies $M \times N$ with $M \times N$ matrix by transposing the first matrix to $N \times M$, generating an $N \times N$ matrix). Copy and paste function and use Ctrl+Shift+Enter to obtain the matrix.

422. B2MatrixTranspose
Transposes a matrix from $M \times N$ to $N \times M$. Copy and paste function and use Ctrl+Shift+Enter to obtain the matrix.

423. B2MertonJumpDiffusionCall
Call value of an underlying whose asset returns are assumed to follow a Poisson Jump Diffusion process; that is, prices jump several times a year, and cumulatively these jumps explain a percentage of the total asset volatility.

424. B2MertonJumpDiffusionPut
Put value of an underlying whose asset returns are assumed to follow a Poisson Jump Diffusion process; that is, prices jump several times a year, and cumulatively these jumps explain a percentage of the total asset volatility.

425. B2NormalTransform
Converts values into a normalized distribution.

426. B2NPVContinuous
Returns the Net Present Value of a cash flow series given the time and discount rate, using continuous discounting.

427. B2NPVDiscrete
Returns the Net Present Value of a cash flow series given the time and discount rate, using discrete discounting.

428. B2OptionStrategyLongBearCreditSpread
Returns the matrix [stock price, buy put, sell put, profit] of a long bearish credit spread (buying a higher strike put with a high price and selling a lower strike put with a low price).

429. B2OptionStrategyLongBullCreditSpread
Returns the matrix [stock price, buy put, sell put, profit] of a bullish credit spread (buying a lower strike put at a low price and selling a higher strike put at a high price).

430. B2OptionStrategyLongBearDebitSpread
Returns the matrix [stock price, buy call, sell call, profit] of a long bearish debit spread (buying a higher strike call with a low price and selling a lower strike call with a high price).

431. B2OptionStrategyLongBullDebitSpread
Returns the matrix [stock price, buy call, sell call, profit] of a bullish debit spread (buying a lower strike call at a high price and selling a further out-of-the-money higher strike call at a low price).

432. B2OptionStrategyLongCoveredCall
Returns the matrix [stock price, buy stock, sell call, profit] of a long covered call position (buying the stock and selling a call of the same asset).

433. B2OptionStrategyLongProtectivePut
Returns the matrix [stock price, buy stock, buy put, profit] of a long protective put position (buying the stock and buying a put of the same asset).

434. B2OptionStrategyLongStraddle
Returns the matrix [stock price, buy call, buy put, profit] of a long straddle position (buying an equal number of puts and calls with identical strike price and expiration) to profit from high volatility.

435. B2OptionStrategyLongStrangle
Returns the matrix [stock price, buy call, buy put, profit] of a long strangle (buying a higher strike call at a low price and buying a lower strike put at a low price—close expirations) to profit from high volatility.

436. B2OptionStrategyWriteCoveredCall
Returns the matrix [stock price, sell stock, buy call, profit] of writing a covered call (selling the stock and buying a call of the same asset).

437. B2OptionStrategyWriteProtectivePut
Returns the matrix [stock price, sell stock, sell put, profit] of a long protective put position (selling the stock and selling a put of the same asset).

438. B2OptionStrategyWriteStraddle
Returns the matrix [stock price, sell call, sell put, profit] of writing a straddle position (selling an equal number of puts and calls with identical strike price and expiration) to profit from low volatility.

439. B2OptionStrategyWriteStrangle
Returns the matrix [stock price, sell call, sell put, profit] of writing a strangle (sell a higher strike call at a low price and sell a lower strike put at a low price—close expirations) to profit from low volatility.

440. B2Payback
Computes the payback in years given some initial investment and subsequent cash flows.

441. B2PerpetualCallOption
Computes the American perpetual call option. Note that it returns an error if dividend is 0% (this is because the American option reverts to European and a perpetual European has no value).

442. B2PerpetualPutOption
Computes the American perpetual put option. Note that it returns an error if dividend is 0% (this is because the American option reverts to European and a perpetual European has no value).

443. B2PortfolioReturns
Computes the portfolio weighted average expected returns given individual asset returns and allocations.

444. B2PortfolioRisk
Computes the portfolio risk given individual asset allocations and variance-covariance matrix.

445. B2PortfolioVariance
Computes the portfolio variance given individual asset allocations and variance-covariance matrix. Take the square root of the result to obtain the portfolio risk.

446. B2ProbabilityDefaultAdjustedBondYield
Computes the required risk-adjusted yield (premium spread plus risk-free rate) to charge given the cumulative probability of default.

447. B2ProbabilityDefaultAverageDefaults
Credit Risk Plus' average number of credit defaults per period using total portfolio credit exposures, average cumulative probability of default, and percentile Value at Risk for the portfolio.

448. B2ProbabilityDefaultCorrelation
Computes the correlations of default probabilities given the probabilities of default of each asset and the correlation between their equity prices. The result is typically much smaller than the equity correlation.

449. B2ProbabilityDefaultCumulativeBondYieldApproach
Computes the cumulative probability of default from Year 0 to Maturity using a comparable zero bond yield versus a zero risk-free yield and accounting for a recovery rate.

450. B2ProbabilityDefaultCumulativeSpreadApproach
Computes the cumulative probability of default from Year 0 to Maturity using a comparable risky debt's spread (premium) versus the risk-free rate and accounting for a recovery rate.

451. B2ProbabilityDefaultHazardRate
Computes the hazard rate for a specific year (in survival analysis) using a comparable zero bond yield versus a zero risk-free yield and accounting for a recovery rate.

452. B2ProbabilityDefaultMertonDefaultDistance
Distance to Default (does not require market returns and correlations but requires the internal growth rates).

453. B2ProbabilityDefaultMertonI
Probability of Default (without regard to Equity Value or Equity Volatility, but requires asset, debt, and market values).

454. B2ProbabilityDefaultMertonII
Probability of Default (does not require market returns and correlations but requires the internal growth rates).

455. B2ProbabilityDefaultMertonImputedAssetValue
Returns the imputed market value of asset given external equity value, equity volatility, and other option inputs. Used in the Merton probability of default model.

456. B2ProbabilityDefaultMertonImputedAssetVolatility
Returns the imputed volatility of asset given external equity value, equity volatility, and other option inputs. Used in the Merton probability of default model.

457. B2ProbabilityDefaultMertonMVDebt
Computes the market value of debt (for risky debt) in the Merton-based simultaneous options model.

458. B2ProbabilityDefaultMertonRecoveryRate
Computes the rate of recovery in percent for risky debt in the Merton-based simultaneous options model.

459. B2ProbabilityDefaultPercentileDefaults
Credit Risk Plus method to compute the percentile given some estimated average number of defaults per period.

460. B2PropertyDepreciation
Value of the periodic depreciation allowed on a commercial real estate project, given the percent of price going to improvement and the allowed recovery period.

461. B2PropertyEquityRequired
Value of the required equity down payment on a commercial real estate project, given the valuation of the project.

462. B2PropertyLoanAmount
Value of the required mortgage amount on a commercial real estate project, given the value of the project and the loan required (loan-to-value ratio or the percentage of the value that a loan represents is required).

463. B2PropertyValuation
Value of a commercial real estate property assuming Gross Rent, Vacancy, Operating Expenses, and the Cap Rate at Purchase Date (Net Operating Income/Sale Price).

464. B2PutCallParityCalltoPut
Computes the European put option value given the value of a corresponding European call option with identical input assumptions.

465. B2PutCallParityCalltoPutCurrencyOptions
Computes the European currency put option value given the value of a corresponding European currency call option on futures and forwards with identical input assumptions.

466. B2PutCallParityCalltoPutFutures
Computes the value of a European put option on futures and forwards given the value of a corresponding European call option on futures and forwards with identical input assumptions.

467. B2PutCallParityPuttoCall
Computes the European call option value given the value of a corresponding European put option with identical input assumptions.

468. B2PutCallParityPuttoCallCurrencyOptions
Computes the value of a European currency call option given the value of a corresponding European currency put option on futures and forwards with identical input assumptions.

469. B2PutCallParityPuttoCallFutures
Computes the value of a European call option on futures and forwards given the value of a corresponding European put option on futures and forwards with identical input assumptions.

470. B2PutDelta
Returns the option valuation sensitivity Delta (a put option value's sensitivity to changes in the asset value).

471. B2PutGamma
Returns the option valuation sensitivity Gamma (a put option value's sensitivity to changes in the Delta value).

472. B2PutOptionOnTheMax
The maximum values at expiration of both assets are used in option exercise, where the call option payoff at expiration is the strike price against the maximum price between Asset 1 and Asset 2.

473. B2PutOptionOnTheMin
The minimum values at expiration of both assets are used in option exercise, where the call option payoff at expiration is the strike price against the minimum price between Asset 1 and Asset 2.

474. B2PutRho
Returns the option valuation sensitivity Rho (a put option value's sensitivity to changes in the interest rate).

475. B2PutTheta
Returns the option valuation sensitivity Theta (a put option value's sensitivity to changes in the maturity).

476. B2PutVega
Returns the option valuation sensitivity Vega (a put option value's sensitivity to changes in the volatility).

477. B2QueuingMCAveCustomersinSystem
Average number of customers in the system, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

478. B2QueuingMCAveCustomersWaiting
Average number of customers in the waiting line, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

479. B2QueuingMCAveTimeinSystem
Average time a customer spends in the system, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

480. B2QueuingMCAveTimeWaiting
Average time a customer spends in the waiting line, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

481. B2QueuingMCProbHaveToWait
Probability an arriving customer has to wait, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

482. B2QueuingMCProbNoCustomer
Probability that no customers are in the system, using a multiple-channel queuing model assuming a Poisson arrival rate with Exponential distribution of service times.

483. B2QueuingMGKAveCustomersinSystem
Average number of customers in the system, using a multiple-channel queuing model assuming a Poisson arrival rate with unknown distribution of service times.

484. B2QueuingMGKCostPerPeriod
Total cost per time period, using a multiple-channel queuing model assuming a Poisson arrival rate with unknown distribution of service times.

485. B2QueuingMGKProbBusy
Probability a channel will be busy, using a multiple-channel queuing model assuming a Poisson arrival rate with unknown distribution of service times.

486. B2QueuingSCAAveCustomersinSystem
Average number of customers in the system, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

487. B2QueuingSCAAveCustomersWaiting
Average number of customers in the waiting line, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

488. B2QueuingSCAAveTimeinSystem
Average time a customer spends in the system, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

489. B2QueuingSCAAveTimeWaiting
Average time a customer spends in the waiting line, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

490. B2QueuingSCAProbHaveToWait
Probability an arriving customer has to wait, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

491. B2QueuingSCAProbNoCustomer
Probability that no customers are in the system, using an MG1 single-channel arbitrary queuing model assuming a Poisson arrival rate with unknown distribution of service times.

492. B2QueuingSCAveCustomersinSystem
Average number of customers in the system, using a single-channel queuing model.

493. B2QueuingSCAveCustomersWaiting
Returns the average number of customers in the waiting line, using a single-channel queuing model.

494. B2QueuingSCAveTimeinSystem
Average time a customer spends in the system, using a single-channel queuing model.

495. B2QueuingSCAveTimeWaiting
Average time a customer spends in the waiting line, using a single-channel queuing model.

496. B2QueuingSCProbHaveToWait
Probability an arriving customer has to wait, using a single-channel queuing model.

497. B2QueuingSCProbNoCustomer
Returns the probability that no customers are in the system, using a single-channel queuing model.

498. B2RatiosBasicEarningPower
Computes the basic earning power (BEP) by accounting for earnings before interest and taxes (EBIT) and the amount of total assets employed.

499. B2RatiosBetaLevered
Computes the levered beta from an unlevered beta level after accounting for the tax rate, total debt, and equity values.

500. B2RatiosBetaUnlevered
Computes the unlevered beta from a levered beta level after accounting for the tax rate, total debt, and equity values.

501. B2RatiosBookValuePerShare
Computes the book value per share (BV) by accounting for the total common equity amount and number of shares outstanding.

502. B2RatiosCapitalCharge
Computes the capital charge value (typically used to compute the economic profit of a project).

503. B2RatiosCAPM
Computes the capital asset pricing model's required rate of return in percent, given some benchmark market return, beta risk coefficient, and risk-free rate.

504. B2RatiosCashFlowtoEquityLeveredFirm
Cash flow to equity for a levered firm (accounting for operating expenses, taxes, depreciation, amortization, capital expenditures, change in working capital, preferred dividends, principal repaid, and new debt issues).

505. B2RatiosCashFlowtoEquityUnleveredFirm
Cash flow to equity for an unlevered firm (accounting for operating expenses, taxes, depreciation, amortization, capital expenditures, change in working capital, and taxes).

506. B2RatiosCashFlowtoFirm
Cash flow to the firm (accounting for earnings before interest and taxes [EBIT], tax rate, depreciation, capital expenditures, and change in working capital).

507. B2RatiosCashFlowtoFirm2
Cash flow to the firm (accounting for net operating profit after taxes [NOPAT], depreciation, capital expenditures, and change in working capital).

508. B2RatiosContinuingValue1
Computes the continuing value based on a constant growth rate of free cash flows to perpetuity using a Gordon Growth Model.

509. B2RatiosContinuingValue2
Computes the continuing value based on a constant growth rate of free cash flows to perpetuity using net operating profit after taxes (NOPAT), return on invested capital (ROIC), growth rate, and current free cash flow.

510. B2RatiosCostEquity
Computes the cost of equity (as used in a CAPM model) using the dividend rate, growth rate of dividends, and current equity price.

511. B2RatiosCurrentRatio
Computes the current ratio by accounting for the individual asset and liabilities.

512. B2RatiosDaysSalesOutstanding
Computes the days sales outstanding by looking at the accounts receivable value, total annual sales, and number of days per year.

513. B2RatiosDebtAssetRatio
Computes the debt-to-asset ratio by accounting for the total debt and total asset values.

514. B2RatiosDebtEquityRatio
Computes the debt-to-equity ratio by accounting for the total debt and total common equity levels.

515. B2RatiosDebtRatio1
Computes the debt ratio by accounting for the total debt and total asset values.

516. B2RatiosDebtRatio2
Computes the debt ratio by accounting for the total equity and total asset values.

517. B2RatiosDividendsPerShare
Computes the dividends per share (DPS) by accounting for the dividend payment amount and number of shares outstanding.

518. B2RatiosEarningsPerShare
Computes the earnings per share (EPS) by accounting for the net income amount and number of shares outstanding.

519. B2RatiosEconomicProfit1
Computes the economic profit using invested capital, return on invested capital (ROIC), and weighted average cost of capital (WACC).

520. B2RatiosEconomicProfit2
Computes the economic profit using net operating profit after taxes (NOPAT), return on invested capital (ROIC), and weighted average cost of capital (WACC).

521. B2RatiosEconomicProfit3
Computes the economic profit using net operating profit after taxes (NOPAT) and capital charge.

