

1. Record Nr.	UNINA9910139552503321
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Titolo	Financial risk forecasting [[electronic resource] ] : the theory and practice of forecasting market risk, with implementation in R and Matlab // Jon Danielsson
Pubbl/distr/stampa	Chichester, West Sussex, U.K., : Wiley, 2011
ISBN	1-119-97711-8 1-119-20586-7 1-283-40512-1 9786613405128 1-119-97710-X
Descrizione fisica	1 online resource (298 p.)
Collana	Wiley finance series
Disciplina	658.155 658.1550112
Soggetti	Financial risk management - Forecasting Financial risk management - Simulation methods R (Computer program language) Gestió financera Gestió del risc Previsió Mètodes de simulació Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. [255]-258) and index.
Nota di contenuto	Financial Risk Forecasting; Contents; Preface; Acknowledgments; Abbreviations; Notation; 1 Financial markets, prices and risk; 1.1 Prices, returns and stock indices; 1.1.1 Stock indices; 1.1.2 Prices and returns; 1.2 S&P 500 returns; 1.2.1 S&P 500 statistics; 1.2.2 S&P 500 statistics in R and Matlab; 1.3 The stylized facts of financial returns; 1.4 Volatility; 1.4.1 Volatility clusters; 1.4.2 Volatility clusters and the ACF; 1.5 Nonnormality and fat tails; 1.6 Identification of fat tails; 1.6.1 Statistical tests for fat tails; 1.6.2 Graphical methods for fat tail analysis 1.6.3 Implications of fat tails in finance 1.7 Nonlinear dependence; 1.7.1

Sample evidence of nonlinear dependence; 1.7.2 Exceedance correlations; 1.8 Copulas; 1.8.1 The Gaussian copula; 1.8.2 The theory of copulas; 1.8.3 An application of copulas; 1.8.4 Some challenges in using copulas; 1.9 Summary; 2 Univariate volatility modeling; 2.1 Modeling volatility; 2.2 Simple volatility models; 2.2.1 Moving average models; 2.2.2 EWMA model; 2.3 GARCH and conditional volatility; 2.3.1 ARCH; 2.3.2 GARCH; 2.3.3 The "memory" of a GARCH model; 2.3.4 Normal GARCH; 2.3.5 Student-t GARCH; 2.3.6 (G)ARCH in mean; 2.4 Maximum likelihood estimation of volatility models; 2.4.1 The ARCH(1) likelihood function; 2.4.2 The GARCH(1,1) likelihood function; 2.4.3 On the importance of 1; 2.4.4 Issues in estimation; 2.5 Diagnosing volatility models; 2.5.1 Likelihood ratio tests and parameter significance; 2.5.2 Analysis of model residuals; 2.5.3 Statistical goodness-of-fit measures; 2.6 Application of ARCH and GARCH; 2.6.1 Estimation results; 2.6.2 Likelihood ratio tests; 2.6.3 Residual analysis; 2.6.4 Graphical analysis; 2.6.5 Implementation; 2.7 Other GARCH-type models; 2.7.1 Leverage effects and asymmetry; 2.7.2 Power models; 2.7.3 APARCH; 2.7.4 Application of APARCH models; 2.7.5 Estimation of APARCH; 2.8 Alternative volatility models; 2.8.1 Implied volatility; 2.8.2 Realized volatility; 2.8.3 Stochastic volatility; 2.9 Summary; 3 Multivariate volatility models; 3.1 Multivariate volatility forecasting; 3.1.1 Application; 3.2 EWMA; 3.3 Orthogonal GARCH; 3.3.1 Orthogonalizing covariance; 3.3.2 Implementation; 3.3.3 Large-scale implementations; 3.4 CCC and DCC models; 3.4.1 Constant conditional correlations (CCC); 3.4.2 Dynamic conditional correlations (DCC); 3.4.3 Implementation; 3.5 Estimation comparison; 3.6 Multivariate extensions of GARCH; 3.6.1 Numerical problems; 3.6.2 The BEKK model; 3.7 Summary; 4 Risk measures; 4.1 Defining and measuring risk; 4.2 Volatility; 4.3 Value-at-risk; 4.3.1 Is VaR a negative or positive number?; 4.3.2 The three steps in VaR calculations; 4.3.3 Interpreting and analyzing VaR; 4.3.4 VaR and normality; 4.3.5 Sign of VaR; 4.4 Issues in applying VaR; 4.4.1 VaR is only a quantile; 4.4.2 Coherence; 4.4.3 Does VaR really violate subadditivity?; 4.4.4 Manipulating VaR; 4.5 Expected shortfall; 4.6 Holding periods, scaling and the square root of time

## Sommario/riassunto

Financial Risk Forecasting is a complete introduction to practical quantitative risk management, with a focus on market risk. Derived from the authors teaching notes and years spent training practitioners in risk management techniques, it brings together the three key disciplines of finance, statistics and modeling (programming), to provide a thorough grounding in risk management techniques. Written by renowned risk expert Jon Danielsson, the book begins with an introduction to financial markets and market prices, volatility clusters, fat tails and nonlinear dependence. It then goes o