

ROV MODELING TOOLKIT 2011

- Biblioteca con 300 modelos de plantilla y cerca de 800 modelos en Excel
- Trabaja complementariamente con Risk Simulator y aplicaciones del Real Options SLS
- Cubrimiento detallado de temas incluyendo las áreas generales de
 - Análisis
 - Modelos Bancarios
 - Análisis Crediticio
 - Analisis de Deuda
 - Analisis de Decision
 - Opciones Exóticas
 - Pronósticos
 - Aplicaciones a la Industria
 - Optimización
 - Análisis de Opciones
 - Probabilidad de Incumplimiento
 - Direccion de Proyectos
 - Real Options SLS
 - Análisis de Riesgo
 - Cobertura de Riesgo
 - Sensibilidad
 - Simulación
 - Six Sigma
 - Valoración
 - Valor en Riesgo
 - Volatilidad
 - Curva de Rendimiento

ROV Real Options
Valuation
L.P.C.

R R I S S K
R R I S S K

ROV MODELING TOOLKIT comprende cerca de 800 modelos analíticos, funciones y herramientas, y cerca de 300 plantillas sobre modelos analíticos Excel/SLS, hojas de cálculo que cubren las áreas de análisis de riesgo, simulación, pronósticos, análisis de riesgo Basilea II, riesgo de crédito y defecto, modelos estadísticos y mucho más! Este kit es un set de sofisticados modelos matemáticos escritos en C++ y vinculados a hojas de cálculo de Excel. Hay un total de 1100 modelos, funciones, con hojas de cálculo y plantillas SLS que cubren las áreas de:

Análisis: 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

Modelos Bancarios: 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

Análisis de Crédito: 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

Análisis de Decisión: 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

Opciones Exóticas: 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

Pronósticos: 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

Aplicaciones a la Industria: 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

Optimización: 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

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

Probabilidad de Incumplimiento: Empirical (Individuals), External Options Model (Public Company), Merton Internal Model (Private Company), Merton Market Options Model (Industry Comparable), Yields and Spreads (Market Comparable)

Dirección de Proyectos: Cost Estimation Model, Critical Path Analysis (CPM PERT GANTT), Project Timing

Opciones Reales 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

Opciones Exóticas: 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

Análisis de Opciones: 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



Opciones Reales: 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 Quadrant 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

Enrejados Trinomiales: 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

Enrejados Cuadrinomiales: Jump Diffusion American Call Option, Quadrant Lattices: Jump Diffusion American Put Option, Quadrant Lattices: Jump Diffusion European Call Option, Quadrant Lattices: Jump Diffusion European Put Option

Enrejados Pentanomiales: 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)

Análisis de Riesgo: Integrated Risk Analysis, Interest Rate Risk, Portfolio Risk and Return Profile

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

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

Simulación: 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

Valoración: 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

Valor en Riesgo: Optimized and Simulated Portfolio VaR, Options Delta Portfolio, Portfolio Operational and Capital Adequacy, Right Tail Capital Requirements, Static Covariance Method

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

Curva de Rendimiento: 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

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 Quadrnomial 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
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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
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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
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- 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 $[\max(X_2 - Q_2S_2, Q_1S_1 - X_1)]$ 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 put 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. $\text{Alpha} < 1$: call starts $(1 - A)\%$ in the money, put starts $(1 - A)\%$ out of the money. $\text{Alpha} > 1$: 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 $\text{Futures 1} - \text{Futures 2}$, and the call payoff is $\text{Spread} - \text{Strike}$.

385. B2FuturesSpreadPut

The payoff of a spread option is the difference between the two futures' values at expiration. The spread is $\text{Futures 1} - \text{Futures 2}$, and the put payoff is $\text{Strike} - \text{Spread}$.

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. B2SixSigmaControlIXMRChartLCL

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. B2SixSigmaControlIXMRChartUCL

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 $\text{AccumAmount} \times \text{TimeSteps}$ 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 $\text{AccumAmount} \times \text{TimeSteps}$ 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 volatilities 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. B2ZEOB HoldingCost

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: Quadrinomials
- 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 $\text{Alpha} < 1$, then a call option starts $(1 - \text{Alpha})\%$ in the money (a put option will be the same amount out of the money), or if $\text{Alpha} > 1$, then the call starts $(\text{Alpha} - 1)\%$ 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. $1 - \text{Alpha}$ 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 Gamma 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. $1 - \text{Beta}$ 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% ($1 - 2 \times \text{Alpha}$) 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, quadrinomial, 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 or 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.