Index

1/N rule (shrinkage estimators), 137, 143

active investors, 189 adjusted spread duration, 376 Allais problem, 34 allocation, 9 a priori probability, 2, 6 a priori risk, 244 arbitrage limits of, 59-60 no-arbitrage, 58-66, 193 arbitrage pricing theory, 187, 192-199 ARCH (Auto-Regressive Conditional Heteroskedasticity) modeling, 293-296 variants, 297-300 ARMA process, 292 Arrow-Debreu contingent claims, 66 asset-liability management, 410-413 asset-liability mismatch, 406 asset liquidity, 420-422 asymmetric model (dynamic conditional correlations), 329 asynchronous trading, 306 attachment point, 319 autocorrelation function, 290 autocovariance function, 290 autopredictive, 289 autoregressive, 295 autoregressive of order p (AR), 290 averaging, see also Central Limit Theorem; mean value, 231 Bachelier, Louis, 123

background noise, 33 backtracking (convex optimization), 168 bank franchise hedging, 406–410 bank runs, 407–410 barrier algorithm, 182 barrier methods (convex optimization), 180–186 base correlation, 322 basis risk, 96–97, 422 Bayes, Thomas, 141 Bayes's Rule, 139–142 behavioral economics, see also personal preference, 35 benchmark portfolio, 136-137 Bernoulli, Daniel, 20-21 Berry-Esseen Theorem, 212 betas (cost-of-capital), 191 binary (or digital) options, 66 binomial distribution, 211 Black, Fischer, 154 Black-Litterman, 154-158 Black-Scholes option formula, 123, 272, 278, 283-284 block maxima, 234-236 bond defaults, see defaulting bonds duration calculations, 93-95 interest rate swaps, 413-416 investment grade and speculative grade, 340-342 market ages, 217-220 price changes as rates change, 91-93 as security, 14 sovereign debt ratings, 348 types of, 87 bootstrapping, 101 Borel algebra, 16 Box, George, 39 Box's M Test, 150 Breeden-Litzenberger process, 283-284 budget constraint, 124 bullet bond, 88 burn-in, 259 business cycles, 105 butterfly spread, 427 call option Black-Scholes option formula, 272 distribution reshaping, 423-429 quantity-adjusting (quanto), 391-395

straddle, 273, 274

terminology, 270

call premium, 271

call schedule, 373

VIX®R calculations, 286-289

More Information

610 Index

call spread, 425 call writer, 270 callable bond, 88 Capital Asset Pricing Model (CAPM), 154, 187, 190–192, 387 capital market line, 134-136 capital markets, 12-15 capitalism, meaning of, 13 capitalization-weighted indices, 137 caplets (derivatives), 433-434 caps (derivatives), 433-434 cash flow, 89 cash, risk measurement, 54 cash settled, 271, 383 Cauchy distribution, 229 causation, see also correlation relationships, 302 caveat laws, 37-42 Cboe Volatility Index, see also VIX®R, 274 central banks, 86 central counterparties (CCPs), 416-418 Central Limit Theorem, 210-220 causes of non-normality, 216-217 checking normality, 213-215 generalized, 227 Jarque-Bera, 215 market ages, 217-220 central moments, 223 centrally cleared, 384 certainty effect, 35 characteristic equation, 291 characteristic function, 17 Chebyshev's inequality, 217 Cholesky factorization, 254 coefficient of absolute risk aversion, 29 coefficient of absolute risk tolerance, 31 coefficient of relative risk aversion, 30 coherent risk, 53-56 collars (derivatives), 433-434 collateralized debt obligations (CDOs), 318 commodities and correlation relationships, 309-312 commodity contracts, 14 concave utility functions, 27-28 concavity (bonds), 94 conditional correlation, 305-309, 325-332 conditional probability, 15 conditional Value at Risk (cVaR), 46 Constant Absolute Risk Aversion (CARA), 30 constant conditional correlation (CCC), 325-332 constant proportion portfolio insurance (CPPI), 40