522. B2RatiosEconomicValueAdded
Computes the economic value added using earnings before interest and taxes (EBIT), total capital employed, tax rate, and weighted average cost of capital (WACC).

523. B2RatiosEquityMultiplier
Computes the equity multiplier (the ratio of total assets to total equity).

524. B2RatiosFixedAssetTurnover
Computes the fixed asset turnover by accounting for the annual sales levels and net fixed assets.

525. B2RatiosInventoryTurnover
Computes the inventory turnover using sales and inventory levels.

526. B2RatiosMarketBookRatio1
Computes the market to book value (BV) per share by accounting for the share price and the book value per share.

527. B2RatiosMarketBookRatio2
Computes the market to book value per share by accounting for the share price, total common equity value, and number of shares outstanding.

528. B2RatiosMarketValueAdded
Computes the market value added by accounting for the stock price, total common equity, and number of shares outstanding.

529. B2RatiosNominalCashFlow
Computes the nominal cash flow amount assuming some inflation rate, real cash flow, and the number of years in the future.

530. B2RatiosNominalDiscountRate
Computes the nominal discount rate assuming some inflation rate and real discount rate.

531. B2RatiosPERatio1
Computes the price-to-earnings (P/E) ratio using stock price and earnings per share (EPS).

532. B2RatiosPERatio2
Computes the price-to-earnings (P/E) ratio using stock price, net income, and number of shares outstanding.

533. B2RatiosPERatio3
Computes the price-to-earnings (P/E) ratio using growth rates, rate of return, and discount rate.

534. B2RatiosProfitMargin
Computes the profit margin by taking the ratio of net income to annual sales.

535. B2RatiosQuickRatio
Computes the quick ratio by accounting for the individual assets and liabilities.

536. B2RatiosRealCashFlow
Computes the real cash flow amount assuming some inflation rate, nominal cash flow (Nominal CF), and the number of years in the future.

537. B2RatiosRealDiscountRate
Computes the real discount rate assuming some inflation rate and nominal discount rate.

538. B2RatiosReturnonAsset1
Computes the return on assets using net income amount and total assets employed.

539. B2RatiosReturnonAsset2
Computes the return on assets using net profit margin percentage and total asset turnover ratio.

540. B2RatiosReturnonEquity1
Computes return on equity using net income and total common equity values.

541. B2RatiosReturnonEquity2
Computes return on equity using return on assets (ROA), total assets, and total equity values.

542. B2RatiosReturnonEquity3
Computes return on equity using net income, total sales, total assets, and total common equity values.

543. B2RatiosReturnonEquity4
Computes return on equity using net profit margin, total asset turnover, and equity multiplier values.

544. B2RatiosROIC
Computes the return on invested capital (typically used for computing economic profit) accounting for change in working capital; property, plant, and equipment (PPE); and other assets.

545. B2RatiosShareholderEquity
Computes the common shareholder's equity after accounting for total assets, total liabilities, and preferred stocks.

546. B2RatiosTimesInterestEarned
Computes the times interest earned ratio by accounting for earnings before interest and taxes (EBIT) and the amount of interest payment.

547. B2RatiosTotalAssetTurnover
Computes the total asset turnover by accounting for the annual sales levels and total assets.

548. B2RatiosWACC1
Computes the weighted average cost of capital (WACC) using market values of debt, preferred equity, and common equity, as well as their respective costs.

549. B2RatiosWACC2
Computes the weighted average cost of capital (WACC) using market values of debt, market values of common equity, as well as their respective costs.

550. B2ROBinomialAmericanAbandonContract
Returns the American option to abandon and contract using a binomial lattice model.

551. B2ROBinomialAmericanAbandonContractExpand
Returns the American option to abandon, contract, and expand using a binomial lattice model.

552. B2ROBinomialAmericanAbandonExpand
Returns the American option to abandon and expand using a binomial lattice model.

553. B2ROBinomialAmericanAbandonment
Returns the American option to abandon using a binomial lattice model.

554. B2ROBinomialAmericanCall
Returns the American call option with dividends using a binomial lattice model.

555. B2ROBinomialAmericanChangingRiskFree
Returns the American call option with dividends and assuming the risk-free rate changes over time, using a binomial lattice model.

556. B2ROBinomialAmericanChangingVolatility
Returns the American call option with dividends and assuming the volatility changes over time, using a binomial lattice model. Use small number of steps or it will take a long time to compute!

557. B2ROBinomialAmericanContractExpand
Returns the American option to contract and expand using a binomial lattice model.

558. B2ROBinomialAmericanContraction
Returns the American option to contract using a binomial lattice model.

559. B2ROBinomialAmericanCustomCall
Returns the American option call option with changing inputs, vesting periods, and suboptimal exercise multiple using a binomial lattice model.

560. B2ROBinomialAmericanExpansion
Returns the American option to expand using a binomial lattice model.

561. B2ROBinomialAmericanPut
Returns the American put option with dividends using a binomial lattice model.

562. B2ROBinomialBermudanAbandonContract
Returns the Bermudan option to abandon and contract using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

563. B2ROBinomialBermudanAbandonContractExpand
Returns the Bermudan option to abandon, contract, and expand, using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

564. B2ROBinomialBermudanAbandonExpand
Returns the Bermudan option to abandon and expand using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

565. B2ROBinomialBermudanAbandonment
Returns the Bermudan option to abandon using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

566. B2ROBinomialBermudanCall
Returns the Bermudan call option with dividends, where there is a vesting/blackout period during which the option cannot be executed.

567. B2ROBinomialBermudanContractExpand
Returns the Bermudan option to contract and expand, using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

568. B2ROBinomialBermudanContraction
Returns the Bermudan option to contract using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

569. B2ROBinomialBermudanExpansion
Returns the Bermudan option to expand using a binomial lattice model, where there is a vesting/blackout period during which the option cannot be executed.

570. B2ROBinomialBermudanPut
Returns the Bermudan put option with dividends, where there is a vesting/blackout period during which the option cannot be executed.

571. B2ROBinomialEuropeanAbandonContract
Returns the European option to abandon and contract, using a binomial lattice model, where the option can be executed only at expiration.

572. B2ROBinomialEuropeanAbandonContractExpand
Returns the European option to abandon, contract, and expand, using a binomial lattice model, where the option can be executed only at expiration.

573. B2ROBinomialEuropeanAbandonExpand
Returns the European option to abandon and expand, using a binomial lattice model, where the option can be executed only at expiration.

574. B2ROBinomialEuropeanAbandonment
Returns the European option to abandon using a binomial lattice model, where the option can be executed only at expiration.

575. B2ROBinomialEuropeanCall
Returns the European call option with dividends, where the option can be executed only at expiration.

576. B2ROBinomialEuropeanContractExpand
Returns the European option to contract and expand, using a binomial lattice model, where the option can be executed only at expiration.

577. B2ROBinomialEuropeanContraction
Returns the European option to contract using a binomial lattice model, where the option can be executed only at expiration.

578. B2ROBinomialEuropeanExpansion
Returns the European option to expand using a binomial lattice model, where the option can be executed only at expiration.

579. B2ROBinomialEuropeanPut
Returns the European put option with dividends, where the option can be executed only at expiration.

580. B2ROJumpDiffusionCall
Returns the closed-form model for a European call option whose underlying asset follows a Poisson Jump Diffusion process.

581. B2ROJumpDiffusionPut
Returns the closed-form model for a European put option whose underlying asset follows a Poisson Jump Diffusion process.

582. B2ROMeanRevertingCall
Returns the closed-form model for a European call option whose underlying asset follows a mean-reversion process.

583. B2ROMeanRevertingPut
Returns the closed-form model for a European put option whose underlying asset follows a mean-reversion process.

584. B2ROPentanomialAmericanCall
Returns the Rainbow American call option with two underlying assets (these are typically price and quantity, and are multiplied together to form a new combinatorial pentanomial lattice).

585. B2ROPentanomialAmericanPut
Returns the Rainbow American put option with two underlying assets (these are typically price and quantity, and are multiplied together to form a new combinatorial pentanomial lattice).

586. B2ROPentanomialEuropeanCall
Returns the Rainbow European call option with two underlying assets (these are typically price and quantity, and are multiplied together to form a new combinatorial pentanomial lattice).

587. B2ROPentanomialEuropeanPut
Returns the Rainbow European put option with two underlying assets (these are typically price and quantity, and are multiplied together to form a new combinatorial pentanomial lattice).

588. B2ROQuadranomialJumpDiffusionAmericanCall
Returns the American call option whose underlying asset follows a Poisson Jump Diffusion process, using a combinatorial quadranomial lattice.

589. B2ROQuadranomialJumpDiffusionAmericanPut
Returns the American put option whose underlying asset follows a Poisson Jump Diffusion process, using a combinatorial quadranomial lattice.

590. B2ROQuadranomialJumpDiffusionEuropeanCall
Returns the European call option whose underlying asset follows a Poisson Jump Diffusion process, using a combinatorial quadranomial lattice.

591. B2ROQuadranomialJumpDiffusionEuropeanPut
Returns the European put option whose underlying asset follows a Poisson Jump Diffusion process, using a combinatorial quadranomial lattice.

592. B2ROStateAmericanCall
Returns the American call option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model.

593. B2ROStateAmericanPut
Returns the American put option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model.

594. B2ROStateBermudanCall
Returns the Bermudan call option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model, and where the option cannot be exercised during certain vesting/blackout periods.

595. B2ROStateBermudanPut
Returns the Bermudan put option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model, and where the option cannot be exercised during certain vesting/blackout periods.

596. B2ROStateEuropeanCall
Returns the European call option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model, and where the option can be exercised only at maturity.

597. B2ROStateEuropeanPut
Returns the European put option using a state jump function, where the up and down states can be asymmetrical, solved in a lattice model, and where the option can be exercised only at maturity.

598. B2ROTrinomialAmericanCall
Returns the American call option with dividend, solved using a trinomial lattice.

599. B2ROTrinomialAmericanMeanRevertingCall
Returns the American call option with dividend, assuming the underlying asset is mean-reverting, and solved using a trinomial lattice.

600. B2ROTrinomialAmericanMeanRevertingPut
Returns the American put option with dividend, assuming the underlying asset is mean-reverting, and solved using a trinomial lattice.

601. B2ROTrinomialAmericanPut
Returns the American put option with dividend, solved using a trinomial lattice.

602. B2ROTrinomialBermudanCall
Returns the Bermudan call option with dividend, solved using a trinomial lattice, where during certain vesting/blackout periods the option cannot be exercised.

603. B2ROTrinomialBermudanPut
Returns the Bermudan put option with dividend, solved using a trinomial lattice, where during certain vesting/blackout periods the option cannot be exercised.

604. B2ROTrinomialEuropeanCall
Returns the European call option with dividend, solved using a trinomial lattice, where the option can be exercised only at maturity.

605. B2ROTrinomialEuropeanMeanRevertingCall
Returns the European call option with dividend, solved using a trinomial lattice, assuming the underlying asset is mean-reverting, and where the option can be exercised only at maturity.

606. B2ROTrinomialEuropeanMeanRevertingPut
Returns the European put option with dividend, solved using a trinomial lattice, assuming the underlying asset is mean-reverting, and where the option can be exercised only at maturity.

607. B2ROTrinomialEuropeanPut
Returns the European put option with dividend, solved using a trinomial lattice, where the option can be exercised only at maturity.

608. B2SCurveValue
Computes the S-Curve extrapolation's next forecast value based on previous value, growth rate, and maximum capacity levels.

609. B2SCurveValueSaturation
Computes the S-Curve extrapolation's saturation level based on previous value, growth rate, and maximum capacity levels.

610. B2SemiStandardDeviationPopulation
Computes the semi-standard deviation of the population; that is, only the values below the mean are used to compute an adjusted population standard deviation, a more appropriate measure of downside risk.

611. B2SemiStandardDeviationSample
Computes the semi-standard deviation of the sample; that is, only the values below the mean are used to compute an adjusted sample standard deviation, a more appropriate measure of downside risk.

612. B2SharpeRatio
Computes the Sharpe Ratio (returns-to-risk ratio) based on a series of stock prices of an asset and a market benchmark series of prices.

613. B2SimulateBernoulli
Returns simulated random numbers from the Bernoulli distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

614. B2SimulateBeta
Returns simulated random numbers from the Beta distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

615. B2SimulateBinomial
Returns simulated random numbers from the Binomial distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

616. B2SimulateChiSquare
Returns simulated random numbers from the Chi-Square distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

617. B2SimulatedEuropeanCall
Returns the Monte Carlo simulated European call option (only European options can be approximated well with simulation). This function is volatile.

618. B2SimulatedEuropeanPut
Returns the Monte Carlo simulated European put option (only European options can be approximated well with simulation). This function is volatile.

619. B2SimulateDiscreteUniform
Returns simulated random numbers from the Discrete Uniform distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

620. B2SimulateExponential
Returns simulated random numbers from the Exponential distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

621. B2SimulateFDist
Returns simulated random numbers from the F distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

622. B2SimulateGamma
Returns simulated random numbers from the Gamma distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

623. B2SimulateGeometric
Returns simulated random numbers from the Geometric distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

624. B2SimulateGumbelMax
Returns simulated random numbers from the Gumbel Max distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

625. B2SimulateGumbelMin
Returns simulated random numbers from the Gumbel Min distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

626. B2SimulateLogistic
Returns simulated random numbers from the Logistic distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

627. B2SimulateLognormal
Returns simulated random numbers from the Lognormal distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

628. B2SimulateNormal
Returns simulated random numbers from the Normal distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

629. B2SimulatePareto
Returns simulated random numbers from the Pareto distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

630. B2SimulatePoisson
Returns simulated random numbers from the Poisson distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

631. B2SimulateRayleigh
Returns simulated random numbers from the Rayleigh distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

632. B2SimulateStandardNormal
Returns simulated random numbers from the Standard Normal distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

633. B2SimulateTDist
Returns simulated random numbers from the Student's T distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

634. B2SimulateTriangular
Returns simulated random numbers from the Triangular distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

635. B2SimulateUniform
Returns simulated random numbers from the Uniform distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

636. B2SimulateWeibull
Returns simulated random numbers from the Weibull distribution. Type in RAND() as the random input parameter to generate volatile random values from this distribution.

637. B2SixSigmaControlCChartCL
Computes the center line in a control c-chart. C-charts are applicable when only the number of defects is important.

638. B2SixSigmaControlCChartDown1Sigma
Computes the lower 1 sigma limit in a control c-chart. C-charts are applicable when only the number of defects is important.

639. B2SixSigmaControlCChartDown2Sigma
Computes the lower 2 sigma limit in a control c-chart. C-charts are applicable when only the number of defects is important.

640. B2SixSigmaControlCChartLCL
Computes the lower control limit in a control c-chart. C-charts are applicable when only the number of defects is important.

641. B2SixSigmaControlCChartUCL
Computes the upper control limit in a control c-chart. C-charts are applicable when only the number of defects is important.

