

# Index

- 12b-1 fees, 28, 259
- 1987 stock market crash, 211
- 2007–2010 crisis, ix, 31, 41, 55, 62
- ABS, 23, 183, 259
- ABX index, 220
- Accounting
  - GAAP, 191
  - hedge, 191
- Adjustable rate mortgages (ARMs), 63
- ADR, 27, 259
- Adverse selection, 39
- Algorithmic trading systems, 52
- Alignment of interests, 46
- Alpha, 259
  - Jensen's, 269
- Altman's Z-score, 217
- Amaranth Advisors, 178
- American depository receipt (ADR), 27, 259
- American Insurance Group (AIG), 219
- Annualization, 157, 247–248
  - factor, 151, 158, 248
- Annuity, 180
- Approvals, 189
- Arbitrage, 83–84, 259
- Asset-backed security (ABS), 23, 183
- Asset
  - extrinsic value, 41
  - factor response, 70
  - intrinsic value, 1–2, 41, 54, 70
  - model, 51, 110
  - price, 18, 51, 54, 59
  - risks, 56
  - risky, 83–85, 97
  - valuation, 70
  - value, 51–52, 54, 56, 58–59
- At-issue criteria, 28–29
- Bachelier, Louis, 273
- Back-testing, 189, 260
- Backwardation, 198, 260
- Barclays Capital U.S. Government/Corporate Index, 211, 219
- Bars, 38
- Basis, 48, 194, 260
- Basis point, 260
  - dollar value of a, 21, 132, 265
  - present value of a, 132, 274
- Basis risk, 25, 48, 157, 208, 211, 222, 260
- Behavioral finance, 11, 56, 171, 260
- Benchmark, 35, 211, 260
- Beta, 110, 154–155, 158–159, 261
- Beta adjustment, 213
- Black box, 30, 104, 149, 261
- Black-Scholes formulae, 70
- Black-Scholes-Merton framework, 73,
  - 83–84, 100, 117
- Black-Scholes model, 201
- BofA Merrill Lynch High Yield Constrained Index, 219
- Bogey, 36, 261
- Bond
  - amortizing, 23, 259
  - asset-backed, 23
  - bullet, 23, 38, 82, 130, 132, 134–135, 261
  - callable, 25–26, 130, 133, 261
  - convertible, 24, 130, 213, 262
  - coupon bearing, 24
  - credit spread, 24
  - due diligence, 28
  - floating rate, 117
  - high grade, 130, 132
  - interest-only, 21
  - mortgage-backed, 27
  - plain vanilla, 24–26, 31, 274
  - puttable, 24, 130, 275
  - sinking fund, 23
  - zero-coupon, 21, 24, 71–72, 74, 128–129,
    - 280
- Bootstrapping, 76, 261
- Boundary conditions, 87

- Breaking the buck, 261  
British Bankers' Association (BBA), 77  
Bubble  
  dot-com, 2, 41  
  market, 20  
Bureau of Labor Statistics, 64  
Burnout, 221  
Business cycle, 2, 9–12  
  initial recovery, 9  
  late expansion, 9  
  recession, 9  
  slowdown, 9  
Busted convertible, 24, 261  
  
Calendar risk, 196  
Call  
  margin, 270  
  option, 33, 200, 261  
    covered, 33, 263  
    delta, 202  
    hedge ratio, 205  
    naked, 33, 272  
    on enterprise upside, 215  
    prepayment as, 62  
    volatility risk, 34  
  provision, 25  
  risk, 25, 44  
Cap, 261  
Capital asset pricing model (CAPM), 154, 250  
Capital gain, 19  
Caplet, 261  
Captive finance company, 44  
Cash collateral account, 23  
Cash flow  
  deterministic, 81  
  projecting, 80  
  waterfall, 28, 81, 261  
CBOE S&P 500 Implied Correlation Index, 146, 148  
CDO, 31, 38, 183, 261  
  synthetic, 38, 278  
CDS, 261  
  cash settlement, 218  
  physical settlement, 218  
CDX index, 220  
Central bank, 6  
Central limit theorem (CLT), 95, 97, 243  
  rapidity of convergence, 244  
Charm, 123, 261  
  
Cherry picking, 39  
Chevrolet Vega, 110  
Chicago Board Options Exchange (CBOE), 146  
Chicago Mercantile Exchange (CME), 47, 78  
Cholesky decomposition, 243  
Churches, 38  
Citron, Robert, 33  
Claim  
  contingent, 262  
Clearing house, 45  
CLO, 31, 261  
CMO, 27, 261  
  tranches, 27  
Coefficient of determination ( $R^2$ ), 60, 251–252, 262  
Collar, 262  
  zero cost, 280  
Collateralized debt obligation (CDO), 31, 38, 183, 262  
Collateralized loan obligation (CLO), 31, 262  
Collateralized mortgage obligation (CMO), 27, 262  
Collateral servicing, 28  
Color, 125, 262  
Commodity Futures Trading Commission, 43  
Commodity trading advisor, 43  
Comparative advantage, 175  
Confidence interval, 52  
Consumer price index, 5  
Contango, 199, 262  
Contingent claim, 87  
Continuous compounding, 262  
Convergence, 126  
Convexity, 117, 132, 152, 262  
  effective, 133  
  negative, 26  
  pass-through, 62–63  
  positive, 22, 26, 133  
  vega, 280  
Correlation, 55, 253–254  
  coefficient of, 98, 158–159, 253–254, 263  
  implied, 92  
Cost  
  market impact, 271  
  of carry, 194, 263  
  to close, 44, 263  
Council of economic advisors, 12