Constant Relative Risk Aversion (CRRA), 30 constant residual eigenvalue method, 206 constrained convex optimization, 173-180 constraints (optimization), 161 continuous discount factor, 85 conversion equation, 359 convex optimization, 159 barrier methods, 180-186 constrained, 173-180 terminology, 159-161 unconstrained, 165-173 convex properties, 161-164 convex risk measures, 55 convex utility functions, 27-28 convexity, 94, 162 convexity hedging, 434-439 copula functions, 316-322 Cornish-Fisher Expansion, 252-253 correlation relationships, 301 and causation, 302 conditional correlation, 305-309, 325-332 copula functions, 316-322 and the economy, 309-312 historical estimation of correlation matrices, 322-325 implied correlations, 312-316 MacGyver method, 333-334 Pearson correlation, 301-303 Spearman correlation, 303-305 time series estimates, 325-332 correlation targeting (dynamic conditional correlations), 329 cost of capital, 60 countercyclicality, 324 counterparty risk, 60, 383, 416-418 covariance matrices copula functions, 316-322 efficiency frontiers, 138 equality of, 150 historical estimation, 322-325 principal components analysis, 205, 208 shrinkage estimators, 144 covariance stationarity, 290 covariance, time series estimates of, 325-332 COVID-19 pandemic volatility, 275 yield curve, 99-100 Cramer, Gabriel, 20-21 Credit Default Swaps (CDS) writer, 383 credit event, 383 credit modeling, 335 basic credit risk concepts, 335-337 Credit Default Swaps (CDS), 383-386

More Information

Index

611

credit modeling (cont.) credit factor models, 375-376 credit spread correlates, 371-372 credit spread metrics, 372-374 credit spread premium puzzle, 354-357 implied default rates, 381-382 Merton model, 357-371 z-scores, reduced-form, and hybrid models, 377-380 credit ratings, 337-354 agencies, 335, 341 historical default frequencies, 342-347 investment grade and speculative grade, 340 predictive power of default estimates, 368-371 sovereign debt ratings, 348-352 sovereign spreads, 352-354 credit risk, definition of, 335 critical point (optimization), 160 crowded trade, 41 cumulative density function (cdf), 226 cumulative distribution function (cdf), 17, 44 currency forward, 388 debt sovereign debt ratings, 348-352 sovereign spreads, 352-354 debt-to-firm value ratio, 360 default-free rate, 83, 86-88 defaulting credit default swaps, 383-386 expected default frequencies, 366 historical default frequencies, 342-347

implied default rates, 381-382 predictive power of default estimates, 368-371 quantitative prediction methods, 377-380 sovereign debt ratings, 348-354 deflation, 81-84 delta-gamma, 257 delta-gamma-theta simulations, 257 delta hedging, 433 delta-normal, 248-253 comparison to Monte Carlo, 255 demand deposits, 406 depositor confidence, 408 derivative securities, 272, 433-434 detachment point, 319 diffusion (stochastic processes), 111 discount curves, 103 discount factors, 85 stochastic, 68-72 discount rate, 85

discounting, 85-86 discrete discount factor, 85 discrete distributions, 47-49 discrete random variables, 16 distance to default, 358 distribution reshaping (hedging), 422-423 fixed income options, 433 option Greeks, 429-433 with options, 423-429 distributions, 210 Central Limit Theorem, 211-220 extreme value distributions, 231-237 mixtures of normals, 222-226 stable distributions, 226-230 Student's T distribution, 220-221 tail distributions, 237-243 diversification, 10, 125, 131 domains of attraction, 236-237 downside semi-variance/downside semi-standard-deviation, 43 Dupire volatility modeling, 283-284 duration calculations (bonds), 93-96 Duration Times Spread (DTS), 375 dynamic conditional correlations (DCC), 325-332 economic data, and market data, 261-265 economics terminology, 9-12 the economy commodities and correlation relationships, 309-312 Global Financial Crisis, 315 Global Financial Crisis, 99-100, 409 historical estimation of correlation matrices, 323 effective convexity, 374 effective duration, 373 efficiency, meaning of, 188 efficient frontier, see also Markowitz efficient frontier, 125, 133-134 resampled, 151-154 Efficient Market Hypothesis (EMH), 188-190 EGARCH model, 297-300 eigenvalues convex functions, 167 discount factors, 72 parameter estimation methods, 139 principal components analysis, 200-209 Spectral Decomposition Theorem, 166 yield curves, 107 endogenous data, 203 Engle, Robert, 293-296, 333 enterprise value, 361-363