642. B2SixSigmaControlCChartUp1Sigma
Computes the upper 1 sigma limit in a control c-chart. C-charts are applicable when only the number of defects is important.

643. B2SixSigmaControlCChartUp2Sigma
Computes the upper 2 sigma limit in a control c-chart. C-charts are applicable when only the number of defects is important.

644. B2SixSigmaControlNPChartCL
Computes the center line in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

645. B2SixSigmaControlNPChartDown1Sigma
Computes the lower 1 sigma limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

646. B2SixSigmaControlNPChartDown2Sigma
Computes the lower 2 sigma limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

647. B2SixSigmaControlNPChartLCL
Computes the lower control limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

648. B2SixSigmaControlNPChartUCL
Computes the upper control limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

649. B2SixSigmaControlNPChartUp1Sigma
Computes the upper 1 sigma limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

650. B2SixSigmaControlNPChartUp2Sigma
Computes the upper 2 sigma limit in a control np-chart. NP-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes is constant.

651. B2SixSigmaControlPChartCL
Computes the center line in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

652. B2SixSigmaControlPChartDown1Sigma
Computes the lower 1 sigma limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

653. B2SixSigmaControlPChartDown2Sigma
Computes the lower 2 sigma limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

654. B2SixSigmaControlPChartLCL
Computes the lower control limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

655. B2SixSigmaControlPChartUCL
Computes the upper control limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

656. B2SixSigmaControlPChartUp1Sigma
Computes the upper 1 sigma limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

657. B2SixSigmaControlPChartUp2Sigma
Computes the upper 2 sigma limit in a control p-chart. P-charts are applicable when proportions of defects are important, and where in each experimental subgroup the number of sample sizes might be different.

658. B2SixSigmaControlRChartCL
Computes the center line in a control R-chart. R-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the range of the measurements is the variable plotted.

659. B2SixSigmaControlRChartLCL
Computes the lower control limit in a control R-chart. R-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the range of the measurements is the variable plotted.

660. B2SixSigmaControlRChartUCL
Computes the upper control limit in a control R-chart. R-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the range of the measurements is the variable plotted.

661. B2SixSigmaControlUChartCL
Computes the center line in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

662. B2SixSigmaControlUChartDown1Sigma
Computes the lower 1 sigma limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

663. B2SixSigmaControlUChartDown2Sigma
Computes the lower 2 sigma limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

664. B2SixSigmaControlUChartLCL
Computes the lower control limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

665. B2SixSigmaControlUChartUCL
Computes the upper control limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

666. B2SixSigmaControlUChartUp1Sigma
Computes the upper 1 sigma limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

667. B2SixSigmaControlUChartUp2Sigma
Computes the upper 2 sigma limit in a control u-chart. U-charts are applicable when the number of defects is important, and where in each experimental subgroup the number of sample sizes is the same.

668. B2SixSigmaControlXChartCL
Computes the center line in a control X-chart. X-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the average of the measurements is the variable plotted.

669. B2SixSigmaControlXChartLCL
Computes the lower control limit in a control X-chart. X-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the average of the measurements is the variable plotted.

670. B2SixSigmaControlXChartUCL
Computes the upper control limit in a control X-chart. X-charts are used when the number of defects is important; in each subgroup experiment multiple measurements are taken, and the average of the measurements is the variable plotted.

671. B2SixSigmaControlXMRChartCL
Computes the center line in a control XmR-chart. XmR-charts are used when the number of defects is important; there is only a single measurement for each sample, and a time series of moving ranges is the variable plotted.

672. B2SixSigmaControlXMRChartLCL
Computes the lower control limit in a control XmR-chart. XmR-charts are used when the number of defects is important; there is only a single measurement for each sample, and a time series of moving ranges is the variable plotted.

673. B2SixSigmaControlXMRChartUCL
Computes the upper control limit in a control XmR-chart. XmR-charts are used when the number of defects is important; there is only a single measurement for each sample, and a time series of moving ranges is the variable plotted.

674. B2SixSigmaDeltaPrecision
Computes the error precision given specific levels of Type I and Type II errors, as well as the sample size and variance.

675. B2SixSigmaSampleSize
Computes the required minimum sample size given Type I and Type II errors, as well as the required precision of the mean and the error tolerances.

676. B2SixSigmaSampleSizeDPU
Computes the required minimum sample size given Type I and Type II errors, as well as the required precision of the defects per unit and the error tolerances.

677. B2SixSigmaSampleSizeProportion
Computes the required minimum sample size given Type I and Type II errors, as well as the required precision of the proportion of defects and the error tolerances.

678. B2SixSigmaSampleSizeStdev
Computes the required minimum sample size given Type I and Type II errors, as well as the required precision of the standard deviation and the error tolerances.

679. B2SixSigmaSampleSizeZeroCorrelTest
Computes the required minimum sample size to test whether a correlation is statistically significant at an alpha of 0.05 and beta of 0.10.

680. B2SixSigmaStatCP
Computes the potential process capability index Cp given the actual mean and sigma of the process, including the upper and lower specification limits.

681. B2SixSigmaStatCPK
Computes the process capability index Cpk given the actual mean and sigma of the process, including the upper and lower specification limits.

682. B2SixSigmaStatDPMO
Computes the defects per million opportunities (DPMO) given the actual mean and sigma of the process, including the upper and lower specification limits.

683. B2SixSigmaStatDPU
Computes the proportion of defects per unit (DPU) given the actual mean and sigma of the process, including the upper and lower specification limits.

684. B2SixSigmaStatProcessSigma
Computes the process sigma level given the actual mean and sigma of the process, including the upper and lower specification limits.

685. B2SixSigmaStatYield
Computes the nondefective parts or the yield of the process, given the actual mean and sigma of the process, including the upper and lower specification limits.

686. B2SixSigmaUnitCPK
Computes the process capability index Cpk given the actual counts of defective parts and the total opportunities in the population.

687. B2SixSigmaUnitDPMO
Computes the defects per million opportunities (DPMO) given the actual counts of defective parts and the total opportunities in the population.

688. B2SixSigmaUnitDPU
Computes the proportion of defects per unit (DPU) given the actual counts of defective parts and the total opportunities in the population.

689. B2SixSigmaUnitProcessSigma
Computes the process sigma level given the actual counts of defective parts and the total opportunities in the population.

690. B2SixSigmaUnitYield
Computes the nondefective parts or the yield of the process given the actual counts of defective parts and the total opportunities in the population.

691. B2StandardNormalBivariateCDF
Given the two Z-scores and correlation, returns the value of the bivariate standard normal (means of zero, variances of 1) cumulative distribution function.

692. B2StandardNormalCDF
Given the Z-score, returns the value of the standard normal (mean of zero, variance of 1) cumulative distribution function.

693. B2StandardNormalInverseCDF
Computes the inverse cumulative distribution function of a standard normal distribution (mean of zero, variance of 1).

694. B2StandardNormalPDF
Given the Z-score, returns the value of the standard normal (mean of zero, variance of 1) probability density function.

695. B2StockIndexCallOption
Similar to a regular call option but the underlying asset is a reference stock index such as the Standard & Poor's 500. The analysis can be solved using a Generalized Black-Scholes-Merton model as well.

696. B2StockIndexPutOption
Similar to a regular put option but the underlying asset is a reference stock index such as the Standard & Poor's 500. The analysis can be solved using a Generalized Black-Scholes-Merton model as well.

697. B2SuperShareOptions
The option has value only if the stock or asset price is between the upper and lower barriers, and at expiration provides a payoff equivalent to the stock or asset price divided by the lower strike price (*S*/*X* Lower).

698. B2SwaptionEuropeanPayer
European Call Interest Swaption.

699. B2SwaptionEuropeanReceiver
European Put Interest Swaption.

700. B2TakeoverFXOption
At a successful takeover (foreign firm value in foreign currency is less than the foreign currency units), option holder can purchase the foreign units at a predetermined strike price (in exchange rates of the domestic to foreign currency).

701. B2TimeSwitchOptionCall
Holder gets AccumAmount ×TimeSteps each time asset > strike for a call. TimeSteps is the frequency at which the asset price is checked as to whether the strike is breached (e.g., for 252 trading days, set DT as 1/252).

702. B2TimeSwitchOptionPut
Holder gets AccumAmount × TimeSteps each time asset < strike for a put. TimeSteps is the frequency at which the asset price is checked as to whether the strike is breached (e.g., for 252 trading days, set DT as 1/252).

703. B2TradingDayAdjustedCall
Call option corrected for varying volatilities (higher on trading days than on nontrading days). Trading Days Ratio is the number of trading days left until maturity divided by total trading days per year (between 250 and 252).

704. B2TradingDayAdjustedPut
Put option corrected for varying volatilities (higher on trading days than on nontrading days). Trading Days Ratio is the number of trading days left until maturity divided by total trading days per year (between 250 and 252).

705. B2TrinomialImpliedArrowDebreuLattice
Computes the complete set of implied Arrow-Debreu prices in an implied trinomial lattice using actual observed data. Copy and paste the function and use Ctrl+Shift+Enter to obtain the matrix.

706. B2TrinomialImpliedArrowDebreuValue
Computes the single value of implied Arrow-Debreu price (for a specific step/column and up-down event/row) in an implied trinomial lattice using actual observed data.

707. B2TrinomialImpliedCallOptionValue
Computes the European call option using an implied trinomial lattice approach, taking into account actual observed inputs.

708. B2TrinomialImpliedDownProbabilityLattice
Computes the complete set of implied DOWN probabilities in an implied trinomial lattice using actual observed data. Copy and paste the function and use Ctrl+Shift+Enter to obtain the matrix.

709. B2TrinomialImpliedDownProbabilityValue
Computes the single value of implied DOWN probability (for a specific step/column and up-down event/row) in an implied trinomial lattice using actual observed data.

710. B2TrinomialImpliedLocalVolatilityLattice
Computes the complete set of implied local probabilities in an implied trinomial lattice using actual observed data. Copy and paste the function and use Ctrl+Shift+Enter to obtain the matrix.

711. B2TrinomialImpliedLocalVolatilityValue
Computes the single value of implied localized volatility (for a specific step/column and up-down event/row) in an implied trinomial lattice using actual observed data.

712. B2TrinomialImpliedUpProbabilityLattice
Computes the complete set of implied UP probabilities in an implied trinomial lattice using actual observed data. Copy and paste the function and use Ctrl+Shift+Enter to obtain the matrix.

713. B2TrinomialImpliedUpProbabilityValue
Computes the single value of implied UP probability (for a specific step/column and up-down event/row) in an implied trinomial lattice using actual observed data.

714. B2TrinomialImpliedPutOptionValue
Computes the European put option using an implied trinomial lattice approach, taking into account actual observed inputs.

715. B2TwoAssetBarrierDownandInCall
Valuable or knocked in the money only if the lower barrier is breached (reference Asset 2 goes below the barrier), and the payout is in the option on Asset 1 less the strike price.

716. B2TwoAssetBarrierDownandInPut
Valuable or knocked in the money only if the lower barrier is breached (reference Asset 2 goes below the barrier), and the payout is in the option on the strike price less the Asset 1 value.

717. B2TwoAssetBarrierDownandOutCall
Valuable or stays in-the-money only if the lower barrier is not breached (reference Asset 2 does not go below the barrier), and the payout is in the option on Asset 1 less the strike price.

718. B2TwoAssetBarrierDownandOutPut
Valuable or stays in the money only if the lower barrier is not breached (reference Asset 2 does not go below the barrier), and the payout is in the option on the strike price less the Asset 1 value.

719. B2TwoAssetBarrierUpandInCall
Valuable or knocked in the money only if the upper barrier is breached (reference Asset 2 goes above the barrier), and the payout is in the option on Asset 1 less the strike price.

720. B2TwoAssetBarrierUpandInPut
Valuable or knocked in the money only if the upper barrier is breached (reference Asset 2 goes above the barrier), and the payout is in the option on the strike price less the Asset 1 value.

721. B2TwoAssetBarrierUpandOutCall
Valuable or stays in the money only if the upper barrier is not breached (reference Asset 2 does not go above the barrier), and the payout is in the option on Asset 1 less the strike price.

722. B2TwoAssetBarrierUpandOutPut
Valuable or stays in the money only if the upper barrier is not breached (reference Asset 2 does not go above the barrier), and the payout is in the option on the strike price less the Asset 1 value.

723. B2TwoAssetCashOrNothingCall
Pays cash at expiration as long as both assets are in the money. For call options, both asset values must be above their respective strike prices.

724. B2TwoAssetCashOrNothingDownUp
Cash will be paid only if at expiration the first asset is below the first strike, and the second asset is above the second strike.

725. B2TwoAssetCashOrNothingPut
Pays cash at expiration as long as both assets are in the money. For put options, both assets must be below their respective strike prices.

726. B2TwoAssetCashOrNothingUpDown
Cash will be paid only if the first asset is above the first strike price, and the second asset is below the second strike price at maturity.

727. B2TwoAssetCorrelationCall
Asset 1 is the benchmark asset, whereby if at expiration Asset 1's value exceeds Strike 1's value, then the call option is knocked in the money, and the payoff on the option is Asset 2 – Strike 2; otherwise the option becomes worthless.

728. B2TwoAssetCorrelationPut
Asset 1 is the benchmark asset, whereby if at expiration Asset 1's value is below Strike 1's value, then the put option is knocked in the money, and the payoff on the option is Strike 2 – Asset 2; otherwise the option becomes worthless.

729. B2VaRCorrelationMethod
Computes the Value at Risk using the Variance-Covariance and Correlation method, accounting for a specific VaR percentile and holding period.

730. RB2VaROptions
Computes the Value at Risk of a portfolio of correlated options.

731. B2Volatility
Returns the Annualized Volatility of time-series cash flows. Enter in the number of periods in a cycle to annualize the volatility (1 = annual, 4 = quarterly, 12 = monthly data).

732. B2VolatilityImpliedforDefaultRisk
Used only when computing the implied volatility required for optimizing an option model to compute the probability of default.

733. B2WarrantsDilutedValue
Returns the value of a warrant (like an option) that is convertible to stock while accounting for dilution effects based on the number of shares and warrants outstanding.

734. B2WriterExtendibleCallOption
The call option is extended beyond the initial maturity to an extended date with a new extended strike if at maturity the option is out of the money, providing a safety net of time for the option holder.

735. B2WriterExtendiblePutOption
The put option is extended beyond the initial maturity to an extended date with a new extended strike if at maturity the option is out of the money, providing a safety net of time for the option holder.

736. B2YieldCurveBIM
Returns the Yield Curve at various points in time using the Bliss model.

737. B2YieldCurveNS
Returns the Yield Curve at various points in time using the Nelson-Siegel approach.

738. B2ZEOB
Returns the Economic Order Batch or the optimal quantity to be manufactured on each production batch.

739. B2ZEOBBatch
Returns the Economic Order Batch analysis' optimal number of batches to be manufactured per year.

740. B2ZEOBHoldingCost
Returns the Economic Order Batch analysis' cost of holding excess units per year if manufactured at the optimal level.