- Counterparty, 185
  - limits, 185
- Covariance, 96, 98, 100, 158, 263
- Covered call writing, 33
- CPI, 5
- Credit default
  - spread, xiii
  - swap (CDS), 40, 218, 263
- Credit
  - derivative, 218
  - enhancement, 28
  - event, 220, 263
  - rating, 185, 216, 263
    - issuer, 216
    - issuer-specific, 216
  - risk, 185
  - spread, 20
    - corporate, 20
- Cross-default provision, 220, 264
- CTA, 43
- Cuba, 39
- Cumulant, 91, 234–235, 264
- Cumulative distribution function (CDF), 90,
  - 93, 165–166, 232
- Currency peg, 182
- Curtailment, 264
- Curve
  - discount, 79, 81, 118, 126
    - zero-coupon, 128
  - Phillips, 5
  - spot rate, 72, 276
  - swap, 24
  - yield, 22, 35, 59
    - risk, 22
- Day count convention, 224
- Decay
  - delta, 264
  - time, 278
- Default
  - risk, 214
  - tables, 218
- Deflation, 5, 264
- Delinquency rate, 109
- Delta, 112–113, 201, 264
  - absolute, 113–114, 259
  - decay, 123
  - effective, 203, 265
  - hedging, 25, 48, 173, 210, 264
    - effective, 202, 204
    - modified, 203
    - neutral portfolio, 201, 264
  - relative, 113–116, 203, 275
  - riding, 204–205, 264
  - shadow, 203, 276
- Derivative, 264
  - credit, 263
  - interest rate, 112
  - mathematical, 111, 141
    - functional, 134
    - logarithmic, 114
    - partial, 112, 118, 131
    - secant, 203
    - total, 131
  - non-linear, 111
  - over-the-counter, 45
  - pricing, 187
  - time decay, 118
  - volatility, 116
- DgammaDvol, 264
- Disaster myopia, 176
- Discount curve, 79, 81, 118, 126
  - flat, 130
  - parallel shift, 118, 126–127, 129, 131, 133
  - sensitivity, 137
  - shape, 133
  - zero-coupon, 128
- Discounted cash flows (DCF), 54, 70–71, 74,
  - 127–128, 265
- Discount rate, 7–8, 265
- Discount window, 7
- Distribution, 254
  - binomial, 254
  - Gaussian, 239
  - leptokurtic, 236
  - Levy, 94–95, 97, 100, 153, 164, 168–169
  - limit, 97
  - log-normal, 87, 94, 239–240
  - multivariate, 241–242
    - normal, 243
  - normal, 90–91, 96–97, 236, 239
  - platykurtic, 236
  - Poisson, 100, 231, 240, 272
  - Student's  $t$ , 254
  - tails, 89
  - unimodal, 238
- Diversification, 37, 184, 193, 265
- Diversifier, 54
- Dividend income, 19
- Dollar value of a basis point, 21

- Dot-com bubble, 265
- Down-and-in, 265
- Down-and-out, 265
- Drawdown, 155, 157, 162, 265
  - maximum, 157
  - recovery period, 155
  - return over maximum, 275
- Duration, 117, 126–127, 129–130, 132, 152, 265
  - and hedging, 205
  - bond, 20
  - effective, 21, 129–133, 203, 266
  - key-rate, 22, 117, 126, 133, 269
  - Macaulay, 127–129, 270
  - Macaulay-Weil, 128
  - mismatch, 22
  - modified, 20, 127–129, 131–132, 271
  - negative, 21, 29, 131
  - neutrality, 133
  - pass-through, 62–63
  - spread, 21
  - true, 128
- DV01, 21, 132, 224, 265
- DvegaDttime, 124, 265
- DvolgaDvol, 126, 265
- Dynamic hedging, 200, 212
- Early expansion, 9
- Economic indicators, 265
  - ADP employment report, 13
  - car sales, 13
  - consumer confidence, 13
  - durable goods orders, 13
  - EIA petroleum status report, 13
  - employment situation report, 13
  - manufacturing index, 13
  - pending home sales, 13
- Economic report of the president, 12
- Economic value, 51–52, 54
- Efficient markets, 11
- Elasticity, 67–68, 110, 116, 266
- Embedded derivatives, 192
- Endowment funds, 32
- Energy futures, 194
- Enron, 215
- Equivalent variation investment (EVI), 115, 139, 206, 266
  - and dynamic hedging, 210
  - and factor sensitivities, 103
  - and hedge notional, 48
  - and hedge sizing, 160
  - and quantifying risk, xv
  - and relative delta, 115
  - effective, 203, 213
  - uncertainties, 115
- ERISA, 174
- Error
  - amplification, 67–68, 125, 139
  - data flow, 65–66
  - function, 70, 266
  - implementational, 66–61, 70
  - numerical, 67–69, 93
  - operational, 43
  - programming, 66
  - roundoff, 67
  - simulation, 68
  - statistical, 70
  - tracking, 53, 157, 211
  - truncation, 67
- ETF, 25, 33, 43
- Euro STOXX 50 Index, 105–107, 109, 121, 140
- Excess spread, 29
- Exchange-traded funds (ETFs), 25, 33, 43
- Execution, 189
- Expected loss, 217
- Expected tail loss (ETL), 164, 167–169, 266
- Expected value, 85, 233–235, 243
- Expiration price, 187
- Exposure hedge ratio, 186, 206
- Factor return, 92
- Factors of production, 54
- Factor universe, 80–82, 87, 100
  - path, 81–82
  - probability, 81
  - realization, 80–82, 87
- Failed trade, 45
- Fair value, 30
- Fannie Mae (FNMA), 63
- FAS 115, 191
- FAS 133, 191
- FAS 157, 30
- FAS 87, 211
- FASB, 30, 211
- Federal funds, 7
  - rate, 7
  - target, 7
- Federal Home Loan Banks (FHLB), 63