More Information

612 Index

example, 361-363 iterative enterprise value, 363-365 KMV model, 365-368 equal-weighting, 137 equality constraints (optimization), 161 equality-constrained frontier, 126-131 equity factor risk modeling, 198-200 equity modeling, see also Markowitz efficient frontier; parameter estimation methods, 123 equity tranche, 319 estimates 2 Euler Rule, 251 European call option, 270 eurozone, 352-354 events (sample space), 15 exceedance count, 240 exceedance set, 240 execution risk. 60 exercised the option, 270 exogenous data, 202 expectation operator, 17 expectations hypothesis, 111 expected default frequencies (EDFs), 366 expected loss, 336 expected return, 194 Expected Shortfall (ES), 46 expected utility of returns, 133-135 expected value equality-constrained frontier, 129 Vasicek model, 119-120 expiration (options), 270 exponentially weighted moving average (EWMA), 246, 323 extreme value distributions, 231-237 extremum (optimization), 160, 161 factor models, 187-188 arbitrage pricing theory, 187, 192-198 Capital Asset Pricing Model, 187, 190-192 Efficient Market Hypothesis, 188-190

Efficient Market Hypothesis, 187, 190–192 Efficient Market Hypothesis, 188–190 four-factor model, 192 in practice, 198–200 principal components analysis, 200–209 fallen angels (bonds), 342 Fama, Eugene, 188 Fama–French–Carhart model, 192 fat-tailed distributions, 210, 214 mixtures of normals, 222–226 modeling relationships, 301 Federal Deposit Insurance Corporation (FDIC), 409 FICO scores, 338 financial capital capital markets terminology, 12-15 Financial Services Compensation Scheme, 410 finite probability, 3-4 Fisher z-test, 302 Fisher z-transform, 302 fixed-income collar, 433 fixed-income investing, 81 approximations and basis risk, 96-97 fixed-income mathematics, 89-90, 96-97 credit factor models, 375-376 duration calculations, 93-95 generic pricing equation, 90-91 price changes as rates change, 91-93 fixed-income options, 433-434 fixed payers, 411 fixed receivers, 411, 416-418 flat curves, 98 float-weighting, 137 floating rate instruments, 335 floors (derivatives), 433-434 Fokker-Plankk equation, 283-284 forward curves, 103, 109-111 forward market, 388 forward rate, 109-111, 389 forward-starting swap rates, 415 four-factor model, 192 fractional reserve banking, 407 franchise preservation, 395-397 asset-liability management, 410-413 bank franchise hedging, 406-410 interest rate swaps, 413-416 longevity risk, 419-420 Modigliani-Miller Indifference Theorem, 402-406 Siegel's Paradox, 397-402 Fréchet distribution, 232 frontier leverage, 138 functional magnetic resonance imaging (fMRI), 42 future money discounting, 85-86 fixed income investing, 81, 89-90 generic pricing equation, 90-91 real and nominal rates, 82-84 future volatility, 273-276 futures markets, 422 Gamma function, 233

gamma trade, *see also* delta-gamma, 426, 431, 437

More Information

Index

613

GARCH (Generalized Auto-Regressive Conditional Heteroskedasticity) modeling, 293-296 historical estimation of correlation matrices, 323 time series estimates, 325-332 variants, 297-300 Gaussian copulas, 318-322 Gaussian Mixture Models, 226 Generalized Central Limit Theorem, 227 generalized extreme value (GEV) distribution, 232 generalized least squares (GLS), 155 generic pricing equation, 90-91 geometric Brownian motion, 113 Gibbs Sampler, 260-265 GJR-GARCH model, 297-300 Global Financial Crisis (GFC) government intervention, 409 risk-on/risk-off regimes, 315 vield curve, 99-100 global minimum variance portfolio, 131, 307 gold hedging, 404 Goodhart's Law, 38 Gosset, William, 220 government debt ratings, 348-352 sovereign spreads, 352-354 government intervention, in banks, 409 gradient descent method (convex optimization), 167, 184 gradient (optimization), 159 Gross Domestic Product (GDP), 262 Gumbel distribution, 232, 237, 241 Hansen-Jagannathan bound, 71 HARA (Hyperbolic Absolute Risk Aversion), 31 Hayek, F. A., 11-12 hazard rate model, 385 hedge portfolios, 194 hedging, see also franchise preservation, 387 convexity hedging, 434-439 distribution reshaping, 422-423 illiquidity hedging, 420-422 risk unbundling, 387-395 Herfindahl-Hirschman index, 142 Hessian matrix, 160, 257 Heston variance model, 283 heteroskedasticity, 294 high yield bonds, 340-342, 354-357 histograms, 231, 234 historical default frequencies, 342-347