741. B2ZEOBProductionCost
Returns the Economic Order Batch analysis' total cost of setting up production per year if manufactured at the optimal level.

742. B2ZEOBTotalCost
Returns the Economic Order Batch analysis' total cost of production and holding costs per year if manufactured at the optimal level.

743. B2ZEOQ
Economic Order Quantity's order size on each order.

744. B2ZEOQExcess
Economic Order Quantity's excess safety stock level.

745. B2ZEOQOrders
Economic Order Quantity's number of orders per year.

746. B2ZEOQProbability
Economic Order Quantity's probability of out of stock.

747. B2ZEOQReorderPoint
Economic Order Quantity's reorder point.

The following lists the statistical and analytical tools in the Modeling Toolkit:

748. Statistical Tool: Chi-Square Goodness of Fit Test

749. Statistical Tool: Chi-Square Independence Test

750. Statistical Tool: Chi-Square Population Variance Test

751. Statistical Tool: Dependent Means (T)

752. Statistical Tool: Friedman's Test

753. Statistical Tool: Independent and Equal Variances (T)

754. Statistical Tool: Independent and Unequal Variances (T)

755. Statistical Tool: Independent Means (Z)

756. Statistical Tool: Independent Proportions (Z)

757. Statistical Tool: Independent Variances (F)

758. Statistical Tool: Kruskal-Wallis Test

759. Statistical Tool: Lilliefors Test

760. **Statistical Tool: Principal Component Analysis**
761. **Statistical Tool: Randomized Block Multiple Treatments**
762. **Statistical Tool: Runs Test**
763. **Statistical Tool: Single Factor Multiple Treatments**
764. **Statistical Tool: Testing Means (T)**
765. **Statistical Tool: Testing Means (Z)**
766. **Statistical Tool: Testing Proportions (Z)**
767. **Statistical Tool: Two-Way ANOVA**
768. **Statistical Tool: Variance-Covariance Matrix**
769. **Statistical Tool: Wilcoxon Signed-Rank Test (One Variable)**
770. **Statistical Tool: Wilcoxon Signed-Rank Test (Two Variables)**
771. **Valuation Tool: Lattice Maker for Debt**
772. **Valuation Tool: Lattice Maker for Yield**

The following lists Risk Simulator tools/applications that are used in the Modeling Toolkit:

773. **Monte Carlo Simulation Using 25 Statistical Distributions**
774. **Monte Carlo Simulation: Simulations with Correlations**
775. **Monte Carlo Simulation: Simulations with Precision Control**
776. **Monte Carlo Simulation: Simulations with Truncation**
777. **Stochastic Forecasting: Box-Jenkins ARIMA**
778. **Stochastic Forecasting: Maximum Likelihood**
779. **Stochastic Forecasting: Nonlinear Extrapolation**
780. **Stochastic Forecasting: Regression Analysis**
781. **Stochastic Forecasting: Stochastic Processes**
782. **Stochastic Forecasting: Time-Series Analysis**
783. **Portfolio Optimization: Discrete Binary Decision Variables**
784. **Portfolio Optimization: Discrete and Continuous Decision Variables**
785. **Portfolio Optimization: Discrete Decision Variables**
786. **Portfolio Optimization: Static Optimization**

787. **Portfolio Optimization: Dynamic Optimization**

788. **Portfolio Optimization: Stochastic Optimization**

789. **Simulation Tools: Bootstrap Simulation**

790. **Simulation Tools: Custom Historical Simulation**

791. **Simulation Tools: Data Diagnostics**

792. **Simulation Tools: Distributional Analysis**

793. **Simulation Tools: Multiple Correlated Data Fitting**

794. **Simulation Tools: Scenario Analysis**

795. **Simulation Tools: Sensitivity Analysis**

796. **Simulation Tools: Single Data Fitting**

797. **Simulation Tools: Statistical Analysis**

798. **Simulation Tools: Tornado Analysis**

The following lists Real Options SLS tools/applications that are used in the Modeling Toolkit:

799. **Audit Sheet Functions**

800. **Changing Volatility and Risk-Free Rates Model**

801. **Lattice Maker**

802. **SLS Single Asset and Single Phase: American Options**

803. **SLS Single Asset and Single Phase: Bermudan Options**

804. **SLS Single Asset and Single Phase: Customized Options**

805. **SLS Single Asset and Single Phase: European Options**

806. **SLS Multiple Asset and Multiple Phases**

807. **SLS Multinomial Lattices: Pentanomials**

808. **SLS Multinomial Lattices: Quadranomials**

809. **SLS Multinomial Lattices: Trinomials**

810. **SLS Multinomial Lattices: Trinomials Mean-Reversion**

Glossary of Input Variables and Parameters in the Modeling Toolkit Software

Each of the inputs used in the Modeling Toolkit functions are listed here. Typically, most inputs are single point estimates, that is, a single value such as 10.50, with the exception of the input variables listed with “Series” in parenthesis.

A

This is the first input variable that determines the shape of the beta and gamma functions, and is required to compute the Incomplete Beta and Incomplete Gamma values. The Incomplete Beta function is a generalization of the beta function that replaces the definite integral of the beta function with an indefinite integral, and is a mathematical expression used to compute a variety of probability distributions such as the gamma and beta distributions. The same can be said about the Incomplete Beta function. This input is used exclusively in the B2MathIncompleteBeta, B2MathIncompleteGammaP, and B2MathIncompleteGammaQ functions, and the parameter is a positive value.

Above Below

This input variable is used in the partial floating lookback options where the strike price is floating at the Above Below ratio, which has to be a positive value, and is greater than or equal to 1 for a call, and less than or equal to 1 for a put.

Accruals

This is the amount in notes accruals, a subsection of current liabilities in the balance sheet. This variable is typically zero or a positive dollar or currency amount.

Additional Cost

This is the amount in additional operating cost used in the B2CreditAcceptanceCost function to determine if a specific credit should be accepted or rejected. This variable is typically a positive dollar or currency amount, and the amount can be zero or positive.

Alpha

Alpha is used in several places and has various definitions. In the first instance, alpha is the shape parameter in several distributions such as the beta, gamma, Gumbel, logistic, and Weibull distributions. It is also used in the Forward Call Option where if Alpha < 1, then a call option starts (1 – Alpha)% in the money (a put option will be the same amount out of the money), or if Alpha > 1, then the call starts (Alpha – 1)% out of the money (a put option will be the same amount in the money). Finally, alpha is also used as the alpha error level, or Type I error, also known as the significance level in a hypothesis test. It measures the probability of not having the true population mean included in the confidence interval of the sample. That is, it computes the probability of rejecting a true hypothesis. 1 – Alpha is of course the confidence interval, or the probability that the true population mean resides in the sample confidence interval, and is used in several Six Sigma models. Regardless of use, this parameter has to be a positive value.

Amortization

This is the amount in amortization in the financial income statement of a firm, and is used to compute the cash flow to equity for both a levered and unlevered firm. This amount is typically zero or positive.

Amounts (Series)

This is a series of numbers (typically listed in a single column with multiple rows) indicating the dollar or currency amounts invested in a specific asset class, used to compute the total portfolio's Value at Risk and used only in the B2VaRCorrelationMethod function. These parameters have to be positive values and arranged in a column with multiple rows.

Arithmetic Mean

This is the simple average used in the lognormal distribution. We differentiate this from the geometric or harmonic means, as this arithmetic mean or simple average is the one used as an input parameter in the lognormal distribution. This parameter has to be a positive value, as the lognormal distribution takes on only positive values.

Arithmetic Standard Deviation

This is a simple population standard deviation that is used in the lognormal distribution. You can use Excel's STDEVP to compute this value from a series of data points. This parameter has to be a positive value.

Arrival Rate

This is the rate of arrival on average to a queue in a specific time period (e.g., the average number of people arriving at a restaurant per day or per hour), and typically follows a Poisson distribution. This parameter has to be a positive value.

Asset 1 and Asset 2

These are the first and second assets in a two-asset exotic option or exchange of asset options. Typically, the first asset (Asset 1) is the payoff asset, whereas the second asset (Asset 2) is some sort of benchmark asset. This is not to be confused with PVAsset, which is the present value of the asset used in a real options analysis. These parameters must be positive values.

Asset Allocation (Series)

These are a series of percentage allocations of assets in a portfolio and must sum to 100%, and this series is used to compute a portfolio's total risk and return levels. These parameters are arranged in a single column with multiple rows and can take on zero or positive values, but the sum of these values must equal 100%.

Asset Turnover

This is the total asset turnover financial ratio, or equivalent to annual total sales divided by total assets, used to compute return on equity or return on assets ratios. It has to be a positive value.

Asset Volatility

This is the internal asset volatility (not to be confused with regular volatility in an options model where we compute it using external equity values) used in determining probabilities of default and distance to default on risky debt (e.g., Merton models); it has to be a positive value. This value can only be determined through optimization either using Risk Simulator to solve for a multiple simultaneous equation function or using the B2MertonImputedAssetVolatility function.

Average Lead

This is the average lead time in days required in order to receive an order that is placed. This parameter is typically a positive value, and is used in the economic order quantity models.

Average Measurement (Series)

This is a series of the average measurements per sample subgroup in a Six Sigma environment to determine the upper and lower control limits for a control chart (e.g., in an experiment, 5 measurements are taken of a production output, and the experiment is repeated 10 different times with 5 samples taken each time, and the 10 averages of the 5 samples are computed). These values are typically zero or positive, and are arranged in a single column with multiple rows.

Average Price

This is the average of historically observed stock prices during a specific lookback period, used to determine the value of Asian options. This parameter has to be positive.

B

This is the second input variable for the scale of the beta or gamma functions, and is required to compute the Incomplete Beta and Incomplete Gamma values. The Incomplete Beta function is a generalization of the Beta function that replaces the definite integral of the beta function with an indefinite integral, and is a mathematical expression used to compute a variety of probability distributions such as the gamma and beta distributions. The same can be said about the Incomplete Beta function. This input is used exclusively in B2MathIncompleteBeta, B2MathIncompleteGammaP, and B2MathIncompleteGammaQ functions, and the parameter is a positive value.

Barrier

This is the stock price barrier (it can be an upper or lower barrier) for certain exotic barrier and binary options where if the barrier is breached within the lifetime of the option, the option either comes into the money or goes out of the money, or an asset or cash is exchanged. This parameter is a positive value.

Base

This is the power value for determining and calibrating the width of the credit tables. Typically, it ranges between 1 and 4 and has to be a positive value.

Baseline DPU

This is the average number of defects per unit in a Six Sigma process, and is used to determine the number of trials required to obtain a specific error boundary and significance level based on this average DPU. This parameter has to be a positive value.

Batch Cost

This is the total dollar or currency value of the cost to manufacture a batch of products each time the production line is run. This parameter is a positive value.

Benchmark Prices (Series)

This is a series of benchmark prices or levels arranged in a single column with multiple rows, such as the market Standard & Poor's 500, to be used as a benchmark against another equity price level in order to determine the Sharpe ratio.

Best Case

This is the best-case scenario value or dollar/currency, used in concert with the Expected Value and Percentile value, to determine the volatility of the process or project. This value is typically positive and has to exceed the expected value.

Beta

This parameter is used in several places and denotes different things. When used in the beta, gamma, Gumbel, logistic, and Weibull distributions, it is used to denote the scale of the distribution. When used in the capital asset pricing model (CAPM), it is used to denote the beta relative risk (covariance between a stock's returns and market returns divided by the variance of the market returns). Finally, beta is also used as the beta error or Type II error, measuring the probability of accepting a false hypothesis, or the probability of not being able to detect the standard deviation's changes. 1 – Beta is the power of the test, and this parameter is used in statistical sampling and sample size determination in the Six Sigma models. Regardless, this parameter has to be a positive value.

Beta 0, 1, and 2

These are mathematical parameters in a yield curve construction when applying the Bliss and Nelson-Siegel models for forecasting interest rates. The exact values of these parameters need to be calibrated with optimization, but are either zero or positive values.

Beta Levered

This is the relative risk beta level of a company that is levered or has debt, and can be used to determine the equivalent level of an unlevered company's beta. This parameter has to be a positive value.

Beta Unlevered

This is the relative risk beta level of a company that is unlevered or has zero debt, and can be used to determine the equivalent level of a levered company's beta with debt. This parameter has to be a positive value.

Bond Maturity

This is the maturity of a bond, measured in years, and has to be a positive value.

Bond Price

This is the market price of the bond in dollars or other currency units, and has to be a positive value.

Bond Yield

This is the bond's yield to maturity—that is, the internal rate of return on the bond when held to maturity—and has to be a positive value. These could be applied to corporate bonds or Treasury zero coupon bonds.

Buy Cap Rate

This is the capitalization rate computed by (net operating income/sale price) at the time of purchase of a property, and is typically a positive value, used in the valuation of real estate properties.

BV Asset

This is the book value of assets in a company, including all short-term and long-term assets.

BV Debt and BV Liabilities

This is the book value of debt or all liabilities in a company, including all short-term and long-term debt or liabilities, and has to be a positive value.

BV Per Share

This is the book value price of a share of stock, typically recorded at the initial public offering price available through the company's balance sheet, and has to be a positive value.

Calendar Ratio

This ratio is a positive value and is used in pricing an option with a Trading Day Correction, which looks at a typical option and corrects it for the varying volatilities. Specifically, volatility tends to be higher on trading days than on nontrading days. The Trading Days Ratio is simply the number of trading days left until maturity divided by the total number of trading days per year (typically between 250 and 252), and the Calendar Days Ratio is the number of calendar days left until maturity divided by the total number of days per year (365).

Callable Price

This is the amount that, when a bond is called, the bondholder will be paid, and is typically higher than the par value of the bond. This parameter requires a positive value.

Callable Step

This is the step number on a binomial lattice representing the time period when a bond can be called, and this parameter is a positive integer. For instance, in a 10-year bond when the bond is callable starting on the fifth anniversary, the callable step is 50 in a 100-step lattice model.

Call Maturity

This is the maturity of the call option in years, and is used in the complex chooser option (i.e., the exotic option where the holder can decide to make it a call or a put, and each option has its own maturity and strike values), and must be a positive value.

Call Strike

This is the strike price of the call option in dollars or currency, and is used in the complex chooser option (i.e., the exotic option where the holder can decide to make it a call or a put, and each option has its own maturity and strike values), and must be a positive value. Sometimes, this variable has different suffixes (e.g., Call Strike Sell Low, Call Strike Buy High, and so forth, whenever there might be more than one call option in the portfolio of option strategies, and these suffixes represent whether this particular call is bought or sold, and whether the strike price is higher or lower than the other call option).