- Federal Open Market Committee, 7, 61, 147, 267
- Federal Reserve Act, 7
- Federal Reserve System, the, 7
- Fed, the, 7
- Financial Accounting Standard (FAS), 267
- Financial Accounting Standards Board, 30, 211
- Financial asset, 19
- Financial crisis of 2007–10, ix, 55, 62
- Financial distress
  - cost of, 174
- Financial instrument, 19
  - price, 1–2, 18, 51, 54, 59
  - value, 1, 10, 18–19, 30, 51
- Fisher, Irving, 4
- Flight to quality, 24, 184, 215
- Floor, 267
- FOMC, 7, 147, 267
- Forced buy, 52
- Forced liquidation, 184
- Forced sale, 52
- Forward rate agreement (FRA), 78
- Foundations
  - charitable, 32
- Fraud, 43
- Freddie Mac (FHLMC), 63
- Free float, 36
- Frequency
  - of compounding, 128
  - of data observations, 64, 98–99, 151
  - of outcomes, 164, 227–229
  - of rebalancing, 202
- Frictional losses, 54, 84, 203, 205
- Fund
  - actively managed, 33
  - exchange-traded, 25, 33, 43
  - index, 53
- Futures
  - contract, 47, 112, 267
  - heating oil, 194
- Gain on sale, 215
- Gamma, 119, 121, 123, 138, 202, 267
  - climbing, 204, 267
  - contribution to effective delta, 203
  - diagonal, 122, 140
  - hedging, 122, 202
  - negative, 49
  - neutral strategy, 202, 206
  - numerical accuracy, 139
  - of an option, 48, 122, 224
  - positive, 122, 210
  - versus time decay, 119
  - volatility, 280
- Gate provision, 35, 268
- Gaussian, 96–97, 100, 164
- GDP, 9, 12
  - deflator, 13
- Ginnie Mae (GNMA), 63
- GNP, 9
- Government-sponsored enterprise (GSE), 62–63
  - charter, 63
- Greater fool theory, 20, 268
- Great Recession, the, ix
- Greeks, the, 110, 268
  - and interest rate sensitivities, 127
  - linear, 112
  - second order, 123
- Gross domestic product, 9
- Gross national product, 9
- Haircut, 268
- Half-life, 64, 98
- Headline risk, 45
- Hedge, 115
  - cross, 182, 264
  - delta, 264
  - equity futures, 206
  - execution, 223
  - funded, 209, 267
  - funds, 212
  - gamma, 267
  - imperfect, 208
  - layering, 213
  - linear, 210, 223
  - long, 270
  - natural, 272
  - non-linear, 47, 210, 223
  - proxy, 206, 221, 274
  - ratio, 186, 205
  - reasons to, 173
  - short, 276
  - sizing, 160, 162
    - optimal, 160, 162
  - stack and roll, 277
  - static, 277
  - strategy, 187
  - strip, 277