historical estimation, of correlation matrices, 322-325 historical simulation, 245-248 historical volatility, see also time-varying volatility, 267-270 homoskedasticity, 294 Hotelling's T statistics, 148 house prices, 310-311 Hull-White model, 119 human capital, 12 hybrid credit models, 377-380 hypothetical scenario analysis, 266 idiosyncratic behavior (arbitrage pricing theory), 195-198 illiquidity hedging, 420-422 implied correlations, 312-316 implied default rates, 381-386 implied forward curves, 109-111 implied short rate/implied instantaneous rate, 114 implied volatility, 273 importance ranking, 247 individual preference, see personal preference inequality constraints (optimization), 161 inflation, 82-84 information ratio, 137 innovations (time series), 290 insurance bank failures, 409 Credit Default Swaps (CDS), 383-386 longevity and mortality risk, 419 for portfolio, 39-42 integrated model(dynamic conditional correlations), 329 inter-p-tile range, 44 interest rate swaps asset-liability management, 410-413 market, 416-418 simplified model, 413-416 interest rates concavity, 94 convexity, 94 credit spread correlates, 371 fixed income modeling, 81, 86-88, 91-93 price changes as rates change, 91-93 Sharpe Ratio, 50 vield curves, 97-98 intermediate-term loans, 99-100 internal rate of return, 90, 102 interpolation, yield curves, 107-109 interquartile range, 44 inverted yield curves, 105-107

More Information

614 Index

investment grade bonds, 340-342, 354-357 investments, see also hedging active vs passive investors, 189 collateralized debt obligations (CDOs), 318 commodities and correlation relationships, 309-312 discounting, 85-86 fixed income investing, 81, 86-90 Markowitz efficient frontier, 123 risk-free rate, 86-88 robo-investing, 32, 158 utility theory and wealth management, 32 isoprobability, 57 iterative enterprise value, 363-365 Jackwerth, Jens Carsten, 77-78 James-Stein shrinkage estimator, 143, 148 Jarque-Bera, 215 Jensen's Alpha, 51 Jorion shrinkage estimator, 144, 148 k-period discrete discount factor, 85 Karush-Kuhn-Tucker (KKT) conditions, 178 - 180Kepler, Johannes, 80 key rate durations, 105-107 KMV credit modeling, 365-368 Knight, Frank finite probability, 3-4 knowledge of the future, 2-3 uncertainty, 4-6 Knightian risk, 4, 6, 9-12, 265-266 knockout options, 373 kurtosis, 18, 215, 225, 252 Lévy distribution, 229 Lagrange duality, 175 Lagrange multipliers, 127, 174 Law of One Price, 59 least squares, 155 Ledoit-Wolf constant-correlation covariance shrinkage estimator, 145 leptokurtic, see fat-tailed distributions Levene's Test, 149, 150 Lindeberg-Levy form, 212 liquidity, and hedging, 420-422 Litterman, Robert, see also Black-Litterman, 154 local maximum, 160 local minimum, 160 local volatility modeling, 283-284 Log-Maximum-Likelihood (LML), 234, 240 lognormal process, 113