Call Value

This is the value of a call option, and is used in the put-call parity model, whereby the value of a corresponding put can be determined given the price of the call with similar option parameters, and this parameter has to be a positive value. Sometimes, this variable has different suffixes (e.g., Call Value Sell Low, Call Value Buy High, and so forth, whenever there might be more than one call option in the portfolio of option

strategies, and these suffixes represent whether this particular call is bought or sold, and whether the premium paid for the option or the option's value is higher or lower than the other call option).

Cap

This is the interest rate cap (ceiling) in an interest cap derivative, and has to be a positive value. The valuation of the cap is done through computing the value of each of its caplets and summing them up for the price of the derivative.

Capacity

This is the maximum capacity level, and is used in forecasting using the S-curve model (where the capacity is the maximum demand or load the market or environment can hold), as well as in the economic order quantity (batch production) model; it has to be a positive value.

Capital Charge

This is the amount of invested capital multiplied by the weighted average cost of capital or hurdle rate or required rate of return. This value is used to compute the economic profit of a project, and is a positive value.

Capital Expenditures

This is used to compute the cash flow to the firm and the cash flow to equity for a firm. Capital expenditures are deducted from the net cash flow to a firm as an expenditure, and this input parameter can be zero or a positive value.

Cash

This variable is used in several places. The first and most prominent is the amount of money that is paid when a binary or barrier option comes into the money, whereas it is also used to denote the amount of cash available in a current asset on a balance sheet. This parameter is zero or positive.

Cash Dividend

This is the dividend rate or dividend yield, in percent, and is typically either zero or positive. This parameter is not to be confused with Cash Dividends series, which is a dollar or currency unit amount, and which can also be zero or positive. This variable is used many times in exotic and real options models.

Cash Dividends (Series)

This is a series of cash dividends in dollars or currency units, which come as lump sum payments of dividends on the underlying stock of an option and can be zero or positive values. This input variable is used in the Generalized Black-Scholes model with cash dividends, and the timing of these cash dividends (Dividend Times) are also listed as a series in a single column with multiple rows.

Cash Flows (Series)

This is a series of cash flows used for a variety of models, including the computation of volatility (using the logarithmic cash flow returns approach) and bond models (bond pricing, convexity, and duration computations), and each cash flow value must be a positive number, arranged in a column with multiple rows.

Channels

This is the number of channels available in a queuing model—for instance, the number of customer service or point of sale cash registers available in a McDonald's fast-food restaurant, where patrons can obtain service. This parameter is a positive integer.

Channels Busy

This is the number of channels that are currently busy and serving customers at any given moment. This parameter can be zero or a positive integer.

Choose Time or Chooser Time

This is the time available for the holder of a complex chooser option whereby the option holder can choose to make the option a call or a put, with different maturities and strike prices. This parameter is a positive value.

Column

The column number in a lattice; for instance, if there is a 20-step lattice for 10 years, then the column number for the third year is the sixth step in the lattice and the column is set to 6, corresponding to the step in the lattice.

Columnwise

This variable is used in the changing risk-free and changing volatility option model, where the default is 1, indicating that the data (risk-free rates and volatilities) are arranged in a column. This parameter is either a 1 (values are listed in a column) or a 0 (values are listed in a row).

Common Equity

This is the total common equity listed in the balance sheet of a company, and is used in financial ratios analysis to determine the return on equity as well as other profitability and efficiency measures, and this parameter is a positive value. This value is different than Total Equity, which also includes other forms such as preferred equity.

Compounding

This is the number of compounding periods per year for the European Swaptions (payer and receiver) and requires a positive integer (e.g., set it as 365 for daily compounding, 12 for monthly compounding, and so forth).

Contract Factor

This is the contraction factor used in a real option to contract, and this value is computed as the after-contracting net present value divided by the existing base-case net present value (stated another way, this value is $1 - X$ where X is the fraction that is forgone if contraction occurs, or the portion that is shared with an alliance or joint venture partner or outsourcing outfit), and the parameter has to be between 0 and 1, noninclusive.

Conversion Date

This is the number of days in the future where the convertible bond can be converted into an equivalent value of equity.

Corporate Bond Yield

This is the yield of a risky debt or a risky corporate bond in percent, and is used to compute the implied probability of default of a risky debt given a comparable zero coupon risk-free bond with similar maturity. This input has to be a positive value.

Correlation

This variable is used in multiple places, including exotic options with multiple underlying assets (e.g., exchange of assets, two-asset options, foreign exchange, and futures or commodity options) and the bivariate normal distribution where we combine two correlated normal distributions.

Correlations (Series)

This is an $n \times n$ correlation matrix and is used to value the portfolio Value at Risk where the individual components of the portfolio are correlated with one another.

Cost, Cost 1, and Cost 2

This is a dollar or currency amount corresponding to the cost to execute a particular project or option, and has to be a positive value. This variable is used most frequently in real options models. When there are multiple costs (Cost 1 and Cost 2), this implies several underlying assets and their respective costs or strike prices.

Cost of Debt

This is the cost of debt before tax in percent, used to compute the weighted average cost of capital for a project or firm, and is typically a zero or positive value.

Cost of Equity

This is the cost of equity before tax in percent, used to compute the weighted average cost of capital for a project or firm, and is typically a zero or positive value.

Cost of Funds

This is the cost of obtaining additional funds, in percent, and used in determining credit acceptance levels, and this parameter can be zero or a positive value.

Cost of Losing a Unit

This is the monetary dollar or currency amount lost or forgone if one unit of sales is lost when there is an insufficient number of channels in the queuing models to determine the optimal number of channels to have available, and can be zero or a positive value.

Cost of Order

This is a dollar or currency amount of the cost of placing an order for additional inventory, used in the economic order quantity models to determine the optimal quantity of inventory to order and to have on hand.

Cost of Preferred Equity

This is the before-tax cost of preferred equity in percent, used to compute the cost of funds using the weighted average cost of capital model, and is either zero or a positive value.

Cost to Add Channel

This is the monetary dollar or currency amount required to add another channel in the queuing models, to determine the optimal number of channels to have available, and is a positive value.

Coupon and Coupons (Series)

This is the coupon payment in dollars or currency of a debt or callable debt, and is used in the options adjusted spread model to determine the required spreads for a risky and callable bond. For Coupons, it is a time series of cash coupon payments at specific times.

Coupon Rate

This is the coupon payment per year, represented in percent, and is used in various debt-based options and credit options where the underlying is a coupon-paying bond or debt, and this value can be zero or positive.

Covariances (Series)

This is the $n \times n$ variance-covariance matrix required to compute the portfolio returns and risk levels given each individual asset's allocation (see Asset Allocation), and these values can be negative, zero, or positive values. The Variance-Covariance Matrix tool in the Modeling Toolkit can be used to compute this matrix given the raw data of each asset's historical values.

Credit Exposures

This is the number of credit or debt lines that exists in a portfolio, and has to be a positive integer.

Credit Spread

This is the percentage spread difference between a risky debt or security and the risk-free rate with comparable maturity, and is typically a positive value.

Cum Amount

This is a dollar or currency amount, used in a Time Switch option, where the holder receives the Accumulated (Cum) Amount $\times$ Time Steps each time the asset price exceeds the strike price for a call option (or falls below the strike price for a put option).

Currency Units

This input parameter is a positive value and is used in a Foreign Takeover option with a foreign exchange element, which means that if a successful takeover ensues (if the value of the foreign firm denominated in foreign currency is less than the foreign currency units required), then the option holder has the right to purchase the number of foreign currency units at the predetermined strike price (denominated in exchange rates of the domestic currency to the foreign currency) at the expiration date of the option.

Current Asset

This is the sum of cash, accounts receivable, and inventories on a balance sheet, that is, the short-term liquid assets, and has to be a positive value.

Current Price

This is the price level of a variable at the current time. This known value has to be positive, and is used for forecasting future price levels.

Current Yield

This is the current spot interest rate or yield, used to price risky debt with callable and embedded option features, and has to be a positive value.

Custom Risk-free (Series)

This is a series of risk-free rates with the relevant times of occurrence—that is, where there are two columns with multiple rows and the first column is the time in years (positive values) and the second column lists the risk-free rates (each value has to be a positive percentage), and both columns have multiple rows. This variable is used in the custom option models where risk-free rates and volatilities are allowed to change over time.

Custom Volatility (Series)

This is a series of annualized volatilities with the relevant times of occurrence—that is, where there are two columns with multiple rows and the first column is the time in years (positive values) and the second column lists the volatilities (each value has to be a positive percentage), and both columns have multiple rows. This variable is used in the custom option models where risk-free rates and volatilities are allowed to change over time.

CY Reversion

This is the rate of mean reversion of the convenience yield of a futures and commodities contract, and has to be zero or a positive value. The convenience yield is simply the rate differential between a nonarbitrage futures and spot price and a real-life fair market value of the futures price, and can be computed using the B2ConvenienceYield function. With the raw data or computed convenience yields, the mean reversion rate can be calibrated using Risk Simulator's statistical analysis tool.

CY Volatility

This is the annualized volatility of the convenience yield of a futures and commodities contract, and has to be a positive value. The convenience yield is simply the rate differential between a nonarbitrage futures and spot price and a real-life fair market value of the futures price, and can be computed using the B2ConvenienceYield function. The volatility can be computed using various approaches as discussed in the Volatility definition.

Daily Volatilities (Series)

This is a series of daily volatilities of various asset classes (arranged in a column with multiple rows), used in computing the portfolio Value at Risk, where each volatility is typically small but has to be a positive value.

Days Per Year

This is the number of days per year to compute days sales outstanding, and is typically set to 365 or 360. The parameter has to be a positive integer.

Debt Maturity

The maturity period measured in years for the debt, typically this is the maturity of a corporate bond, and is a positive value, used in the asset-equity parity models, to determine the market value of assets and market value of debt, based on the book value of debt and book value of assets as well as the equity volatility.

Defaults

This is the number of credit or debt defaults within some specified period, and can be zero or a positive integer.

Default Probability

This is the probability of default, set between 0% and 100%, to compute the credit risk shortfall value, and can be computed using the Merton probability of default models, as well as other probability of default models in the Modeling Toolkit.

Defective Units (Series)

These is the series of numbers of defective units in Six Sigma models, to compute the upper and lower control limits for quality control charts; the numbers are typically zero or positive integers, arranged in a column with multiple rows.

Defects

This is a single value indicative of the number of defects in a process for Six Sigma quality control, to determine items such as process capability (Cpk) defects per million opportunities (DPMO) and defects per unit (DPU). This parameter is either zero or a positive integer.

Delta

Delta is a precision measure used in Six Sigma models. Specifically, the Delta Precision is the accuracy or precision with which the standard deviation may be estimated. For instance, a 0.10% Delta with 5% Alpha for 2 tails means that the estimated mean is plus or minus 0.10%, at a 90% (1 – 2 × Alpha) confidence level.

Deltas (Series)

This is a series of delta measures, where the delta is defined here as a sensitivity measure of an option. Specifically, it is the instantaneous change of the option value with an instantaneous change in the stock price. You can use the B2CallDelta function to compute this input, which typically consists of positive values arranged in a column with multiple rows.

Demand

This is the level of demand for a particular manufactured product, used to determine the optimal economic order quantity or the optimal level of inventory to have on hand, and has to be a positive integer.

Depreciation

This is the level of depreciation, measured in dollars or currency levels, as a noncash expense add-back to obtain the cash flows available to equity and cash flows available to the firm.

DF

This is the degrees of freedom input used in the chi-square and t-distributions. The higher this value, the more closely these distributions approach the normal Gaussian distribution. This input parameter is a positive integer, and is typically larger than 1. You can use Risk Simulator's distributional fitting tool to fit your existing data to obtain the best estimate of DF. Alternatively, the distributional analysis tool can also be used to see the effects of higher and lower DF values.

DF Denominator

This is the degrees of freedom of the denominator used in the F-distribution. This input parameter is a positive integer, and is typically larger than 1. You can use Risk Simulator's distributional fitting tool to fit your existing data to obtain the best estimate of

DF. Alternatively, the distributional analysis tool can also be used to see the effects of higher and lower DF values.

DF Numerator

This is the degrees of freedom of the numerator used in the F-distribution. This input parameter is a positive integer, and is typically larger than 1. You can use Risk Simulator's distributional fitting tool to fit your existing data to obtain the best estimate of DF. Alternatively, the distributional analysis tool can also be used to see the effects of higher and lower DF values.

Discount Rate

This is the discount rate used to determine the price-to-earnings multiple by first using this input to value the future stock price. This parameter is a positive value, and in the case of the PE Ratio model it needs to be higher than the growth rate. Sometimes the weighted average cost of capital is used in its place for simplicity.

Dividend, Dividend Rate, Dividend 1 and 2

This is the dividend rate or dividend yield, in percent, and is typically either zero or positive. This parameter is not to be confused with Cash Dividend, which is a dollar or currency unit amount and can also be zero or positive. This variable is used many times in exotic and real options models. Dividend 1 and Dividend 2 are simply the dividend yields on the two underlying assets in a two-asset option.

Dividend Times (Series)

This is a series of times in years when the cash dividends in dollars or currency are paid on the underlying stock of an option, and can be zero or positive values. This input variable is used in the Generalized Black-Scholes model with cash dividends, and the timing of these cash dividends is listed as a series in a single column with multiple rows.

Domestic RF

This is the domestic risk-free rate used in foreign or takeover options that requires the inputs of a domestic and foreign risk-free rate, which in this case has to be a positive value.

Down

This is the down step size used in an asymmetrical state option pricing model, and needs to be a value between 0 and 1.

DSO

This is days sales outstanding, or the average accounts receivables divided by the average sales per day, to be used to compute the profitability of issuing new credit to a corporation. This input variable can be computed using the B2RatiosDaysSalesOutstanding function, and the parameter has to be a positive value.

DT

This is the time between steps; that is, suppose a bond or an option has a maturity of 10 years and a 100-step lattice is used. DT is 0.1, or 0.1 years will elapse with every lattice step taken. This parameter has to be a positive value, and is used in the B2BDT lattice functions.

Duration

This variable is typically computed using some B2BondDuration function, but as an input it represents the conversion factor used in converting a spread or interest rate differential into a dollar currency amount, and is used in several debt-based options. This input has to be a positive value, and in some cases is set to 1 in order to determine the debt-based option's value in percentage terms.

EBIT

Earnings before interest and taxes (EBIT) is used in several financial ratios analysis models. EBIT is also sometimes called operating income, and can be a negative or positive value.

Ending Plot

This variable is used in the options trading strategies (e.g., straddles, strangles, bull spreads, and so forth), representing the last value to plot for the terminal stock price (the x-axis on an option payoff chart); it has to be higher than the Starting Plot value, and is a positive input.

EPS

Earnings per share (EPS) is net income divided by the number of shares outstanding; EPS is used in several financial ratios analysis models, and can take on either negative or positive values.

Equity Correlation

This is the correlation coefficient between two equity stock prices (not returns), and can be between –1 and +1 (inclusive), including 0.

Equity Multiplier

Equity multiplier is the ratio of total assets to the total equity of the company, indicating the amount of increase in the ability of the existing equity to generate the available total assets, and has to be a positive value.

