

Index

- Abstraction, 14
- Advanced trading strategies with SAPE
 - Black-Scholes model, 290–292
 - large cap hedge strategy, 219
 - large cap long only strategy, 217–219
 - long short strategy, 219–221
 - potential assets under management, 219
 - summary, 221
- Algorithms (algos)
 - computer algo development, 248–256
 - computer algos for finding, 61–63
 - demonstration of loss aversion in option pricing, 57–59
 - Java programming, algo
 - jump-starting with, 266–273
 - PHP programming for algo development, 256–266
 - and portfolio management with SAPE, 222
 - for sentiment asset pricing engine (SAPE), effectiveness of, 190–191
 - technology infrastructure for algo creation, 245–277
- Algorithms (algos) creation for
 - high-frequency trading
 - efficient portfolio frontier, 294–296
 - flex user interface, 286–290
 - Monte Carlo simulation, 293–294
 - net present value (NPV) calculation, 284–286
 - probability from z scores, 279–281
- Sharpe ratio, 282–284
- signal detection theory (SDT), 296–298
- volatility calculation with ARCH
 - formula, 292–293
- z scores from probability, 281–282
- summary, 298
- Alternative investment tools of macro
 - investor sentiment
 - about, 194–197
 - development process, 197–198
 - web system contributions, 199
 - web system functions, 199
- American options, 231–232
- Anchor competition, 162–164
- Anchor competition study, 166–169
 - conclusion, 169
 - design, 167
 - discussion and analysis, 168
 - participants, 166–167
 - results, 167–168
- Anchor prices and double log law, 177–178
- Anchoring. *See also* arbitrary
 - anchoring effect; arbitrary
 - anchoring on inertia equity study and uncertainty, 71–72
 - of the value of endowment effect, 155–156
- Anchoring effect limits, 155–156
- Anchoring effects, 154–155
- Anchoring price and the locus effect, 48
- Arbitrage and hedging strategy
 - evaluation, 212–213

- Arbitrary anchoring effect
 - boundaries of, 176–177
 - robustness of, 176
- Arbitrary anchoring on inertia equity study
 - conclusion, 166
 - design, 164–165
 - discussion and analysis, 165–166
 - participants, 164
 - results, 165
- Arrays
 - converting an arraylist, 273
 - element deletion, 262
 - extreme values, 264
 - iterating, 262
 - merging, 263
 - searching, 263
 - into strings, 263
 - using, 261
- Arrays and arraylist data storage, 273
- Base conversion, 260
- Basic strategy, 215
- Bayesian theorem, new growth
 - function, 124–125
- Behavioral economics models on fund switching and reference prices
 - arbitrary anchoring on inertia equity, 164–166
 - behavioral factors that affect fund switching, 152–153
 - inertia equity, theory and production, 157–164
 - Visual Funds* for fund switching, 151–152
 - summary, 179
- Behavioral economics models on loss
 - aversion, 41–55
 - anchoring price and the locus effect, 48
 - assumption study, 51–53
 - future research, 54–55
 - locus effect on inertia equity study, 49–51
 - self-other asymmetry and loss aversion, 45–46
 - theoretical implications, 53–54
 - theory and hypothesis, 45–48
 - summary, 55
- Behavioral factors that affect fund switching
 - about, 152–153
 - anchoring effect limits, 155–156
 - anchoring effects, 154–155
 - anchoring the value of endowment effect, 155–156
 - endowment effect, 153–154
- Black-Scholes model, 15, 65, 85, 186, 238–239, 290–292
- Brand switching, 153, 175–176
- Breakeven analysis, 216–217
- C++ programming, 273
- Call options, 58–60, 186, 232–236, 238.
 - See also* American options;
 - European options
- Choice reversal, 70
- CLV equation and CE equation of RLZ model, 120–121
- Computer algo development, 248–256
- Java, appearance of, 253–254
- Java, object-oriented features of, 250–252
- PHP application development, 254–256
- PHP programming for algo development, 256–266
- programming languages, 250
- Consumer confidence, 97
- Correlations and regression model, 102–106
 - correlations, examination of, 104
 - discussion, 106
 - empirical hypothesis, 103
 - methods of, 103–104
 - multiple regression analysis, 104–106
- Cost analysis, 216
- Credit default swaps, 228
- Customer equity, 160
- Customer retention, 119
- Customer retention rate, 130

