

Material on this website referred to in Malcolm Kemp's book on Extreme Events

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Section	Section Title	Description	Hyperlink?
2.3.2 [foot]	Risk measures	Coherent risk measures	yes
2.4.1 [foot]	Monte Carlo simulations	Ability to reproduce results of some such exercises analytically, i.e. without resorting to Monte Carlo simulation techniques	no
2.4.2	Statistics	Formulae for skew (skewness) and kurtosis where different weights are given to different observations	yes
2.4.3	Fat tails	Derivation of Cornish-Fisher asymptotic expansion	yes
2.4.5 [foot]	Curve fitting	Techniques for fitting polynomials through data series	yes
2.4.6	Statistical tests for non-Normality	skew, kurtosis and Jarque-Bera tests when n is not large (using Monte Carlo simulations)	no
2.4.6	Statistics	Statistical tests for Normality	yes
2.5.2	Statistics	Characteristic functions for a range of distributional forms	yes
2.6 [foot]	Diversification	(excess) kurtosis of a binomial distribution	yes
2.7.2	Probability distributions	How mixtures of normal distributions can lead to fat-tails	yes
2.8	Stable distributions	Detailed analysis of stable distribution and tools for manipulating stable distributions	no
2.8.2	Stable distributions	Special cases where Stable distribution has analytical form	yes
2.8.4	Stable distributions	Further discussion of QQ-plots for Stable distributions	no
2.9.2	Extreme Value Distributions	Features of Extreme Value Distributions	yes
2.10	Parsimony	Some dangers of over-fitting	yes
2.13.3	Statistics	Giving greater weight to observations that correspond to longer 'proper' time periods	yes
3.3.2	Fat tails (in multiple return series simultaneously)	Box counting algorithms	no
3.8.2 [foot]	Curve fitting	Arranging for curve fits to exhibit 'adequate' smoothness	no
3.8.5	Relative entropy	The concept of entropy in statistics	no
3.8.5	Non-linear cluster analysis	Defining 'similarity' by reference	no

		merely to the copula	
4.3.3 [foot]	Principal components analysis	Weighted covariance matrices	yes
4.7.2	Explaining market dynamics	How traditional time series analysis typically uses regression techniques	yes
4.8.2	Distributional mixtures	The EM algorithm	yes
4.10	Minimisation/maximisation	Run time constraints with large numbers of instruments	no
4.10.2 [foot]	Numerical techniques	Using golden section search techniques to find local extrema	no
5.4.6	Dual benchmarks	Position when we have two different covariance matrices	no
5.9.2	Backtesting risk-reward trade-offs	Arithmetic, geometric and logarithmic relative returns	yes
6.3.3	Probability distributions	The exponential family of distributions	no
6.11.6	Monte Carlo simulations	Simulations when the copula is 'fat-tailed'	no
7.4.8	Portfolio construction	Applying statistical tests to optimal portfolios	no
7.6	Portfolio construction	Optimal strategies in the presence of transaction costs on multiple assets	no
7.9.2	Portfolio construction	Adjusting for time-varying volatility using weighted covariance matrices	yes
7.11.2	Portfolio construction	Numerical integration	no
7.11.5	Portfolio construction	Need for risk measures used with non-Normal distributions to be coherent and sub-additive	no
8.3.2 [foot]	Value-at-risk	What VaR level corresponds to the worst outcome in n events?	yes