Equity Price or Share Price

This is the same as stock price per share, and has to be a positive value.

Equity Value or Total Equity

This is the same as total equity in a firm, computed by the number of shares outstanding times the market share price, and can be either zero or a positive value.

Equity Volatility

This is the volatility of stock prices, not to be confused with the volatility of internal assets. The term Volatility is used interchangeably with Equity Volatility, but this term is used in models that require both equity volatility and some other volatility (e.g., asset volatility or foreign exchange rate volatility), and this value is typically positive.

Exchange Rate

This is the foreign exchange rate from one currency to another, and is the spot rate for domestic currency to foreign currency; it has to be a positive value.

Exercise Multiple

This is the suboptimal exercise multiple ratio, computed as the historical average stock price at which an option with similar type and class, held by a similar group of people, was executed, divided by the strike price of the option. This multiple has to be greater than 1. This input variable is used in valuing employee stock options with suboptimal exercise behaviors.

Expand Factor

This is the expansion factor for real options models of options to expand, and has to be a positive value greater than 1.0, computed using the total expanded net present value (base case plus the expanded case) divided by the base case net present value.

Expected Value

This is the expected value or mean value of a project's net present value, used to determine the rough estimate of an annualized implied volatility of a project using the management approach (volatility to probability approach), and is typically a positive value.

Face Value

This is the face value of a bond, in dollars or currency, and has to be a positive value. This face value is the redeemable value at the maturity of the bond (typically, this value is $1,000 or $10,000).

First Period

This input variable is used in a spread option, where the maturity of a spread option is divided into two periods (from time zero to this first period, and from the first period to maturity) and the spread option pays the difference between the maximum values of these two periods. This input parameter has to be greater than zero and less than the maturity of the spread option.

First Variable

This is the first variable used in a pentanomial lattice model to value exotic or real options problems. In the pentanomial lattice, two binomial lattices (a binomial lattice models two outcomes, up or down, evolved through the entire lattice) are combined to create a single rainbow lattice with two underlying variables multiplied together, to create five possible outcomes (UP1 and UP2, UP1 and DOWN2, Unchanged 1 and Unchanged 2, DOWN1 and UP2, and DOWN2 and DOWN2). This input parameter has to be a positive value.

Fixed FX Rate

This input variable is used in valuing Quanto options that are traded on exchanges around the world, (also known as foreign equity options). The options are denominated in another currency than that of the underlying asset. The option has an expanding or contracting coverage of the foreign exchange value of the underlying asset, based on the fixed exchange rate (domestic currency to foreign currency), and has to be a positive value.

Floor

This is the interest rate floor and is an interest derivative; it has to be a positive value. The valuation of the floor is done through computing the value of each of its floorlets and summing them up for the price of the derivative.

Foreign Exchange Volatility or Forex Volatility

This is the annualized volatility of foreign exchange rates, typically computed using the annualized logarithmic relative returns (use the B2Volatility function to compute this volatility based on historical exchange rates), and has to be a positive value.

Foreign Rate or Foreign RF

This is the foreign risk-free rate, used in foreign exchange or foreign equity options and valuation models, and has to be a positive value.

Foreign Value

This is the value of a foreign firm denominated in foreign currency, used in valuing a takeover option, and this value has to be a positive number.

Forward CY Correlation

This variable is sometimes truncated to "ForCYCorrel." It is the linear correlation between forward rates and convenience yields, and is used in valuing commodity options. Correlations have to be between –1 and +1 (typically noninclusive).

Forward Days

This is the positive integer representing the number of days into the future where there is a corresponding forward rate that is applicable.

Forward Price

This is the prearranged price of a contract set today for delivery in the future, and is sometimes also used interchangeably in terms of the future price of an asset or commodity that may not be prearranged but is known with certainty or is the expected price in the future.

Forward Rate

This is the forward rate in a commodity option, and has to be a positive value.

Forward Reversion Rate or For-Reversion

This input variable is used in valuing commodity options. It computes the values of commodity-based European call and put options, where the convenience yield and forward rates are assumed to be mean-reverting and each has its own volatilities and cross-correlations, creating a complex multifactor model with interrelationships among the variables. The forward reversion rate is the rate of mean reversion of the forward rate, and is typically a small positive value; it can be determined and calibrated using Risk Simulator's statistical analysis tool.

Forward Time

This is the time in the future when a Forward Start option begins to become active, and this input parameter has to be a positive value greater than zero and less than the maturity of the option.

Forward Volatility or For-Volatility

This input variable is used in valuing commodity options. It computes the values of commodity-based European call and put options, where the convenience yield and forward rates are assumed to be mean-reverting and each has its own volatilities and cross-correlations, creating a complex multifactor model with interrelationships among the variables. The forward volatility is the annualized volatility of forward rates and prices,

and has to be a positive value, typically computed using the annualized logarithmic relative returns of historical forward prices (use the B2Volatility function to compute this volatility based on historical prices). It has to be a positive value.

Free Cash Flow

This is the free cash flow available to the firm, and can be computed as the net income generated by the firm with all the modifications of noncash expense add-backs as well as capital expenditure reductions, or can be computed using the three B2RatiosCashFlow models.

Future Price

This is the price of in the future of any variable that is either known in advance or forecasted. This value is not the price of a futures contract, and is typically a positive value.

Future Returns

This is the returns of any variable that is either known in advance or forecasted. This value is not the returns on a futures contract, and can be positive or negative in value.

Futures, Futures Price, and Futures 1 or Futures 2

This is the price of the futures contract (if there are two futures contracts, there will be a numerical value, as in the futures spread options computations), and has to be a positive value.

Futures Maturity

This is the maturity of the futures contract, measured in years, and has to be a positive value.

Granularities

This input parameter has to be a positive integer value and is used in the computation of finite differences in obtaining the value of an option. Great care has to be taken to calibrate this input, using alternate closed-form solutions.

Gross Rent

This is the dollar or currency amount of annualized gross rent, and can be zero or a positive value; it is used in property valuation models.

Growth Rate

This positive percentage value is used in various locations and signifies the annualized average growth of some variable. In the financial ratios analysis, this would be the growth rate of dividends (and this value must be less than the discount rate used in the model). In contrast, this parameter is the annualized growth rate of assets for the Merton probability of default models, and this variable is used as the growth of a population or market in the S-curve forecast computation on curve saturation rates.

Holding Cost

This is the zero or positive dollar or currency cost of holding on to an additional unit of inventory, used in the economic order quantity models to determine the optimal level of inventories to hold.

Horizon

This is a positive value representing some time period denominated in years, and is used in forecasting future values of some variable.

Horizon Days

This is a positive integer value representing the number of holding days to compute a Value at Risk for, which typically is between 1 and 10 days, and calibrated to how long it will take on average for the bank or company to liquidate its assets to cover any extreme and catastrophic losses or to move out of a loss portfolio.

Inflation

This is the annualized rate of inflation, measured as a percentage, and is typically a positive value, although zero and negative values may occur but are rare.

Interest Lattice

This refers to the lattice that is developed for the underlying interest rates modeled for a yield curve and its spot volatilities over time, and is used in pricing interest-sensitive derivatives.

Interest Paid

This is the dollar or currency amount of interest paid per year, and is either zero or a positive value.

Interest Rate

This is the percentage interest paid per year, and is typically zero or a positive value.

Interest Rates (Series)

This is a series of annualized interest rates or discount rates in percent, in a column with multiple rows, used in computing a project's net present value or the price of a bond (given a corresponding series of cash flows).

Interest Volatility

This is the annualized volatility of interest rates, in percent, and has to be a positive value. See the definition of Volatility in this Glossary for details on some of the techniques used in computing volatility.

Inventory

This is the amount of inventories in dollars or currency, and can be determined from a company's balance sheet; it is typically a positive number but can sometimes take on a zero value.

Invested Capital

This is the dollar or currency amount of invested capital, and is typically a positive value, used to compute capital charge and economic capital of a project or firm.

Investment

This is the initial lump sum investment dollar or currency amount, used to compute the internal rate of return (IRR) of a project, and this value is a positive number (although it is used as a negative value in the model, enter the value as positive).

Jump Rate

This variable is used in a Jump Diffusion option, which is similar to a regular option with the exception that instead of assuming that the underlying asset follows a lognormal Brownian Motion process, the process here follows a Poisson Jump Diffusion process, and is used in the B2ROJumpDiffusion models. That is, stock or asset prices follow jumps, and these jumps occur several times per year (observed from history). Cumulatively, these jumps explain a certain percentage of the total volatility of the asset. The jump rate can be determined using historical data or using Risk Simulator's statistical analysis tool to calibrate the jump rate.

Jump Size

Similar to the Jump Rate, the Jump Size is used to determine the size of a jump in a Jump Diffusion option model. Typically, this value is greater than 1, to indicate how much the jump is from the previous period, and is used on the B2ROJumpDiffusion models.

Jumps Per Year

An alternative input to the Jump Size is the number of jumps per year, as it is easier to calibrate the total number of jumps per year based on expectations or historical data; this input is a positive integer used in the B2MertonJumpDiffusion models.

Known X and Known Y Values

These are the historical or comparable data available and observable, in order to use the cubic spline model (both interpolate missing values and extrapolate and forecast beyond the sample data set), which is usually applied in yield curve and interest rate term structure construction.

Kurtosis

This is the fourth moment of a distribution, measuring the distribution's peakedness and extreme values. An excess kurtosis of 0 is a normal distribution with "normal" peaks and extreme values, and this parameter can take on positive, zero, or negative values.

Lambda, Lambda 1, and Lambda 2

Lambda is the mean or average value used in a Poisson (an event occurring on average during a specified time period or area) and an exponential (the average rate of occurrence) distribution, and is also used in calibrating the yield curve models. Regardless of the use, lambda has to be a positive value.

Last Return

This input is used in the exponentially weighted moving average (EWMA) volatility forecast, representing the last period's return; it can be periodic or annualized, and can take on positive or negative values. If entering a periodic return, make sure to set the Periodicity input in the EWMA function to 1 to obtain a periodic volatility forecast, or the correct periodicity value to obtain the annualized volatility forecast. Conversely, if entering an annualized return, set periodicity to be equal to 1 to obtain the annualized volatility forecast.

Last Volatility

This input is used in the EWMA volatility forecast, representing the last period's volatility; it can be periodic or annualized, and can take on only positive values. If entering a periodic volatility, make sure to set the Periodicity input in the EWMA function to 1 to obtain a periodic volatility forecast, or the correct periodicity value to obtain the

annualized volatility forecast. Conversely, if entering an annualized volatility, set periodicity to be equal to 1 to obtain the annualized volatility forecast.

Likely

This is the most likely or mode value in a triangular distribution, and can take on any value, but has to be greater than or equal to the minimum and less than or equal to the maximum value inputs in the distribution.

Loan Value Ratio

This is a positive percentage ratio of the amount of loan required to purchase a real estate investment to the value of the real estate.

Location

This is the location parameter in the Pareto distribution, also used as the starting point or minimum of the distribution, and is sometimes also called the Beta parameter in the Pareto distribution; it can only take on a positive value.

Long Term Level

This is the long-term level to which the underlying variable will revert in the long run; it is used in mean-reverting option models, where the underlying variable is stochastically changing but reverts to some long-term mean rate, which has to be a positive value.

Long Term Rate

This is similar to the long-term level, but the parameter here is a percent interest rate, a long-term rate to which the underlying interest rate process reverts over time.

Lookback Length

This input variable is used in a floating strike partial lookback option, where at expiration the payoff on the call option is being able to purchase the underlying asset at the minimum observed price from inception to the end of the lookback time. Conversely, the put will allow the option holder to sell at the maximum observed asset price from inception to the end of the lookback time.

Lookback Start

This input variable is used in fixed strike lookback options, where the strike price is predetermined, such that at expiration, the payoff on the call option is the difference between the maximum observed asset price less the strike price during the time between the Lookback Start period to the maturity of the option. Conversely, the put will pay the maximum difference between the lowest observed asset price less the strike price during the time between the starting period of the lookback to the maturity of the option.

Lost Sales Cost

This is the dollar or currency amount of a lost sale, typically zero or a positive value, and is used in the economic order quantity models to determine the optimal levels of inventory to hold or levels of production to have.

Lower Barrier

This is the lower barrier stock price in a double barrier or graduated barrier option, where this barrier is typically lower than the existing stock price and lower than the upper barrier level; it must be a positive value.

Lower Delta

This is the instantaneous options delta (a Greek sensitivity measure that can be computed using the B2CallDelta or B2PutDelta functions) of the percentage change in option value given the instantaneous change in stock prices for the lower barrier stock price level. This value is typically set at zero or a positive value.

Lower Strike

This is the lower strike price (a positive value) in a Supershare option, which is traded or embedded in supershare funds and is related to a Down and Out, Up and Out double barrier option, where the option has value only if the stock or asset price is between the upper and lower barriers; at expiration, it provides a payoff equivalent to the stock or asset price divided by the lower strike price.

Lower Value

This input variable is used in the B2DT lattices for computing option adjusted spreads in debt with convertible or callable options, and represents the value that is one cell adjacent to the right and directly below the current value in a lattice. All values in a lattice and this input must be positive.

LSL

This is the lower specification level of a Six Sigma measured process—that is, the prespecified value that is the lowest obtainable or a value that the process should not be less than.

Marginal Cost

This is the additional dollar or currency cost to the bank or credit-granting institution of approving one extra credit application, and is used to determine if a credit should be approved; this parameter is typically a positive value.

Marginal Profit

This is the additional dollar or currency profit to the bank or credit-granting institution of approving one extra credit application, and is used to determine if a credit should be approved; this parameter is typically a positive value.

Market Price Risk

This input variable is used in mean-reverting option models as well as in the CIR, Merton, and Vasicek models of risky debt, where the underlying interest rate process is also assumed to be mean-reverting. The market price of risk is also synonymous with the Sharpe ratio, or bang for the buck—that is, the expected returns of a risky asset less the risk-free rate, all divided by the standard deviation of the excess returns.

Market Return

This is the positive percentage of the annualized expected rate of return on the market, where a typical index such as the Standard & Poor's 500 is used as a proxy for the market.

Market Volatility

This input variable is the annualized volatility of a market index, used to model the probability of default for both public and private companies using an index, a group of comparables, or the market, assuming that the company's asset and debt book values are known, as well as the asset's annualized volatility. Based on this volatility and the

correlation of the company's assets to the market, we can determine the probability of default.

Matrix A and Matrix B (Series)

This is simply an $n \times m$ matrix where n and m can be any positive integer, and is used for matrix math and matrix manipulations.

Maturity

This is the period until a certain contract, project, or option matures, measured in years, and has to be a positive value.

Maturity Bought

This input variable is the maturity, measured in years (a positive value), of a call option that is bought in a Delta-Gamma hedge that provides a hedge against larger changes in the underlying stock or asset value. This is done by buying some equity shares and a call option, which are funded by borrowing some amount of money and selling a call option at a different strike price. The net amount is a zero sum game, making this hedge costless.