- Hedge (*Continued*)  
tenor, 223  
theta, 119  
unfunded, 209, 279
- Hedging, 47, 119, 146  
dynamic, 265  
first rule of, 173  
justification for, 176  
opportunity cost, 33  
second rule of, 184  
third rule of, 207  
time zone differences, 224  
unintended consequences, 213
- Historical regression, 64  
Historical test, 93–94  
Hunt brothers, 178
- Index  
custom liability, 211  
futures, 182
- Indicators  
economic, 11
- Inflation, 4, 12, 268  
and unemployment, 5
- Information asymmetry, 46, 173, 215
- Initial conditions, 87
- Instrument  
linear, 270  
nonlinear, 272  
over-the-counter, 273
- Insurance  
bond, 261  
portfolio, 274
- Insurer  
monoline, 272
- Intercontinental Exchange (ICE), 47
- Interest only security (IO), 21, 29, 131
- Interest rate  
cap, 34, 269  
collar, 269  
floor, 269  
nominal, 4  
real, 4  
term structure, 117, 127  
volatility, 34, 77, 79, 117
- In-the-money, 268
- Investment  
objectives, 35  
portfolio, 87–88  
risk-free, 25, 72–73, 179
- Investor  
buy-and-hold, 41  
psychology, 52  
short-term, 41
- IO, 21, 29, 269  
ISDA, 186, 220, 263  
iTraxx index, 220
- Jump-diffusion process, 100, 117, 240, 269
- Key maturity, 133–137  
Keynes, John Maynard, 42  
Key rate, 22, 134, 136, 142  
convexity, 134–135  
off-diagonal, 135  
decoupling, 135  
deformation, 136  
duration, 134–135  
DV01, 134  
measures, 126, 133–135  
PV01, 134  
KMV Creditor Monitor, 217  
Knock-out option, 30, 187  
Kurosis, 81, 91, 235–236
- Lambda, 116, 269
- Law  
of demand, 3  
of large numbers, 11  
of one price, 201  
of supply, 3
- Leading indicators, 10  
Lehman Brothers, 72  
Lender of last resort, 7  
Letter of credit, 180, 215, 269  
Leverage, 184
- Levy  
distribution, 94–95, 97, 100, 153, 164,  
168–169  
flight, 94  
Paul Pierre, 94  
process, 94, 100, 269
- Liar loans, 215
- Libor, 64, 77, 270  
curve, 78  
swap curve, 78  
swap rates, 64, 78
- Limit  
counterparty, 263  
exposure, 181, 266

- notional, 181, 273
- stop-loss, 181
- Liquidity, 224
  - crisis of 2007–2010, 31
  - premium, 37, 75, 183, 218
- Loan covenant, 173
- Loan-to-value ratio (LTV), 63
- Log-normal distribution, 87, 94
- Long Term Capital Management, 184
- Loss
  - given default, 23, 218, 270
  - given default (LGD), 217
  - mitigation, 215
  - severity, 23
- LYON, 24, 270
- Lyra, constellation of, 110
- Macaulay, Frederick R., 128
- Managed futures fund, 43
- Margin, 185
  - call, 32, 197, 224, 271
  - initial, 196, 268
  - maintenance, 197, 271
  - variation, 197, 279
- Market
  - clearing price, 3
  - discount, 2
  - exposure, ix, xvi, 49, 103, 110, 115, 271
  - factor, 204
    - co-movement, 109
    - sensitivity, 55, 149
  - impact, 31
    - cost, 32
  - maker, 271
  - mark-to-, 271
  - premium, 2
  - sentiment, 99
  - spot, 277
- Markowitz, Harry, 37, 273
- Mark-to-market, 30, 271
  - timing differences, 224
- Matrix
  - pricing, 1, 271
  - response, 275
- MBS, 25, 27, 31, 45, 271
- Mean, 81, 235, 237
- Measures
  - central tendency, 237
  - tail risk, 278
- Median, 81, 238
- Median tail loss (MTL), 164, 167–169, 271
- Merton model, 217
- Metallgesellschaft, 197
- Mispricing, 52
- Mode, 238–239
- Model, 51
  - accuracy, 59, 69, 86
  - numerical, 69
    - saturation, 93
  - behavioral considerations, 56
  - Black-Scholes, 261
  - capital asset pricing, 261
  - complete, 142
  - concept, 56
  - data checkers, 61
  - error amplification, 67, 125
  - factor, 56, 59, 86, 103, 108, 149
    - complete set, 60
    - continuous, 71, 80, 84–85, 91, 103–104
    - discrete, 71, 80–81, 84–86, 91, 104
    - economic, 56, 59, 62
    - external, 64, 70
    - instrument, 115
    - interdependent, 60
    - macroeconomic, 64
    - market, 56, 59, 71, 92, 103–104, 110, 115, 117, 119
    - non-market, 39, 71, 84–85, 91–92, 104, 110
    - qualitative, 57, 64–65
    - quantifying, 56
    - quantitative, 56–57
    - variability, 86
  - financial, 55
  - formalism, 57, 61
  - frugality, 59
  - future projections, 57, 64
  - implementation, 52, 58–61, 65
  - inputs, 56–60
    - delayed, 61
    - subjective, 57, 61
  - political considerations, 56
  - prepayment, 58, 222
  - quantitative, 55–56
  - regressions, 57, 64
    - data frequency, 64, 98–99
    - equal-weighted, 64
    - historical decay, 64
    - historical window, 64