- Date and time, 260–261
- Dedicated web server setup, 246–248
- Derivatives. *See also* options
 - about, 227–228
 - behavioral economics, behavioral investing based on, 243–244
 - Black-Scholes model as special case
 - of binomial model, 237
 - credit default swaps, 230–231
 - forwards and futures, 240–241
 - implied volatility, 238
 - interest rate swap pricing with
 - prospect theory, 241–243
 - mortgage-backed securities, 229–230
 - options, benefits of, 234
 - options, financial instruments for writing, 236–237
 - options, profiting with, 234–235
 - options and option values, 231–234
 - volatility over time, 239–240
 - volatility smile, 238–239
 - summary, 244
- Detection models for risk propensity, 117–149
- Development environment, 267
- Double log law, anchor prices and, 177–178
- Double log law study
 - alternative models, 171–173
 - background, 169–170
 - conclusion, 173–174
 - data, 171
 - discussion, 174–179
 - hypothesis, 170
 - results, 171
- Dropping table, 275
- Efficient portfolio frontier, 294–296
- Endowment effect
 - anchoring the value of, 155–156
 - behavioral factors that affect fund switching, 153–154
 - in brand switching, 175–176
 - inertia equity to assess, 174–175
 - inertia equity to assess value of, 160–162
 - to model brand switching, 158–160
- European options, 231–232, 238, 298
- Existing revenue models using
 - high-frequency trading, 8–9
- Explicit components, 88
- Explicit consumer decision theory
 - consumer confidence, implicit components of, 97
 - consumer constructs and financial metrics, 98
- ICD theory, 94–96
- ICD theory, theoretical foundation of, 96
- implicit consumer confidence ratios, 99–102
- stock returns, 98–99
- stock returns, implicit investment decisions underlying, 97–98
- Exponents, 260
- Extended hedging strategy, 207–212
- Fechner's law, 170, 172, 173
- Flex programming, 274
- Flex user interface, 286–290
- Floating point numbers, 259, 271
- Functions
 - arguments and results, 265
 - global variables inside, 266
 - use of, 264
- Fund identification, 207
- Fund performance analysis, 146
- Fund selection, 215–216
- Fund strategy, 215
- Fund switching
 - behavioral economics models on, 151–179
 - behavioral factors that affect, 152–157
 - Visual Funds* for, 151–152
- Future data, 203
- Greenspan effect, 99
- Growth function
 - MATLAB to draw, 125–126
 - new, and Bayesian theorem, 124–125
 - prediction and implication, 126–127
- Guessing components, 89

- Hash table vs. hashmap, 273
- Hedging strategies, 213
- High-frequency trading. *See also*
 - origins of high-frequency trading
 - categorization of operations, 9–10
 - definition of, 3–5
 - existing revenue models, 8–9
 - importance of, 5–6
 - and investment management, 32–33
 - and technology, 222–223
 - technology inventions, 34
 - ultimate goals for models and financial inventions, 34–37
 - U.S. firms, 6–7
 - summary, 10–11, 37
- High-frequency trading, history and future
 - with investment management, 29–37
 - investment management and financial institutions, 31–32
 - revenue models in future, 30–31
- High-frequency trading models and existing revenue models, 3–11
 - new, 225–226
- Hindsight bias, 132
- Hyperbolic absolute risk aversion (HAFA), 136
- Implicit components, 87–88
- Implicit consumer decision (ICD)
 - measures
 - interpretation of MDP model, 93–94
 - MDP model, 92
 - transformation to MDP model, 92–93
- Implicit consumer decision (ICD)
 - theory contributions
 - behavioral finance with aggregate perspective, 113–114
 - consumer decision making, implicit components, 111–112
 - consumer sentiment and financial performance, 112–113
- Implicit investor sentiment, 104
- Implicit memory, 87–88, 134
- Implicit utility derivation, 131–139
 - implicit utility function, 136–139
 - investor rating data into observed frequency, 135–136
 - MDP model equations, 134
- Inertia equity
 - arbitrary anchoring on, 164–166
 - to assess endowment effect, 174–175
 - investment implications, 178
- Inertia equity, theory and production
 - anchor competition accounts for, 162–164
 - to assess value of endowment effect, 160–162
 - endowment effects to model brand switching, 158–160
- Inertia ratio, 169
- Inertia value, 158
- Investing revenue model
 - abstraction in investing and trading, 14–15
 - common investing vehicles, 15–17
- Investor sentiment, 194–199
- Irrational choice, 74–76
- Java programming, also jump-starting
 - with
 - about, 266–267
 - arrays, converting an arraylist into, 273
 - arrays and arraylist, data storage from, 273
 - development environment, 267
 - floating numbers, rounding, 271
 - hash table vs. hashmap, 273
 - primitive numbers, integer object conversion, 271
 - random number generation, 271–272
 - sentences into words, 269
 - strings, assembly of, 269–270
 - strings, blank removal of, 270
 - strings, controlling cases of, 270
 - strings, data object creation from, 273
 - strings, validity check of, 270–271
 - substring extraction, 268–269