Maturity Extend

This is the maturity in years, for the writer extendible option of the extended maturity, and has to be a positive value.

Maturity Sold

This input variable is the maturity, measured in years, of a call option that is sold in a Delta-Gamma hedge that provides a hedge against larger changes in the underlying stock or asset value. This is done by buying some equity shares and a call option, which are funded by borrowing some amount of money and selling a call option at a different strike price. The net amount is a zero sum game, making this hedge costless.

Maximum or Max

This is the maximum value of a distribution (e.g., in a discrete uniform, triangular, or uniform distribution), indicating the highest attainable value, and can be both positive or negative values, as well as integer (used in discrete uniform, triangular, or uniform distributions) or continuous (used in triangular and uniform distributions).

Mean

This is the arithmetic mean used in distributions (e.g., logistic, lognormal, and normal distributions) as well as the average levels in a Six Sigma process. This value can be positive (e.g., logistic and lognormal distributions) or negative (e.g., normal distribution), and is typically positive when applied in Six Sigma.

Mean Reverting Rate

This is the rate of reversion of an underlying variable (typically interest rates, inflation rates, or some other commodity prices) to a long-run level. This parameter is either zero or positive, and the higher the value, the faster the variable's value reverts to the long-run mean. Use Risk Simulator's statistical analysis tool to determine this rate based on historical data.

Measurement Range (Series)

In each sampling group in a Six Sigma process, several measurements are taken, and the range (maximum value less the minimum value) is determined. This experiment is

replicated multiple times through various sampling groups. The measurement range is hence a series of values (one value for each statistical sampling or experiment subgroup) arranged in a column with multiple rows, where each row represents a group. The range has to be a positive value and is typically a positive integer, and the results are used to determine the central line, as well as upper and lower control limits for quality control charts in Six Sigma.

Minimum or Min

This is the minimum value of a distribution (e.g., in a discrete uniform, triangular, or uniform distribution), indicating the lowest attainable value, and can be both positive or negative values, as well as integer (used in discrete uniform, triangular, or uniform distributions) or continuous (used in triangular and uniform distributions).

MV Debt

This is the market value of risky debt, and can be priced using the Asset-Equity Parity models using book values of debt and equity, and applying the equity volatility in the market. Typically, this value is different from the book value of debt, depending on the market volatility and internal asset values, but is always zero or a positive value.

MV Equity

This is the total market value of equity, computed by multiplying the number of outstanding shares by the market price of a share of the company's stock, and is a positive value.

MV Preferred Equity

This is the total market value of preferred equity, computed by multiplying the number of outstanding shares by the market price of a share of the company's preferred stock, and is a positive value.

Net Fixed Asset

This is the total net fixed assets (gross fixed long-term assets less any accumulated depreciation levels), and is a positive value, obtained from a company's balance sheet.

Net Income

This is the net income after taxes, in dollar or currency amounts, and can be either positive or negative.

New Debt Issue

This is the amount of new debt issued to raise additional capital, and is either zero or positive.

Nominal CF

This is the nominal cash flow amounts, including inflation, and can be negative or positive. Nominal cash flow is the real cash flow levels plus inflation adjustments.

Nominal Rate

This is the quoted or nominal interest rate, which is equivalent to the real rate of interest plus the inflation rate, and as such is typically higher than either the real interest rate or the inflation rate, and must be a positive value.

Nonpayment Probability

This is the probability that a debt holder will be unable to make a payment and will default for one time. Sometimes the probability of default can be used, but in most cases the single nonpayment probability is higher than the complete default probability.

NOPAT

Net operating profits after taxes (NOPAT) is typically computed as net revenues less any operating expenses and less applicable taxes, making this value typically higher than net income, which accounts for other items such as depreciation and interest payments. This parameter can be positive or negative.

Notes or Notes Payable

The amount in dollars or currency for notes payable, a form of short-term current liability, is typically zero or a positive value.

Notional

This is a positive dollar amount indicating the underlying contractual amount (e.g., in a swap).

Observed Max

This is the observed maximum stock price in the past for a lookback Asian option, and this parameter has to be a positive amount and larger than the observed minimum value.

Observed Min

This is the observed minimum stock price in the past for a lookback Asian option, and this parameter has to be a positive amount and smaller than the observed maximum value.

Old Value

This is the previous period's value or old value, used in computing the S-curve forecast, and must be a positive value.

Operating Expenses

The dollar or currency amount of total operating expenses (other than direct expenses or cost of goods sold, but including items like sales and general administrative expenses) has to be a positive value.

Option Maturity

This is the maturity of an option measured in years, and has to be a positive value; the longer the maturity, holding everything else constant, the higher the value of the option.

Option Strike

This is the contractual strike price of an option measured in dollars or currency levels, and has to be a positive value. Holding everything else constant, a higher strike price means a lower call option value and a higher put option value.

Option Value

This is the value of an option, and has to be either zero or a positive value. The option value is never negative, and can be computed through a variety of methods including closed-form models (e.g., Black-Scholes and American approximation models); lattices

(binomial, trinomial, quadranomial, and pentanomial lattices); simulation; and analytical techniques (variance reduction, finite differences, and iterative processes).

Other Assets

The value of any short-term indirect or intangible assets is usually a zero or positive value.

Payables

The amount in dollars or currency values for accounts payable, a form of short-term current liability, is typically zero or a positive value.

Payment Probability

This is used to compute the cost of rejecting a good credit by accounting for the chances that payment will be received each time when it is due, and is a positive percentage value between 0% and 100%.

Percentile

This parameter has to be a positive value between 0% and 100%, and is used in Value at Risk computations and implied volatility computations. In VaR analysis, this value is typically 95%, 99%, or 99.9%, whereas it has to be lower than 50% for the worst-case scenario volatility model and higher than 50% for the best-case scenario volatility model.

Periodicity

Periodicity in the context of barrier options means how often during the life of the option the asset or stock value will be monitored to see if it breaches a barrier. As an example, entering 1 means annual monitoring, 12 implies monthly monitoring, 52 for weekly, 252 for daily trading, 365 for daily calendar, and 1,000,000 for continuous monitoring. In the application of GARCH volatility forecasts, if weekly stock price data is used, enter 52 for periodicity (250 for number of trading days per year if daily data is used, and 12 for monthly data). Regardless of the application, this parameter is a positive integer.

Periodic Rate

This is the interest rate per period, and is used to compute the implied rate of return on an annuity; this value has to be a positive percent.

Periods

This refers to a positive integer value representing the number of payment periods in an annuity, and is used to compute the equivalent annuity payment based on the periodic rate.

Population

This is used in the hypergeometric discrete distribution, indicating the population size. Clearly this positive integer value has to be larger than the population successes and is at least 2. The total number of items or elements or the population size is a fixed number, a finite population; the population size must be less than or equal to 1,750, the sample size (the number of trials) represents a portion of the population, and the known initial probability of success in the population changes after each trial.

Population Success or Pop Success

This is used in the hypergeometric discrete distribution, indicating the number of successes of a trait in a population. Clearly this positive integer value has to be smaller than the population size. The hypergeometric distribution is a distribution where the

actual trials change the probability for each subsequent trial and are called *trials without replacement*. For example, suppose a box of manufactured parts is known to contain some defective parts. You choose a part from the box, find it is defective, and remove the part from the box. If you choose another part from the box, the probability that it is defective is somewhat lower than for the first part because you have removed a defective part. If you had replaced the defective part, the probabilities would have remained the same, and the process would have satisfied the conditions for a binomial distribution. The total number of items or elements (the population size) is a fixed number, a finite population; the population size must be less than or equal to 1,750, the sample size (the number of trials) represents a portion of the population, and the known initial probability of success in the population changes after each trial.

PPE

This is the dollar or currency value of plant, property, and equipment values, and is either zero or positive.

Preferred Dividend

This is the dollar or currency amount of total dividends paid to preferred stocks (dividends per share multiplied by the number of outstanding shares), and is a positive value.

Preferred Stock

This is the price of a preferred stock per share multiplied by the number of preferred shares outstanding, and has to be a positive value.

Previous Value

This is the value of some variable in the previous period, used in forecasting time-series data. This has to be a positive value.

Price and CY Correlation

This is the correlation between bond price returns and convenience yields, used in the computation of commodity options, and can take on any value between –1 and +1, inclusive.

Price and Forward Correlation

This is the correlation between bond price returns and future price returns, used in the computation of commodity options, and can take on any value between –1 and +1, inclusive.

Price Improvement

This is a percentage value of the price of a real estate property that went to improvements, and is used to compute the depreciation on the property.

Price Lattice

This is the price lattice of an interest-based derivative (e.g., bond option) where the underlying is the term structure of interest rates with its own volatilities.

Principal Repaid

This is the dollar or currency amount indicating the value of principal of debt repaid, and is used to compute the adjusted cash flow to equity of a levered firm.

Probability

This is a probability value between 0% and 100% and used in the inverse cumulative distribution function (ICDF) of any distribution, where given a probability level and the relevant distributional parameters, will return the *X* value of the distribution. For instance, in tossing a coin two times, using the binomial distribution (trials is set to 2 and the probability of success, in this case, obtaining heads in the coin toss, is set to 50%), the ICDF of a 25% probability parameter will return an *X* value of 0. That is, the probability of getting no heads (*X* of zero) is exactly 25%.

Profit Margin

This is the percentage of net income to total sales, and is typically a positive value, although zero and negative values are possible.

Proportion

This is the proportion of defects in a Six Sigma model to determine the requisite sample size to obtain in order to reach the desired Type I and Type II errors, and this value is between 0 and 1, inclusive.

Put Maturity

This is the maturity of the put option, measured in years, and this parameter is a positive value.

Put Strike

This is the contractual strike price for the put option, and has to be a positive value. Sometimes this variable has different suffixes (e.g., Put Strike Sell Low, Put Strike Buy High, and so forth, whenever there might be more than one put option in the portfolio of option strategies, and these suffixes represent whether this particular put is bought or sold, and whether the strike price is higher or lower than the other put option).

Put Value

This is the fair market value of the put option, and sometimes the theoretical price of a put option is used in its place when market information is unavailable. This parameter requires a positive input. Sometimes this variable has different suffixes (e.g., Put Value Sell Low, Put Value Buy High, and so forth, whenever there might be more than one put option in the portfolio of option strategies, and these suffixes represent whether this particular put is bought or sold, and whether the premium paid for this put option or the option value is higher or lower than the other put option).

PV Asset or Present Value of the Asset

This is the ubiquitous input in all real options models, and is the sum of the present values of all net benefits from a real options project or its underlying asset. Sometimes the net present value is used as a proxy, but typically the implementation cost is separated from the PV Asset value, such that PV Asset less any implementation cost, if executed immediately, equals the net present value of the project. The PV Asset input has to be a positive value.

Quantities (Series)

This is a series of positive integers indicating the number of a specific class of options in a portfolio in order to compute the Value at Risk of a portfolio of options, and these values are typically arranged in a column with multiple rows.

Quantity 1 and Quantity 2

These are positive integers indicating the amount of the first asset that is exchanged for the second asset in an asset exchange option with two correlated underlying assets.

Random

This value replaces the Probability value when used to obtain the inverse cumulative distribution function (ICDF) of a probability distribution for the purposes of running a simulation. This variable is between 0 and 1, inclusive, and is from a continuous uniform distribution. By choosing a random value between 0 and 1 with equal probability of any continuous value between these two numbers, we obtain a probability value between 0% and 100%, and when mapped against the ICDF of a specific distribution, it will return the relevant *X* value from that distribution. Then, when repeated multiple times, it will yield a simulation of multiple trials or outcomes from that specific distribution.

Rate of Return

This is the annualized percentage required rate of return on equity, used to compute the price to earnings ratio.

Real Cash Flow

This is the real cash flow level after adjusting and deducting inflation rates. Specifically, the real cash flow plus inflation is the nominal cash flow.

Real Rate

This is the real rate of return or real interest rate after inflation adjustments; in other words, the real rate of return plus the inflation rate is the nominal rate of return.

Receivables

The dollar or currency amount of accounts receivable, a short-term or current asset from the balance sheet, is usually a positive value or zero.

Recovery Period

This is the recovery period in determining the depreciation of real estate investments, in number of years.

Recovery Rate

This is the rate of recovery to determine the credit risk shortfall—that is, the percentage of credit that defaults and the proportion that is recoverable.

Remaining Time

This is the amount of time remaining in years in an Asian option model.

Return on Asset

This is the return on a project or an asset, computed by taking net income after taxes and divided it by total assets, and this parameter value can be positive or negative.

Returns (Series)

These are the percentage returns on various assets in a portfolio, arranged in a column with multiple rows; they can be both negative and positive, and are used to compute the portfolio's weighted average returns.

Revenues

This is the dollar or currency amount of net revenues per year.

Risk-free Rate and Risk-free 0

This is the annualized risk-free rate of government securities comparable in maturity to the underlying asset under analysis (e.g., the risk-free rate with the same maturity as the option), and has to be positive. Risk-free 0 is the default variable for a changing risk-free rate option model, where if the risk-free series is left blank, this single rate is used throughout the maturity of the option.

ROIC

This is the return on invested capital (ROIC), and can be computed using the B2RatiosROIC function, using net operating profit after taxes, working capital, and assets used. This value can be negative or positive.

Row

This is the row number in a lattice, and starts from 0 at the top or first row.

Sales

This is the annual total sales of the company in dollar or currency values and is a positive number. Sales Growth is a related variable that looks at the difference of sales between two periods in percentage, versus Sales Increase, which is the difference in sales but denominated in currency amounts.

Salvage

This is the positive salvage value in dollars or currency value when an option is abandoned; the holder of the abandonment option will receive this amount.

Sample Size

This is the positive integer value of sample size in each subgroup used in the computation of a Six Sigma quality control chart and computation of control limits.

Savings

The positive dollar or currency value of savings when the option to contract is executed—that is, the amount of money saved.

Second Variable

This is the second underlying variable used in a pentanomial lattice, where the underlying asset lattice is the product of the first and second variables; this input parameter has to be positive.

Service Rate

This parameter measures the average rate of service per period (typically per day or per hour)—that is, on average, how many people will be serviced in a queue in a period (e.g., per hour or per day). This value has to be positive.

Shape

This is the second input assumption in the Pareto distribution, determining the shape of the distribution, and is a positive value.

Share Price or Equity Price

This is the current share or stock price per share at the time of valuation, used in a variety of options models, and has to be a positive dollar or currency value.

Shares

This is the number of outstanding shares of a stock, and is a positive integer.

Sigma

This is the variation or standard deviation measure of variation within a process and is used in Six Sigma quality control models. This parameter has to be a positive value.

Sigma Service Rate

This is the variation or standard deviation measure of variation within the service rate used in Six Sigma process and quality control models. This value has to be a positive value.

Single Interest

This is the interest rate used in computing a bond's convexity and duration models, the second- and first-level sensitivities, respectively. This input parameter has to be a positive value.

