

INDEX

- 80:20 rule 62
- absolute VaR 57
- accessible population 152–3
- aggregation of risks 32
- Aitken, Alexander Craig 93
- Akaike's information criterion 141
- analytical expression 65–6
- auditor's mission 8–9
- avoiding impossible provisions 52

- back-testing 170–1
- Basel Accord 170
- Basel II Accord 178
- Bayes, Reverend Thomas 121
- Bayesian classifiers 141
- Bayesian model averaging 128
- Bayes's theorem 121–2
- bell curve 75
- Benford's Law 64
- Bernoulli distribution 67–8
- Bernoulli trial 68
- best estimates of parameters 135
- best guess forecasts 97
- best versus true explanation 128
- beta distribution 82
- binomial distribution 68–9
- binomial options pricing model 175
- Black, Fischer 173
- Black–Scholes 173–5
 - formula 174–5
 - model 174
 - partial differential equation 174
- Brier Score 15
- budgets 52
- business prediction models 83–4

- calibration 74
- categorical distribution 67
- causal modelling 114
- causation 149–50
- central limit theorem 75
- chaos theory 91
- classification and regression trees 141
- closed form 66
- closed formula 66
- cluster sampling 156–7
- coefficient of determination 145–6
- combining evidence 120
- conditional dependence and
 - independence 112–13
- conditional probabilities 36–7
- conditional VaR 165
- confidence interval 138
- confirmatory data analysis 143
- confusing money and utility 44
- conjugate distributions 126–7
- continuous random variables 38–9
- continuous uniform distribution 70–1
- copulas 113–14
- correlation 113
- countable 38

- countable infinity 38
- Cox, Richard Threlkeld 18
- credit crunch 1, 8, 56, 89, 144
- cross validation 145
- cumulative probability distribution
 - function 41–2
- data mining 141–2
- decision tree 109
- definition of measurements 148
- degree of belief 18–19
 - about an outcome 22–3
 - about long run relative frequency 21–2
- delta 176
- discrete 30
- discrete random variables 37–8
- discrete uniform distribution 62
- diversification 172
- downside probability 55–6
- dropouts 159
- dynamic models 116
- ensemble forecasting 91
- equal probability sampling 155
- estimators 135–7
- eta 6
- European call options 173
- event 30–1
 - undramatic 31
- events with unspecified boundaries 31
- Excel 93, 104–5, 106
- excessive focus on expected values 51
- exhaustive, mutually exclusive
 - hypotheses 118–19
- expected value 50–1
- experiment 19–20
- explicit formula 66
- exploratory data analysis (EDA) 143
- exponential moving average 116
- extrapolation 143–4
- extreme value theory 164
- extreme values 164–5
- famous Bayesians 121
- finite population 160
- Fisher, Sir Ronald Aylmer 132
- flaw of averages 99–100
- fooled by randomness 102–3, 104
- football matches 117–18, 149–50
- fraud 64
- function 34–5
- Gaussian distribution 74–6
- general linear model 180
- generalized extreme value distribution 165
- generalized linear models 179–80
- generalized Pareto distribution 165
- genetic programming 141
- Greeks 175–6
- group sequential sampling 157
- guessing impact 111
- happy history 147
- Haug, Espen 174
- hedge 172
- heteroskedasticity 169
- historical simulation 168
- Hooke, Robert 92
- Hooke's law 92
- hyperparameters 126
- hypothesis testing 129–30
- hypothesis testing in business 130
- ice cream 98–9, 100, 106
- ignorance function 15–16
- ignoring impact spread 43
- ignoring measurement uncertainty 96
- ignoring mixed random variables 40

- ignoring model uncertainty 95
- ignoring real options 109
- ignoring uncertainty about probabilities 25
- iid 112
- independence testing 170
- independent and identically distributed 112
- infinite population 160
- infinity 37
- information graphics 148
- information theory 16
- interpolation 143–4

- Jaynes, Edwin Thompson 18
- join distribution 80
- joint normal distribution 81
- judging probabilities 17

- Kolmogorov, Andrey Nikolaevich 34

- Laplace, Pierre-Simon 12
- latin hypercube 114–15
- least squares fitting 138–40
- linear correlation 113
- liquidity black hole 165
- logarithmic score function 15
- logarithms 54, 79
- lognormal distribution 79
- long run relative frequency (LRRF) 20–1
- long tail 62
- loss distributions 176–7
- lost assumptions 89
- lottery 29
- lower partial moment 56

- Markov Chain Monte Carlo 127
- Markowitz, Harry 49
- mathematical approach 7
- mathematical model 85–6