long-only efficient frontier, 132 long position (assets), 61 long-term loans, 99-100 longevity risk, 419-420 loss given default (LGD), 336 Lucas Critique, 38 Lyapunov-Lindeberg form, 212 Macaulay duration, 92-95 MacGyver method of correlation, 333-334 Mahalanobis Distance, 143 Mandelbrot, Benoit, 210, 216, 226, 228 Marchenko-Pastur PDF, 205 margin call, 62 marginal distributions, 316 margins, 62, 271 market ages, 217-220 market-clearing price, 58 market data and economic data, 261-265 historical volatility, 267-270 stress testing and scenario analysis, 265-266 market efficiency, see also efficient market hypothesis, 188 market liquidity, 420-422 market-neutral strategies, 387 Markov Chain Monte Carlo, 258-265 Markov process, 113, 115-116, 291 Markov's inequality, 217 Markowitz efficient frontier, 123-126 benchmark-relative, 136-137 capital market line, 134-136 efficient frontier and utility functions, 133-134 equality-constrained frontier, 126-131 inequality constraints, 131-132 theory and practice, 138-139 Markowitz, Harry, 123 martingale (stochastic processes), 113 maturity (options), 270 maximum domain of attraction, 236-237 mean absolute deviation (MAD), 43 mean-reverting model (dynamic conditional correlations), 329 mean value, 17 measurable space, 15 median, 18 Menner, Marco, 77-78 Merton credit modeling, 357-371 enterprise value example, 361-363 iterative enterprise value, 363-365 KMV model, 365-368

More Information

Index

615

Merton credit modeling (cont.) predictive power of default estimates, 368-371 term structure, 359-360 volatility, 297 Merton, Robert, 297 method of block maxima, 234-236 Metropolis-Hastings Algorithm, 259 mezzanine tranche, 319 Michaud, Richard, 153 mixtures of normals, 267, 278 Modified duration, 92 Modigliani and Modigliani (M²) measure, 52 Modigliani-Miller Indifference Theorem, 402-406 monetary policy, Eurozone, 352-354 money market account, 54 money, functions of, 10-12 moneyness, 276-278 Monte Carlo simulations, 253-258 comparison to delta-normal, 255 yield curves, 117 Moody's Analytics, 366 Moody's credit ratings, 341-347, 354-357 Morgenstern, see von Neumann Morgenstern (VNM) theory Morini, Massimo, 284-285 mortality risk, 419 mortgages convexity hedging, 434-439 house prices, 310-311 triggering a run on the bank, 407 moving average (MA) process, 292 natural probability, 68 Nelson-Siegel curve, 107-109 Newton's Method (convex optimization), 171-173 no-arbitrage, 58-66, 193

no-arbitrage, 58–66, 193 nominal rates, 82–84 non-callable coupon bond, 88 nonstationary time series, 290 normal distribution, 211, 267–270 normality, 210 causes of non-normality, 216–217 checking with Q-Q and P-P plots, 213–215 mixtures of normals, 222–226 notional amount, 411

objective function, 159, 161 off-the-run bond, 88 Omega Ratio, 53 on-the-run bond, 88 optimization, see also convex optimization, 159 option implied correlations, 312-316 option-adjusted spread duration (OASD), 374 option-adjusted spread (OAS), 373 option American call, 270 option-implied volatilities, 312-316 optionality period, 437 options call, 273, 274, 286-289 distribution reshaping, 423-429 fixed income, 433-434 option greeks, 429-433 put, 271, 286-289, 393 quantity-adjusting (quanto), 391-395 terminology, 270 and volatility, 273-276 volatility skews, 276-278 ordinary least squares (OLS), 155 Ornstein-Uhlenbeck process, 113, 116-119, 283 P-P (probability-probability) plots, 215 p-values, 147 par curves, 100-102 parameter estimation methods, 139 Bayes's Rule, 139-142 resampled efficient frontier, 151-154 shrinkage estimators, 142-147 statistical tests, 147-151 passive investors, 189 payer swap, 411 payoff (options), 271, 423-429 peaks over thresholds (POT) method, 240 Pearson correlation, 301-303 limitations, 303 peril-free arbitrage, 59 perils, 2 periodicity, 289 Perron-Frobenius Theorem, 75 personal preference risk, 6-9, 26-31 utility theory and wealth management, 32 physical settlement, 271, 383 Pickands Theorem, 239, 241 portfolio duration, 96 portfolio insurance, 39-42 positive assets, 132 possibility effect, 35 predictive power of default estimates, 368-371 price system, communication by, 11-12 price takers, 421 prices of risk, 195