- Likeability rating data into observed frequencies
 - implicit process properties, 141–143
 - implicit utility function, 140
 - implicit utility function properties, 142–143
 - value functions properties, 140
- Locus effect, 41–45
- Log inertia equity, 170
- Logarithms, 259
- Loss aversion. *See also* behavioral economics models on loss aversion
 - definition of, 41
 - irrational choice and, 75–76
- Loss aversion in option pricing
 - algo (algorithm) demonstration of, 57–59
 - Black-Scholes formula, 63–64
 - computer algos for finding, 61–63
 - visualization of, 59–61
 - summary, 63
- Managerial decisions, 130
- Market neutrality, 219
- MATLAB, 125–126
- Modern portfolio theory (MPT), 16, 182, 186–187, 201, 203, 282
- Money formatting, 260
- Monte Carlo simulation, 293–294
- Mortgage-backed securities, 228
- MPT model to decompose
 - brand-switching matrix, 121–123
- Multinomial decision process (MDP) model, 89–94
 - ICD measures, 92
 - ICD measures, interpretation of, 93–94
 - ICD measures, transformation to, 92–93
- Multinomial models and detection models
 - fund performance analysis, 146
 - implicit utility derivatives, 131–139
 - likeability rating data into observed frequencies, 140–143
 - for risk propensity, 117–149
 - risk propensity definition, 148–149
 - risk propensity of SDT, 147–148
 - signal detection theory (SDT), 143–146
 - value at risk analysis, 147–148
- Multinomial models for equity returns
 - about, 85–87
 - affective components, 88–89
 - correlations and regression model, 102–106
 - empirical approaches, 102
 - explicit components, 88
 - explicit consumer decision theory, 94–102
 - guessing components, 89
 - ICD theory contributions, 111–114
 - implicit components, 87–88
 - literature review, 87–89
 - MDP model, 89–94
 - structural equations model, 106–111
 - summary, 115
- Multinomial models for retail investor growth
 - about, 117–119
 - Bayesian theorem, new growth function with, 124–125
 - CLV equation and CE equation of RLZ model, 120–121
 - growth function, MATLAB to draw, 125–126
 - growth function, prediction and implication, 126–127
 - managerial decisions, 130
 - MPT model to decompose
 - brand-switching matrix, 121–123
 - new growth development, 119–129
 - peak analysis, 127
 - peak growth rate, 127
 - retention rate and market share, 127–129
 - theoretical implications, 129
- Multinomial processing tree model, 89–94

- NBA (National Basketball Association)
 - event and uncertainty account
 - irrational choice and choice anomalies, 72–75
 - irrational choice and loss aversion, 75–76
 - summary, 75–76
- Net present value (NPV) calculation, 284–286
- New growth development, 119–129
- Non-parametric SDT, 145–146
- Option pricing. *See also* loss aversion
 - in option pricing
 - anchoring and uncertainty, 71–72
 - controlled offline data, 77–80
 - general discussion, 80–82
 - managerial implications, 81–82
 - NBA event, 66–67
 - NBA event and uncertainty account, 72–76
 - option size expansion, 65–83
 - procedure and choice reversal, 70
 - switchers, 71
 - theoretical analysis, 69
 - theoretical implications, 80–81
 - web data, 67–69
 - summary, 82–83
- Options
 - American options, 231–232
 - benefits of derivatives, 234
 - European options, 231–232, 238, 298
 - financial instruments for writing
 - derivatives, 236–237
 - and option values, 231–234
 - profiting with derivatives, 234–235
- Origins of high-frequency trading
 - about, 13–14
 - back-office revenue model, 20
 - cash management revenue model, 19
 - investing revenue model, 14–17
 - investment banking revenue model, 17–18
 - market making revenue model, 18
 - merger and acquisition revenue model, 20
 - new revenue model creation, 21–22
 - personal success drivers, 22–26
 - trading revenue model, 18–19
 - venture capital revenue model, 20–21
 - summary T, 27
- OTC derivatives, 226, 227
- Ownership bias, 176
- Passing value by reference, 264–265
- Peak analysis, 127
- Peak growth rate, 127
- Personal success drivers, 22–26
- PHP and HTML, 257
- PHP file location, 257
- PHP files on web browsers, 257–258
- PHP programming for algo
 - development, 256–266
 - arrays, element deletion, 262
 - arrays, extreme values in, 264
 - arrays, iterating through, 262
 - arrays, merging, 263
 - arrays, searching in, 263
 - arrays, using, 261
 - arrays into strings, 263
 - base conversion, 260
 - date and time, 260–261
 - exponents, 260
 - floating point numbers, 259
 - functions, arguments and results, 265
 - functions, global variables inside of, 266
 - functions, use of, 264
 - logarithms, 259
 - money formatting, 260
 - passing value by reference, 264–265
 - PHP and HTML, 257
 - PHP file location, 257
 - PHP files on web browsers, 257–258
 - random number creation, 259
 - substrings, extracting, 258
 - substrings, locating, 258
 - variables, checking, 259
- Portfolio management with SAPE
 - algos, 222
- Preference bias indicator, 145