- Model (*Continued*)  
least squares, 64  
robust, 64  
risk, 65, 69  
sensitivity, 69  
statistical errors, 69  
test, 58  
uncertainty, 66, 132, 138–139  
conceptual, 66, 115  
formalism, 66, 115  
implementational, 66  
numerical, 67  
unstable, 59  
valuation, 55–56, 67, 70, 103–104, 132, 137, 139, 149
- Modern portfolio theory (MPT), 37, 171
- Moment, 271
- Monetary policy, 6–7, 271
- Money, 272
- Money  
quantity theory of, 4  
supply, 4
- Monitoring, 190
- Monoline insurance company, 183
- Monte Carlo method, 64, 88, 91, 94, 166, 272  
analytical, 92  
asset-backed securities valuation, 88  
basic theorem, 89  
derivatives valuation, 70  
historical, 92–93  
hybrid, 92  
limitations, 89, 91  
random number generator, 68  
variance reduction techniques, 69
- Moral hazard, 176
- Mortgage  
adjustable-rate (ARM), 63
- Mortgage-backed security (MBS), 21, 25, 60, 130  
conforming loan limit, 63, 65  
curtailment, 62  
delinquency rate, 62–63, 109  
foreclosure rate, 62–63  
geographic concentration, 38, 62  
pass-through, 61  
prepayment, 62  
model, 65  
speed, 60, 62–63, 109  
refinancing, 62
- Mortgage Bankers Association of America (MBAA), 62
- Mortgage  
call provision, 25  
call risk, 44  
curtailment, 264  
fixed-rate, 62  
Florida, 63  
hedging with balance guarantee swap, 260  
liar loans, 215  
originator, 54  
pass-through, 27, 65  
pool, 62, 65  
prepayment, 28, 221  
risk, 221, 274  
speed, 109, 274  
private insurance, 215  
savings and loans crisis, role in, 23  
subprime, 24, 216, 277  
hedge, 220  
willful default, 220
- MPT, 171
- MSCI Far East Index, 160
- Multicollinearity, 60, 272
- Naked call writing, 33
- NASDAQ 100 Index, 113–115, 208
- Natural gas, 11  
futures, 178
- Natural hedge, 180
- Nelson-Siegel function, 79
- Net asset value (NAV), 46, 209
- NIKKEI 225 Index, 160, 224
- Normal distribution, 90–91, 96–97, 236, 239
- Notional, 273  
futures, 48  
option, 48
- Null hypothesis, 253–254
- Offering memorandum, 216
- Office  
back, 260  
front, 267  
middle, 271
- Off-the-run, 273
- Oil, 11  
hedging, 182–183, 198, 200  
basis risk, 213  
industry nationalization, 39

- market, 177
- price, 19, 42, 44, 175
- reserves, 42
  - proven, 42
  - unproven, 42
- resources, 42
- supply and demand for, 13
- Omega, 116, 273
- One way markets, 188
- On-the-run, 273
- Open interest, 273
- Open market operations, 6–7, 273
- Opportunity cost, 49, 208
- Optimal strategy, 186
- Option, 125, 273
  - American, 87–88, 187, 259
  - Asian, 88, 187, 259
  - at-the-money, 120, 260
  - barrier, 214, 260
  - Bermudan, 88, 187, 261
  - call, 118–120, 200, 261
    - delta, 202
    - hedge ratio, 205
    - naked, 272
  - compound, 262
  - credit spread, 219, 264
  - delta, 202
  - down-and-out, 187
  - European, 70, 87–88, 118, 187, 266
  - exchange-traded, 187
  - exercise style, 187
  - exotic, 266
  - Greeks, 224
  - index, 117
  - interest rate, 113, 117
  - in-the-money, 44, 118
  - knock-in, 269
  - knock-out, 30, 269
  - listed, 45, 270
  - look-back, 88, 188, 270
    - call, 188
    - fixed strike, 188
    - floating strike, 188
    - put, 188
  - naked, 272
  - OTC, 187
  - out-of-the-money, 44, 273
  - path-dependent, 273
  - plain vanilla, 60, 83, 89, 100, 117–118, 122, 201
  - put, 48, 118, 209, 275
  - shout, 188
  - stock, 113, 117–118, 120
  - up-and-in, 279
  - up-and-out, 279
  - variance, 112–113, 116–117
  - volatility risk, 34
- Orange County, 33
- Order
  - stop, 45
  - stop-limit, 45
- Originate to distribute, 216
- OTC, 45, 273
- Outlier, 61, 163, 238
- Out-of-the-money option, 273
- Output gap, 9
- Over-collateralization, 25
- Overhedged portfolio, 196, 208
- Over-the-counter, 273
- Paper trading, 189
- Par coupon curve, 76
- Partial differential equations, 86
- Pass-through, 61
  - convexity, 62–63
  - duration, 62–63
- Path dependence, 87–88, 187
- Pension accounting, 211
- Performance attribution, 56, 139
  - interest rate, 142
  - linear, 140
  - quadratic, 140
  - second order, 142
- Performance triggers, 28
- Perrier, 45
- Personal guarantee, 215
- Phillips Curve, 5
- Places of contemplation, 38
- PO, 29, 274
- Porsche SE, 44, 52
- Portfolio
  - insurance, 210
  - risk-free, 83–84
- Position
  - long, 270
  - short, 276
- Pre-averaging approximation, 82, 85–86
  - partial, 82, 86
- Pre-hedging, 190