Single Period

This is the period in years or months that is used to interpolate the missing value within a range of values, applied in the B2LinerInterpolation model (used together with the Time Periods series and corresponding Values series).

Skewness

This is the third moment or measure of skew in a distribution. This input parameter is used in an Alternate Distribution option model, where the underlying distribution of the asset returns is assumed to be skewed and has some kurtosis. This value can be either positive or negative.

S Max

This is the observed maximum stock price in the past in an extreme spread option, where such options have their maturities divided into two segments, starting from time zero to the First Time Period (first segment) and from the First Time Period to Maturity (second segment). An extreme spread call option pays the difference between the maximum asset value from the second segment and the maximum value of the first segment. Conversely, the put pays the difference between the minimum of the second segment's asset value and the minimum of the first segment's asset value. A reverse call pays the minimum from the first segment less the minimum of the second segment, whereas a reverse put pays the maximum of the first segment less the maximum of the second segment. This variable is the observed maximum stock value in the observable past.

S Min

This is the observed minimum stock price in the past in an extreme spread option, similar to the S Max variable as described previously.

Spot FX Rate

This is the input in a currency option, which is the current or spot exchange rate, computed by the ratio of the domestic currency to the foreign currency; it has to be a positive value.

Spot Price

The spot price is the same as the existing or current stock price, and is a positive value. We use this definition to differentiate between the spot and average or future price levels, and this parameter has to be positive.

Spot Rate, Spot Rate 1, and Spot Rate 2

This is the input in an exotic currency forward option, which is the current or spot interest rate, and has to be a positive value.

Spot Volatility

This is the commodity option's spot price return's annualized volatility, as measured by the zero bond price level, and this value has to be positive.

Spread

Certain types of debt come with an option-embedded provision; for instance, a bond might be callable if the market price exceeds a certain value (when prevailing interest rates drop, making it more profitable for the issuing company to call the debt and reissue new bonds at the lower rate) or prepayment allowance of mortgages or lines of credit and debt. This input is the option adjusted spread (i.e., the additional premium that should be charged on the option provision). This value is computed using an optimization or internal search algorithm.

Standard Deviation

The standard deviation or sigma is the second moment of a distribution, and can be defined as the average dispersion of all values about the central mean; it is an input into the normal distribution. The higher the sigma level, the wider the spread and the higher the risk or uncertainty. When applying it as a normal distribution's parameter, it is the standard deviation of the population and has to be a positive value (there is no point in using a normal distribution with a sigma of zero, which is nothing but a single point estimate, where all points in the distribution fall exactly at the mean, generating a vertical line).

Standard Deviation of Demand

This is the measure of the variability of demand as used in the determination of economic order quantity, and this value is either zero or positive.

Standard Deviation of Lead Time

This is the measure of the variability of lead time it takes to obtain the inventory or product after it is ordered, as used in the determination of economic order quantity, and this value is either zero or positive.

Starting Plot

This variable is used in the options trading strategies (e.g., straddles, strangles, bull spreads, and so forth), representing the first value to plot for the terminal stock price (the x-axis on an option payoff chart); it has to be lower than the Ending Plot value, and is a positive input.

Steps

This is a positive integer value (typically at least 5) denoting the total number of steps in a lattice, where the higher the number of steps, the higher the level of precision but the longer the computational time.

Stock

This is the current stock price per share at the time of valuation, used in a variety of options models, and has to be a positive dollar or currency value.

Stock Index

This is the stock index level, and must be a positive value, measured at the time of valuation; it is used in index options computations.

Stock Prices (Series)

This is a list of stock prices over time in a series as used in the GARCH volatility model (B2GARCH) or computation of the Sharpe ratio (B2SharpeRatio), listed in chronological order (e.g., Jan, Feb, Mar, and so forth) in a single column with multiple rows, versus stock prices at valuation dates for various options in a portfolio, when used to compute the portfolio's Value at Risk (B2VarOptions).

Stock Volatility

This is the same as Equity Volatility or simply Volatility described in this Glossary (and used interchangeably), but this definition is used when multiple volatilities are required in the model, in order to reduce any confusion.

Strike, Strike 1, and Strike 2

The strike price in an option is the contractually prespecified price in advance at which the underlying asset (typically a stock) can be bought (call) or sold (put). Holding everything else constant, a higher (lower) strike price means a lower (higher) call option value and a higher (lower) put option value. This input parameter has to be a positive value, and in some rare cases it can be set to zero for a costless strike option. Strike 1 and Strike 2 are used when referring to exotic option inputs with two underlying assets (e.g., exchange options or a 3D binomial model).

Strike Bought

This is the positive dollar or currency strike price of an option (usually a call) purchased in a Delta-Gamma hedge that provides a hedge against larger changes in the underlying stock or asset value. This is done by buying some equity shares and a call option, which are funded by borrowing some amount of money and selling a call option at a different strike price. The net amount is a zero sum game, making this hedge costless.

Strike Extend

This is the positive value of the new strike price in a writer extendible option, which is an insurance policy in case the option becomes worthless at maturity. Specifically, the call or put option can be automatically extended beyond the initial maturity date to an extended date with a new extended strike price, assuming that at maturity the option is out of the money and worthless. This extendibility provides a safety net of time for the holder of the option.

Strike FX Rate

This is the positive dollar or currency value of the contractual strike price denominated in exchange rates (domestic currency to foreign currency) for a foreign exchange option.

Strike Rate

This is the positive percentage value of the contractual strike price in a swaption (option to swap) or a futures option.

Strike Sold

This is the positive dollar or currency strike price of an option (usually a call) sold in a Delta-Gamma hedge that provides a hedge against larger changes in the underlying stock or asset value. This is done by buying some equity shares and a call option, which are funded by borrowing some amount of money and selling a call option at a different strike price. The net amount is a zero sum game, making this hedge costless.

Successes

This is the number of successes in the negative binomial distribution, which is useful for modeling the distribution of the number of additional trials required on top of the number of successful occurrences required. For instance, in order to close a total of 10 sales opportunities, how many extra sales calls would you need to make above 10 calls, given some probability of success in each call? The x-axis of the distribution shows the number of additional calls required or the number of failed calls. The number of trials is not fixed; the trials continue until the required number of successes, and the probability of success is the same from trial to trial. The successes input parameter has to be a positive integer less than 8,000.

Success Probability

This is a probability percent, between 0% and 100%, inclusive, for the probability of an event occurring, and is used in various discrete probability distributions such as the binomial distribution.

Tails

This is the number of tails in a distribution for hypothesis testing as applied in Six Sigma models to determine the adequate sample size for specific Type I and Type II errors. This parameter can only be either 1 or 2.

Tax Rate

This is the corporate tax rate in percent and has to be a positive value.

Tenure

This is the maturity of a swaption (option to swap).

This Category

This is the category index number (a positive integer—1, 2, 3, and so forth), to compute the relative width of the credit rating table.

Time, Time 1, and Time 2

The Time variable is in years (positive value) to indicate the specific time period to forecast the interest rate level using various yield curve models, whereas Time 1 and Time 2 are the years for different spot rates, in order to impute the forward rate between these two periods.

Time Interval or DT

This is the positive time step input used in a time switch option, where the holder of the option receives the Accumulated Amount $\times$ Time Steps each time the asset price

exceeds the strike price for a call option (or falls below the strike price for a put option). The time step is how often the asset price is checked as to whether the strike threshold has been breached (typically, for a one-year option with 252 trading days, set DT as 1/252).

Time Periods (Series)

This is a series of positive time periods in years, arranged in a column with multiple rows, concurrent with another column of values, so that any missing values within the range of the time periods can be interpolated using the B2LinearInterpolation model. The time periods do not have to be linearly and sequentially increasing.

Timing (Series)

This is a series of positive time periods in years, arranged in a column with multiple rows, concurrent with another column of cash flows, so that the present value or price of the bond or some other present value computations can be done. Typically, the timing in years is linearly increasing.

Total Asset

This is the total assets in a company, including all short-term and long-term assets, and can be determined from the company's balance sheets. Typically, this parameter is a positive value, and is used in financial ratios analysis.

Total Capital

This is the total dollar or currency amount of capital invested in order to compute the economic value added in a project.

Total Category

This is a positive integer value in determining the number of credit rating categories required (e.g., AAA, AA, A, and so forth). Typically, this value is between 3 and 12.

Total Debt

This is the total debt in a company, including all short-term and long-term debt, and can be determined from the company's balance sheets. Typically, this parameter is zero or a positive value, and is used in financial ratios analysis.

Total Equity or Equity Value

This is the total common equity in a company, and can be determined from the company's balance sheets. Typically, this parameter is zero or a positive value.

Total Liability

This is the total liabilities in a company, including all short-term and long-term liabilities, and can be determined from the company's balance sheets. Typically, this parameter is zero or a positive value, and is used in financial ratios analysis.

Trading Ratio

This is the number of trading days left until maturity divided by the number of trading days in a year (typically around 250 days), and is used to compute the plain-vanilla option value after adjusting for the number of trading days left; it is typically a positive value.

Trials

This value is used in several places. For a probability distribution, it denotes the number of trials or events (e.g., in a binomial distribution where a coin is tossed 10 times, the number of trials in this case is 10) or denotes the number of simulation trials and iterations to complete in order to compute the value of an option using the simulation approach. Regardless, this parameter has to be a positive integer.

Units

This is the positive integer value denoting the number of units sampled in a Six Sigma quality control study, to determine the number of defects and proportion of defects.

Units Fulfilled

This zero or positive integer input variable is used in the Time Switch option model, where in such an option, the holder receives the Accumulated Amount $\times$ Time Steps each time the asset price exceeds the strike price for a call option within the maturity period (or falls below the strike price for a put option). Sometimes the option has already accumulated past amounts (or as agreed to in the option as a minimum guaranteed payment) as measured by the number of time units fulfilled (which is typically set at zero).

Unlevered Cost of Equity

This is the cost of equity in an unlevered firm with no debt, and has to be a positive value, used to compute the weighted average cost of capital for a company.

Up

This is the up step size used in an asymmetrical state option pricing model, and needs to be a value greater than 1.

Upper Barrier

This is the upper barrier stock price in a double barrier or graduated barrier option, where this barrier is typically higher than the existing stock price and higher than the lower barrier level; it must be a positive value.

Upper Delta

This is the instantaneous options delta (a Greek sensitivity measure that can be computed using the B2CallDelta or B2PutDelta functions) of the percentage change in option value given the instantaneous change in stock prices, for the upper barrier stock price level. This value is typically set at zero or a positive value.

Upper Strike

This is the upper strike price (a positive value) in a Supershare option, which is traded or embedded in supershare funds, and is related to a Down and Out, Up and Out double barrier option, where the option has value only if the stock or asset price is between the upper and lower barriers, and at expiration provides a payoff equivalent to the stock or asset price divided by the lower strike price.

Upper Value

This input variable is used in the B2DT lattices for computing option adjusted spreads in debt with convertible or callable options, and represents the value that is one cell adjacent to the right and directly above the current value in a lattice. All values in a lattice and this input must be positive.

USL

This is the upper specification level of a Six Sigma measured process—that is, the prespecified value that is the highest obtainable value or a value that the process should not exceed.

Vacancy Factor and Collection Factor

This is the percentage (between 0% and 100%) where the ratio of vacancies or noncollectable rent occurs as a percentage of 100% occupancy, and is used in the valuation of real estate properties.

Values (Series)

This is a series of values or numbers, either negative of positive values, arranged in a column with multiple rows, to be used in concert with the Time Period variable, where any missing values can be interpolated and internally fitted to a linear model. As an example, suppose the following series of time periods and values exist (Time 1 = 10, Time 2= 20, Time 5 = 50); we can then use the B2LinearInterpolation model to determine the missing value(s).

Vesting Year

This is the number of years or partial years in which the option is still in the vesting period and cannot be executed. This vesting year period can range from zero to the maturity of the option (the latter being a no-vesting American option, whereas the latter reverts to a European option), and if the value is somewhere in between, it becomes a Bermudan option with blackout and vesting periods.

Volatilities (Series)

This is a series of annualized volatilities (see the definition of Volatilities for more details) arranged in a row with multiple columns going across, for use in the valuation of risky debt and callable bonds or bond spreads. Each value in the series must be positive.

Volatility

This is the annualized volatility of equity or stock prices; it has to be a positive value, and can be computed in various ways—for example, exponentially weighted moving average (EWMA), generalized autoregressive conditional heteroskedasticity (GARCH) , logarithmic relative returns, and so forth. Review the volatility examples and models in the Modeling Toolkit to obtain details on these methodologies.

Volatility 0, 1, 2

These volatility variables are computed exactly as discussed in the Volatility definition, but the difference is that for Volatility 0, this is the default volatility used in a customized option model with changing volatilities (that is, if the changing volatilities input is left empty, this Volatility 0 will be used as the single repeated volatility in the model), whereas Volatility 1 and 2 are the volatilities for the first underlying asset and the second underlying asset in a multiple asset option model. These values have to be positive values.

Volatility FX or Volatility Foreign Exchange Rate

This is the annualized volatility of foreign exchange rates (see the Volatility definition for the various methods applicable in valuing this parameter), and this value has to be positive.

Volatility Ratio

This variable is used in the Merton Jump Diffusion models, where this ratio is the percentage of volatility that can be explained by the jumps, and is typically a positive value not exceeding 1.

WACC

The weighted average cost of capital (WACC) is the average cost of capital from common equity, debt (after tax), and preferred equity, all weighted by the amount obtained from each source. It has to be a positive value, and when used in perpetual firm continuity values with growth rates, WACC has to be greater than the growth rate parameter.

Warrants

This is the positive integer number indicative of the total number of warrants issued by the company.

Working Capital

This is also known as the net working capital of a company and can be determined using the company's balance sheet, and is typically a positive dollar or currency value (while zero is a rare but possible occurrence).

Worst Case

This is the worst-case scenario's dollar or currency value of a project or asset within a one-year time frame, and is used in the implied volatility (volatility to probability) estimation. When used together with the Best Case and Expected Value input parameters, this worst case value has to be less than these two latter inputs.

X

This is the ubiquitous random variable X, and is used in multiple locations. When used in probability distributions, it denotes the X value on the x-axis of the probability distribution or the specific outcome of a distribution (e.g., in tossing a coin 10 times, where the probability of getting heads is 50%, we can compute the exact probability of getting exactly four heads, and in this case, $X = 4$). X is typically a positive value (continuous values in continuous distributions, and discrete positive values, including zero, for discrete probability distributions).

Z1 and Z2

These are the standard normal z-scores used in a bivariate normal distribution. These values can be either negative or positive.

Zero Bond Price

This is the price of a zero coupon bond, used in the valuation of callable and risky debt and for pricing commodity options, and this parameter has to be a positive value.

Zero Yields

This is the yield of a zero coupon bond, used in the valuation of callable and risky debt, and this parameter has to be a positive value.