- Primitive numbers, integer object
conversion, 271
- Probability from z scores, 279–281
- Program trading, 29
- Psychophysics laws, 170, 177
- Put options, 4, 58, 61, 186, 207, 213,
232–237. *See also* American
options; European options
- Random number creation, 259
- Random number generation,
271–272
- Records, updating, 276
- Reference prices, 151–179
- Research using signal detection theory
(SDT), 179
- Retention rate and market share,
127–129
- Revenue models
back-office, 20
cash management, 19
creation of new, 21–22
existing, using high-frequency
trading, 3–11
future, 30–31
investing, 14–17
investment banking, 17–18
market making, 18
merger and acquisition, 20
trading, 18–19
venture capital, 20–21
- Risk propensity
definition, 148–149
of SDT, 147–148
- RLZ model, 120–121
- SAPE and high-frequency trading,
221–223
high-frequency trading and
technology, 222–223
portfolio management with SAPE
algorithms, 222
- SAPE for portfolio management
about, 201–203
advanced trading strategies with
SAPE, 217–221
intraday evidence of effectiveness
of, 203–205
SAPE and high-frequency trading,
221–223
SAPE investment strategy study,
206–214
trading process with SAPE study,
214–217
trading strategies using SAPE funds,
206
summary, 223
- SAPE investment strategy study
about, 206–207
arbitrage and hedging strategy
evaluation, 212–213
extended hedging strategy, 207–212
fund identification, 207
plans, 207
summary, 213–214
- Select statement, 275
- Sentences into words, 269
- Sentiment asset pricing engine
(SAPE). *See also* advanced
trading strategies with SAPE;
SAPE for portfolio management;
SAPE investment strategy study;
trading process with SAPE study
alternative investment tools of
macro investor sentiment,
194–199
contribution of, 187–190
described, 185–187
effectiveness of algos for, 190–191
engines built on, 193–194
implementations of, 191–193
primary users of, 191
summary on, 194
- Sentiment asset pricing engine (SAPE)
for portfolio management,
181–183
- Sharpe ratio, 146, 202, 204, 282–284
- Sigma (standard deviation volatility),
147, 238
- Signal detection theory (SDT),
143–144, 296–298
non-parametric SDT, 145–146
research using, 179

- SQL (structured query language)
 - dropping table, 275
 - records, updating, 276
 - select statement, 275
 - table creation, 274–275
 - tables, data insertion, 275
 - tables, record deletion, 275
- Status quo bias, 42–46, 49, 75–76, 153, 155, 159. *See also* endowment effect; inertia equity
- Stevens' law, 153, 172–174, 178, 179
- Strings
 - assembly, 269–270
 - blank removal, 270
 - controlling cases, 270
 - data object creation, 273
 - validity check, 270–271
- Structural equations model, 106–111
 - discussion, 110–111
 - empirical hypothesis, 107–109
 - methods of, 108–109
 - results, 109–110
- Substrings
 - extracting, 258, 268–269
 - locating, 258
- Swaps, 228. *See also* credit default swaps
- Tables
 - creation of, 274–275
 - data insertion, 275
 - record deletion, 275
- Tangency portfolio, 203
- Technology infrastructure for algo
 - creation, 245–277
 - C++ programming, 273
 - computer algo development, 248–256
 - dedicated web server setup, 246–248
 - flex programming, 274
 - Java programming, algo
 - jump-starting with, 266–273
 - SQL (structured query language), 274–276
 - UNIX/LINUX commands for algo
 - development, 276
 - web hosting vs. dedicated web servers, 245–246
 - summary, 277
- Threshold, 178
- Trading frequency, 215
- Trading process with SAPE study
 - about, 214–215
 - basic strategy, 215
 - breakeven analysis, 216–217
 - cost analysis, 216
 - fund selection, 215–216
 - fund strategy, 215
 - trading frequency, 215
- Tranches, 230
- UNIX/LINUX commands for algo
 - development, 276
- Value at risk analysis, 147–148
- Variables, 259
- Visual Funds*, 151–152
- Volatility
 - calculation with ARCH formula, 292–293
 - sigma (in standard deviation), 147, 238
- Web hosting vs. dedicated web servers, 245–246
- Web Investor Confidence Index (WICI), 197–199
- Weber-Fechner's laws, 170, 173–174
- Weber's law, 43, 154–155, 169–173
- Z scores from probability, 281–282