- Premium  
bond insurance, 183  
credit default swap, 40, 263  
inflation, 4  
interest rate cap, 34  
liquidity, 37, 75, 183, 218  
market, 2  
market risk, 271  
option, 33, 47–48, 122, 186  
risk, 83, 85, 152, 155, 175, 184, 261  
swaption, 34
- Prepayment, 21, 29, 62, 130  
model, 58, 65  
rate, 64–65, 190  
speed, 60, 62–63, 66, 88, 109, 274
- Present value, 54, 71–72
- Price  
ask, 1, 51, 259  
bid, 1, 51, 261  
ex ante, 36  
exercise, 266  
ex post, 36  
inefficiency, 183  
market, 53  
obscurity, 223  
observed, 52–53  
offer, 51  
settlement, 197  
stop, 45  
strike, 277  
trade, 52
- Primary dealer, 8, 274
- Principal only (PO), 29
- Private mortgage insurance (PMI), 215
- Probability, 227–229, 235, 239  
conditional, 228  
density, 232, 238–239, 241, 243, 272  
joint, 241  
distribution function, 81, 229–231  
continuous, 232  
cumulants, 91, 234–235, 264  
discrete, 231  
moments, 234, 236  
*a priori*, 228  
of default, 217
- Process  
deterministic, 228  
jump-diffusion, 100, 117, 240, 269  
Lévy, 94, 100, 269  
stochastic, 83, 270
- Profit-or-loss (P/L), 48, 139–142  
report, 190
- Progressive tax scale, 173
- Protective puts, 33
- Proxy hedging, 205
- Prudent expert rule, 174
- Put spread, 30
- PV01, 117, 126, 132, 275
- P-Value, 146, 253–254
- Quantile, 81
- Random  
innovation, 86  
number, 69, 92–93, 96  
generator, 69, 93  
phenomena, 227  
variable, 90, 93, 95–96, 266  
continuous, 232  
discrete, 231
- Rate  
delinquency, 264  
discount, 74, 79, 117  
discount (central bank), 7–8  
floating, 21, 267  
foreclosure, 267  
forward, 117, 267  
agreement, 78  
nominal, 272  
of return  
expected, 117  
required, 83–84, 117, 172  
real, 275  
reference, 74–75, 79, 135–136, 275  
risk-free, 55, 73–74, 83–84  
and rho, 117–118  
and risky assets, 85, 97  
and scenario grid, 107  
and semideviation, 152  
and Sharpe ratio, 153  
negative, 72
- Rating  
agencies, 28  
through the cycle, 218
- Ratio  
exposure hedge, 186, 206, 266  
hedge, 207, 268

- interest coverage, xiii
- price-to-earnings, 46
- Sharpe, 55, 153, 276
- Sortino, 55, 154, 276
- Treynor, 55, 154, 279
- volatility, 158, 160–161, 280
- Refinancing incentive, 221
- Regressand, 248
- Regression
  - linear, 109, 248–249, 270
    - dependent variable, 248
    - independent variable, 248
    - multivariate constrained, 251
    - multivariate unconstrained, 251
    - ordinary least squares (OLS), 249
    - univariate, 250
  - robust, 64, 249
- Regressor, 248
- Regulatory risk, 45
- Replicated portfolio, 206
- Repo, 8, 275
- Repurchase agreement, 8, 275
  - reverse, 8
- Reserve Management Corporation, 73
- Response, 103
  - asymmetric, 26, 122
  - linear, 67
  - matrix, 104–106, 149
    - and stress-testing, 109
    - synchronized, 108–109
  - measure, 104
  - non-additivity, 105
  - non-linearity, 119
- Return
  - absolute, 35
  - alpha, 35
  - arithmetic, 94, 114
  - beta, 35
  - continuously compounded, 94
  - expected, 266
  - idiosyncratic, 160
  - logarithmic, 94, 114
    - and central limit theorem, 95
    - and Monte Carlo method, 94
    - and semivariance, 153
    - and volatility, 116, 151
  - in liquid markets, 96
  - over maximum drawdown (RoMaD), 157
  - price, 114
  - risk-adjusted, 54, 275
  - risk-free, 72, 74, 85, 171
  - risky, 85
  - selection, 35, 276
  - style, 35, 277
  - systematic, 160
  - target, 153
  - total, 278
- Rho, 117–119, 126, 275
  - and hedging, 205
- Richardson extrapolation, 139
- Risk, 44, 145
- Risk-adjusted return, 54
- Risk
  - basis, 25, 48, 157, 211, 260
    - and cross hedge, 182
    - and hedging decision, 49, 115
  - benchmark, 36, 260
  - call, 25
  - commodity, 43, 262
  - compliance, 43, 262
  - concentration, 29
  - conservation of, 177
  - contagion, 27, 146, 262
  - contraction, 62
  - correlation, 37, 263
  - counterparty, 44, 184, 223, 263
  - country, 39, 263
  - credit, xv, 23, 128, 134, 214, 264
  - credit spread, 219
  - definition, 17
  - derivatives, 32, 264
  - diversifier, 54
  - downgrade, 214, 218
  - earnings, 265
  - earnings-at, 265
  - equity, 19, 266
  - exchange, 45, 266
  - exposures, 179, 181–182
    - identifying, 179
  - extension, 28, 62, 266
  - foreign exchange, 27, 73, 267
  - FX, 267
  - headline, 268
  - human behavior, 45, 221, 268
  - idiosyncratic, 154, 268
  - inflation, 37, 73, 268
  - insurance, 27, 268
  - interest rate, 20, 117, 190, 224, 269