- maximum likelihood estimation (MLE) 132–4
- maximum a posteriori estimation (MAP) 131
- mean a posteriori estimation 131
- mean squared error 131
- mean value of a probability distribution 50–1
- measurement uncertainty 96
- median a posteriori estimation 132
- Merton, Robert C. 173
- mismatched interpretations of probability 24
- missing ranges 32
- misunderstanding 'expected' 51–2
- mixed discrete-continuous random variables 39–40
- mixed populations 152
- mixed random variables 39–40
- mixing models and registers 86
- MLE *see* maximum likelihood estimation
- model fitting 123–5
- model inputs 90, 90–1
- model parameter uncertainty 94
- model structure 88
 - uncertainty 94
- model uncertainty 94–5
- monetary unit sampling 156
- Monte Carlo simulation 105–8
- moving average 116
- multi-modal distributions 78
- multinomial distribution 70
- mutual information 146
- myth of mathematical clarity 5–6
- myths of quantification 7

- neural networks 141
- non-parametric continuous distributions 78
- non-parametric distributions 65

- normal distribution 74–6
- normality tests 77
- not using data to illuminate probabilities 25–6
- null hypothesis 129
- numerical approximation uncertainty 94
- numerical equation solving 93

- Olympic Games 52
- operational loss data 178–9
- optimization 90
- outcome space 26–7
- outcomes
 - represented with numbers 29
 - represented without numbers 28
- over-fitting 140–1

- parametric distribution 65
- parametric portfolio model 170
- Pareto distribution 71–3
- Pareto, Vilfredo 72
- pension fund 163
- Poisson distribution 69–70
- population 84
- portfolio 57
 - effect 172
 - mapping function 167
 - models 166–7
 - theory 49
- possibility space 26–7
- posterior probabilities 120
- power law distribution 71–3
- prediction
 - algorithm 94
 - errors 94
 - formula structure 91–3
 - formulae 89
 - intervals 97–8
- prejudging sample sizes 158–9
- prior probabilities 120
- probabilistic forecaster 13–14
- probabilistic models 86–8
- probabilities 12
 - probabilities applied to alternative hypotheses 119
- probability
 - of an event 34
 - of an outcome 33
 - density function 45–7
 - distribution 34–5
 - distribution function 34–5
 - function 34–5
 - impact matrix numbers 53–4
 - interpretation 17
 - mass function 44–5
 - measure 34–5
 - proportional to size sampling 156
 - sample 154
 - times impact 58
- process 84
- propagating uncertainty 98–9
- proper score function 15–16
- pseudo random number generation
 - 104–5
- put option 173

- quantum theory 102

- R^2 145–6
- RAND() 104
- random 100–1
 - sample 154
 - variable 29
- randomness tests 105
- real life random 102
- real number 38
- real numbers 29
- regression 115–16
- relative VaR 58
- reliability 14

- resampling 114
- resolution 14–15
- risk 49–50
 - appetite 45
 - factor 166–7
 - factors 166–7
 - register 32, 43, 53, 59
 - registers 11, 28, 31, 39, 40, 86, 111
 - and reward 171
 - RiskMetrics variance model 169
- robust estimators 140
- sample 152
 - size 151
 - space 26–7
- sampling
 - distribution 138
 - frame 153
 - method 153–4
 - without replacement 160
- Savage, Sam 99
- Scholes, Myron 173
- searching for ‘significance’ 142
- semi-variance 55
- sequential sampling 157
- sharpness 47–8
- significance 142, 150
- silly extrapolation 144
- simple random sampling 155
- simulations 90
- situation 19–20
- small populations 160–1
- Solver 93
- spurious regression results 147
- standard deviation 55
- standard error 138
- Star Trek* 95
- statistical models 86–8
- stepwise regression 147
- stochastic models 86–8
- stratified sampling 155
- stress testing 165
- support vector machines 141
- symbolic algebra systems 66
- system 84
- systematic sampling 156
- Taleb, Nicholas 174
- theoretically random 101–2
- theta 176
- thin tails 80
- time to double your money 16
- top 10 risk reporting 32
- tornado diagram 109–11
- training data set 145
- triangular distribution 73–4
- Tukey, John 143
- unbiased estimator 135
- uncountably infinite 38, 40
- understatement of risk 9
- unspecified situations 27–8
- utility 44
- validation data set 145
- valuation function 167
- value at risk (VAR) 56–8
- variance 54
- vega 176
- volatility pumping 172
- weather forecasting 7, 15
- Zipf distribution 62–3

<http://www.pbookshop.com>