More Information

616 Index

pricing error (arbitrage pricing theory), 195-198 pricing kernel, 69, 73 Principal Components Analysis (PCA), 200-209 prizes (VNM utility theory), see also reward, 26-31 probability density function (pdf), 17, 221, 229 probability distribution, 16, 211-220 probability mass function, 16 probability space, 15 probability terminology, 12-20 procyclical, 324 proposal distribution, 259 Prospect Theory, 35 protection buyer, 383 protection seller, 383 pseudo-inverse, 167 put-call parity, 359 put option, 271 distribution reshaping, 423-429 quantity-adjusting (quanto), 393 straddle, 273, 274 VIX*R calculations, 286-289 put spread, 425 put writer, 271

Q-Q (quantile-quantile) plots, 213–215, 235 quadratic optimization process, 126–131, 138 quantity-adjusting (quanto) options, 391–395 quasi-correlation matrix, 328 quasi debt-to-firm value ratio, 360

random variables, 16 rank functions Pearson correlation, 301-303 Spearman correlation, 303-305 rate of return, 69, 124 ratings agencies, see credit ratings ratings migration, 342 real rates, 82-84 real-world density recovery model, 280-282 real-world probability, 68 Ross Recovery Theorem, 72-80 receiver swap, 411, 415 recovery amount, 336 reduced-form credit models, 377-380 reference entity, 383 relationship modeling, see correlation relationships relative risk, 404 relative risk aversion, 30 representative utility-maximizing investor, 73 reserve fraction (banking), 407 return, 124 return relative, 69 reward equity modeling, 123 risk-adjusted reward measures, 50-53 risk preferences, 26-31 rising stars (bonds), 342 risk, see also hedging basic credit risk concepts, 335-337 Knightian, 4, 6, 9-12, 265-266 meaning and types of, 1-2 risky decisions examples, 6-9 stress testing and scenario analysis, 265-266 utility theory, 20-31 risk-adjusted reward measures, 50-53 risk-averse prices, 56-58 (risk-free) arbitrage, 59 srisk-free assets, 136 risk-free assets, 134 risk-free instruments, 68 risk-free rate, 83, 86-88 risk measurement, 37, 54 risk metrics, 37 risk-neutral density recovery model, 279-280 risk-neutral probabilities, 66-76 risk-on/risk-off regimes, 311, 315 risk preferences, 26-31 risk unbundling, 387-395 robo-investing Black-Litterman, 158 utility theory, 32 rolldown, 105-107 Ross Recovery Theorem, 72-80, 192, 280-282 run on the bank, 407-410 SABR volatility modeling, 284-285 sample space, 3-4, 15, 66-68 scalar marginal distributions, 316 scatter plots, 215 scenario analysis, 265-266 scree, 203 scree plots, 203-204 seasoned bond, 88 seasoned receiver swap, 415 Secured Overnight Financing Rate (SOFR), 335 securities, 13-14 factor models, 187-188, 191 state prices, 66, 76 security weights, 249 senior tranche, 319, 322 severity, 336

CAMBRIDGE

Cambridge University Press & Assessment 978-1-009-20904-5 — Quantitative Risk and Portfolio Management Kenneth J. Winston Index

More Information

Index

617

Shannon entropy, 142 shares, 13-14 Sharpe Ratio, 50, 137 Sharpe, William, 190 shocks (volatility modeling), 290, 298 short position (assets), 61 short rate curves, 103 short rate models expected value of Vasicek model, 119-120 general framework, 115-116 implied short rate, 114 other models, 121 specific framework, 116-119 short sales, 60-66 short squeezes, 63-66 short straddle, 426 short strangle, 427 short-term loans, 99-100 shrinkage estimators, 142-147 Siegel's Paradox, 397-402 sigma-algebra, 15 simulation, 244-245 delta-normal, 248-253 historical simulation, 245-248 Markov Chain Monte Carlo, 258-265 Monte Carlo, 253-258 skewness, 18 Jarque-Bera, 215 Sklar's Theorem, 317 Sortino Ratio, 52 sovereign debt ratings, 348-352 sovereign spreads, 352-354 Spearman correlation, 303-305 specific behavior (arbitrage pricing theory), 195-198 Spectral Decomposition Theorem, 166 spectral measures of risk, 47 speculative grade bonds, 340-342, 354-357 spot curves, 100-102 spot market, 388 spot rates, 109-111 spread, 336 stable distributions, 210, 226-230 standard deviation, 18 delta-normal, 250 historical volatility, 267-270 Modigliani and Modigliani (M²) measure, 52 Pearson correlation, 301-303 rate of return, 124 Sharpe Ratio, 50 Sortino Ratio, 52 volatility, 42-44, 273 state-price securities, 66