- Risk (*Continued*)  
key man, 46  
legal, 43, 269  
legislative, 41, 269  
limits, 181  
liquidity, 31, 36, 45, 48, 184, 270  
longevity, 180, 270  
management, ix–x, xvii, 42, 56, 59, 96, 145  
manager, 34, 181, 271  
market, 148, 184, 271  
market sentiment, 31, 41, 271  
measure, ix  
absolute, 150  
bulge, 163–164  
extreme, 155, 162  
extrinsic, 149  
intrinsic, 149  
relative, 149, 157  
robust, 155, 162  
standard, 149  
tail, 150, 162–163  
model, 28, 30, 65, 69, 150, 201, 271  
sensitivity, 69  
mortality, 180  
nonsystematic, 19, 272  
operational, 43, 221, 273  
people, 43  
political, 39, 56, 63, 73, 274  
portfolio, 44, 145  
potential, 44  
premium, 83, 85, 152, 155, 175, 184, 261  
prepayment, 28, 221, 274  
redemption, 32, 221, 275  
regulatory, 275  
reinvestment, 24, 73, 221, 275  
reporting system, 225  
reversal, 224, 275  
skew, 164  
sovereign, 39, 73, 276  
specific, 19, 276  
spread, 214, 218, 277  
structure, 27, 277  
systematic, 19, 154, 278  
tail, 96–97, 166  
measures, 91, 150, 162–163  
triad, ix, 103, 275  
uninsurable, 223  
unsystematic, 37, 154  
valuation, 46, 279  
volatility, 34, 213, 280  
willingness and ability to take, 175, 208  
yield curve, 22  
RoMaD, 157, 162, 275  
Roundoff error, 67  
R-squared, 60, 251–252, 275  
Rule  
prudent expert, 274  
Russell 1000 Index, 26, 66, 69  
Russell 2000 Index, 47–48  
Russell 3000 Index, 53, 69  
Russian debt crisis, 39  
Sample history, 212  
Savings and loans crisis, 23  
Scenario, 64, 104, 108–109  
analysis, 149  
grid, 105, 107–108, 149, 276  
and effective delta, 203  
and stress-testing, 109  
selection, 108  
Scholes, Myron, 110  
Seagram Company, the, 215  
Secondary market, 30  
Securities lending, 47  
Securitization, 215  
Security  
asset-backed, xvi, 23, 27–28, 118, 130, 183, 259  
exotic, 31  
available-for-sale, 260  
hold-to-maturity, 268  
mortgage-backed, 21, 25, 27, 272  
mutual fund fee-backed, 45  
trading maturity, 279  
Semideviation, 152, 276  
target, 153  
Semi-invariant, 91, 234  
Semivariance, 152, 276  
target, 153, 278  
Sensitivity, 48, 103–104, 110–113  
and performance attribution, 139  
and Taylor theorem, 112  
cross, 121  
error, 67  
first order, 138, 140  
higher order, 124, 139–140, 204  
interest rate, 117–118, 126–127, 142  
linear, 110–112, 119, 132  
catalog, 112

- numerical evaluation of, 137
- price, 112
- second order, 119, 132, 138, 140
  - catalog, 123
  - symmetry of, 121
- third order, 125
  - catalog, 125
  - volatility, 110, 116
- Settlement, 276
- Severity of loss (SOL), 217
- Severity scale, 222
- Shadow gamma, 204
- Sharpe ratio, 55, 153, 276
- Short sale, 32, 115, 276
- Short squeeze, 32, 44, 52, 276
- Skewness, 81, 91, 235
- S&L crisis, 23
- Smallness criterion, 123
- Sortino ratio, 55, 154, 276
- Speculator, 177
- Speed, 125, 138, 203, 276
- Spline, 79
  - cubic, 79
  - higher order, 79
  - quartic, 79
- Split ratings, 217
- S&P 500 Index, 25, 35, 38, 64, 66–67, 69, 105–107, 109, 121, 140, 146–148, 206, 208, 211–212
- S&P 500 Telecommunication Services Index, 113–116
- S&P 500 Total Return Index, 146, 148
- Spot rate curve, 72, 76
  - theoretical, 75
- Spread
  - arbitrage, 259
  - bid-ask, 223, 261
  - bid-offer, 261
  - crack, 177
  - credit, 264
  - credit default, 263
  - relative value, 275
  - risk, 218
- Stack and roll hedge, 198
- Stack hedging, 198
- Standard deviation, 18, 81, 89, 96, 116, 150, 277
- Statement of Financial Accounting Standard (SFAS), 277
- Static hedging, 200
- Static pool analysis, 215, 277
- Statistical significance, 146, 229, 249, 253–254
  - test, 247, 253
- Statistics, 1–2, 11, 229, 247, 249, 253
- Stochastic
  - asset valuation, 82
  - differential equations, 86
  - extrapolation, 100, 150
  - innovations, 87
- Stop price, 45
- Stress-testing, 108–109, 149, 181, 277
- Strip hedge, 198
- Strip
  - interest-only, 269
  - principal-only, 274
- STRIPS, 75–76, 277
- Structured
  - note, 29, 31, 277
  - product, 29–30, 192, 277
- Style analysis, 206–207, 212, 277
- Sub-prime mortgages, 24
- Supply and demand, 3, 19, 52
- Surface
  - volatility, 280
- Svensson function, 79
- Swap, 278
  - amortizing, 259
  - balance guarantee, 190, 260
  - basis, 260
  - basket, 260
  - credit default (CDS), 38, 218
  - cross-currency, 223, 264
  - equity, 266
  - FX, 223
  - interest rate, 44
  - interest-rate, 177
  - interest rate, 269
  - off-market, 223, 273
  - puttable, 275
- Swaption, 34
- Swap
  - total return, 219, 278
  - variance, 116–117, 224
- Tail
  - probability distribution, 168–169
  - risk, 96–97, 162
    - measures, 91, 150, 162–163

- Target  
  semideviation, 153  
  semivariance, 153
- Tax rate, 173
- Taylor  
  expansion, 112, 121, 125  
  rule, 8  
  theorem, 112
- Technical analysis, 11
- Technical default, 220
- Test  
  completeness, 60, 139, 142–143  
  ex post, 59  
  extreme value, 58–59, 66  
  historical, 59, 93–94  
  in-sample, 59  
  out-of-sample, 59  
  self-consistency, 59, 141  
  stress, 108–109, 149, 181
- Theta, 118–119, 278  
  alternative definition, 119  
  and delta riding, 204  
  and hedging, 205, 214, 224  
  break-even move, 119  
  inability to hedge, 119  
  positive, 118
- Time decay, 118–119, 204, 214
- Time value of money, 71–72, 80
- TIPS, 37
- Too big to fail, 176
- Total return, 24
- Tracking error, 53, 157, 211, 278
- Trade ticket, 225
- Tranche, 279
- Transaction costs, 36, 54, 84, 122, 202, 204, 210
- Transition matrix, 217, 279
- Tree  
  binomial, 87  
  multinomial, 87–88  
  non-recombinant, 88  
  recombinant, 88  
  trinomial, 87
- Treynor ratio, 55, 154, 279
- True sale, 216
- Truncation error, 67
- t*-Statistic, 254
- Ultima, 126, 279
- Underhedged portfolio, 196
- Unemployment, 5–7, 12–13, 62–63, 71, 109  
  and inflation, 5  
  rate, 5, 8, 11, 60, 64, 84
- Upsilon, 116, 124, 279
- Utility function, 55, 279
- Valuation  
  risk-neutral, 83–85, 93, 117  
  single-path, 64, 81–82, 85
- Value added, 54
- Value at risk, 18, 91, 164–167, 179, 279  
  confidence level, 164  
  time horizon, 164
- Value  
  expected, 266  
  fair, 267
- Vanna, 124, 279
- VaR, 18, 91, 164, 167–168, 179, 279
- Variance, 91, 150, 235, 279  
  annualized, 248  
  -covariance matrix, 96–98  
  of variance, 117  
  vega, 279
- Vega, 110, 116, 123, 213, 280  
  and hedging, 205  
  Chevrolet, 110  
  star, 110  
  variance, 116, 124
- Venezuela, 39
- View of the market, 35
- Volatility, 150, 247, 280  
  and delta riding, 204  
  and response matrix, 105, 109  
  and robust regression, 64  
  and scenario grid, 107  
  and Sharpe ratio, 55  
  effect on asset valuation, 108  
  factor, 82  
  historical, 34, 268  
  implied, 34, 60, 92, 99, 268  
  inflation rate, 6  
  in stochastic extrapolation, 101  
  interest rate, 34, 79, 152  
  map, 203  
  market, 19, 31, 36, 45  
  P/L, 48–49  
  portfolio, 54  
  ratio, 158, 160–161

- risk, 34
- sensitivity, 116
- surface, 214
- swap, 213
- Volga, 124, 280
- Volkswagen, 44, 52
- Vomma, 124, 280
  
- Waterfall, 280
  - cash flow 261
- Weighted average coupon (WAC), 61, 63
  
- Weighted average time to maturity (WAM), 62–63
- Window dressing, 73, 280
  
- Yield curve, 22, 35, 59
  - shape, 22, 133
- Yield to maturity (YTM), 21, 128, 132
  
- Zero-cost collar, 224
- Zero-sum game, 219
- Zomma, 126, 280

<http://www.pbookshop.com>

<http://www.pbookshop.com>

<http://www.pbookshop.com>

<http://www.pbookshop.com>

<http://www.pbookshop.com>

<http://www.pbookshop.com>