state prices, 66-68 statewise dominance, 19 stationary distribution, 258 stationary processes, 129 stationary time series, 290 statistical probability, 2, 38 stochastic discount factor (SDF), 69 Jackwerth and Menner's Method, 77-78 Ross Recovery Theorem, 72-80 Ross's Method, 76-77 stochastic discount factors, 68-72 stochastic process terminology, 111-114 stochastic volatility modeling, 282-283, 286-289 stock exchange, 14 stock market portfolio insurance, 39-42 wealth management and utility theory, 32 stocks, 13-14 straddle (market volatility), 273, 274, 426 strangle, 427 stress testing, 265-266 strike price, 270, 430 strong duality, 176 Student's T distribution, 220-221 swap rates, 410-413 swaptions market, 437 T-account statement, 406 tail distributions, see also fat-tailed distributions, 237-243 tent proposal distribution, 259 term structure models, 114 expected value of Vasicek model, 119-120 other short rate models, 121 short rate models - general framework, 115-116 short rate models - specific framework, 116-119 TGARCH model, 297-300 theta decay/bleed, see also delta-gamma-theta simulations, 430 time series estimates, 325-332 time series terminology, 289-293 time to default, 336 time-varying volatility, 267 ARCH and GARCH modeling, 293-296 historical, 267-270 market volatilities and volatility markets, 273-276 options and volatility, 270-273 volatility models, 278-289 volatility skews, 276-278

CAMBRIDGE

Cambridge University Press & Assessment 978-1-009-20904-5 — Quantitative Risk and Portfolio Management Kenneth J. Winston Index

More Information

618 Index

Treynor Ratio, 51 Trzcinka, Charles, 204 Two-Fund Separation Theorem, 128 Type I error, 369 Type II error, 369 unbundling risk, 387-395 uncertainty economics terminology, 9-12 Knightian, 2-6 (risk-free) arbitrage, 59 unconditional probability, 15 unconstrained convex optimization, 165-173 underlying entity (options), 270 unit root process, 291 utility functions, 22, 133-134 utility theory, 20-31 drawbacks, 32-36 von Neumann and Morgenstern (VNM) theory, 22-26 Value at Risk (VaR), 45-47 conditional (cVaR), 46 discrete distributions, 47-49 as non-coherent, 55 variance, 18 factor models, 200 Heston model, 283 implied correlations, 312-316 Levene's Test, 149 mixtures of normals, 223 Vasicek model, 119-120 expected value, 119-120 Markov assumption, 115-116 Ornstein-Uhlenbeck process, 116-119 other short rate models, 121 vega trading, 276 ventures, 2 VIX®, 274, 286-289 volatility, 18, 42-44 credit spread correlates, 371-372

implied correlations, 312-316 investment grade bonds, 356 and options, 270-273 volatility frown, 277 volatility models, 278-289 local, 283-284 real-world density recovery, 280-282 risk-neutral density recovery, 279-280 SABR, 284–285 stochastic, 282-283 VIX® calculations, 286-289 volatility skews, 276-278, 425 volatility smile, 277 von Neumann and Morgenstern (VNM) utility theory, 22-26 wealth management, 32 Weibull distribution, 232, 236, 242 white noise process, 111 wholesale prices, 81 yield, 90 vield curves, 97-98 economic conditions, 103-105 features, 99-100 interpolation and smoothing techniques, 107-109 movement that overwhelms a bank's spread, 407, 410-413 rolldown and key rate durations, 105-107 term structure models, 114 types of, 103 zero curves and par curves, 100-102 Yule-Walker equations, 291 Z-scores, 377-380

Z-scores, 377–380 zero cost collar, 428 zero-coupon bond, 88 zero curves, 100–102