

QUANTITATIVE RISK & PORTFOLIO MANAGEMENT

Don't trust black-box software! Avoid mistakes while managing your positions.

2-Day Training Course

28th – 29th August, 2006
Singapore, *Marriott*

Dr. Attilio Meucci, CFA

Vice President, Lehman Brothers
Adjunct Professor, Courant Institute - New York University
Adjunct Professor, Columbia University (New York)
Visiting Professor, Imperial College (London)
Visiting Professor, Bocconi University (Milan)



Learn from the best on the latest in:

- Estimation Techniques
- Market Modelling
- Portfolio Evaluation
- Portfolio Optimization
- Allocation Techniques

The course covers all aspects of quantitative portfolio management and risk management from the foundations to the state of the art in the industry

This course is taught in full semester format in the Master's in Financial Mathematics at the Courant Institute, New York University and in the Master's in Financial Engineering at Columbia University, the two world's leading programmes in the field.

The course is based on Dr. Attilio Meucci's bestseller, *Risk and Asset Allocation – Springer Quantitative Finance* (details on Page 3). All delegates will be given a free copy of the book. **Delegates register after 21st July 2006 may receive the book after the course.

The required level of mathematical background is kept at a minimum: the most advanced statistical and optimization techniques are introduced and thoroughly discussed by means of live MATLAB[®] simulations, intuitive geometrical representations, figures, and plenty of examples. The software will be made available to delegates

*Participants may be eligible for Financial Sector Development Fund (FSDF) support on a case by case basis. Interested applicants should submit their applications to the FSDF Secretariat directly. For enquiries, please contact the FSDF secretariat at 6229 9396 or via email at fsdf@mas.gov.sg

DAY 1 – 28th August 2006

Morning Session: Multivariate Statistics

- Glivenko-Cantelli theorem and Monte Carlo simulations
- Shape summary statistics and location-dispersion ellipsoid
- Copulas
- The role of correlation
- Important distributions for modelling the financial markets

Who should attend:

Portfolio Managers, Risk Managers, Financial Engineers, Financial Analysts, Quantitative Analysts, Dealers, Brokers, Traders, Regulators and Researchers dealing in the following areas:

- Equities
- Interest Rate Products
- FX
- Commodities
- Credit
- Emerging Markets
- Hedge Funds

Afternoon Session: Estimation Techniques

- Estimators: definitions and practical evaluation
- Non-parametric estimators
 - ◇ Sample quantile and order statistics (VaR estimator)
 - ◇ Sample mean/covariance and best-fitting ellipsoid
 - ◇ Sample factor loadings and ordinary least squares
- Maximum-likelihood estimators: assumptions on the market distribution
 - ◇ Normal hypothesis: sample estimators
 - ◇ Non-normal hypothesis: outlier rejection
- Shrinkage estimators: efficiency versus bias
 - ◇ Stein mean
 - ◇ Ledoit-Wolf covariance
- Robust estimators: what if the assumptions on the market distribution are wrong?
 - ◇ Assessing robustness: the influence function
 - ◇ High-breakdown estimators
- Bayesian estimators: including the practitioner's experience
 - ◇ Analytically tractable examples
 - ◇ Numerical techniques
- Missing observations: estimation from unbalanced panels
 - ◇ E-M algorithm
 - ◇ ML marginalization

DAY 2 – 29th August 2006

Morning Session: Market Modelling and Portfolio Evaluation

- The quest for invariance in the markets
 - ◇ Equities: log-returns
 - ◇ Fixed-income: changes in yield to maturity
 - ◇ Derivatives: changes in at-the-money implied volatility
- Projection of the market distribution at the investment horizon: the FFT technique
- Pricing: analytical, approximate (delta-gamma), full Monte Carlo
- Dimension reduction, theory:
 - ◇ Principal component analysis (implicit risk factors)
 - ◇ Linear regression (explicit risk factors)
- Dimension reduction, notable examples
 - ◇ Capital Asset Pricing Model
 - ◇ Arbitrage Pricing Theory
 - ◇ Fama-French factors
 - ◇ Principal component analysis of the swap market
- Investor's objectives
 - ◇ Total return
 - ◇ Benchmark allocation
 - ◇ Net profits
- Global evaluation of a portfolio: stochastic dominance
- Summary evaluation of a portfolio: indices of satisfaction
 - ◇ Sharpe ratio and information ratio
 - ◇ Expected utility and certainty-equivalent
 - ◇ Quantiles and value at risk (VaR)
 - ◇ Expected shortfall (ES), conditional value at risk (CVaR)
 - ◇ Other coherent measures of performance

Afternoon Session: Portfolio Optimization

- Constrained optimization: computationally tractable problems
 - ◇ Linear and quadratic programming
 - ◇ Second order and semi-definite cone programming
- Mean-variance optimization
 - ◇ Numerical solutions
 - ◇ Pitfalls of the mean-variance approach
- Market asymmetries and the Mean-CVaR approach
 - ◇ Theoretical framework
 - ◇ Numerical solutions
- Total return vs. benchmark allocation
- Simple allocation techniques
 - ◇ General equilibrium / benchmark-implied allocations
 - ◇ Sample-based allocation: leverage of estimation risk
- Advanced allocation techniques
 - ◇ Bayesian allocation
 - ◇ Black-Litterman allocation
 - ◇ Copula-opinion pooling allocation
 - ◇ Resampled allocation
 - ◇ Robust allocation
 - ◇ Robust Bayesian allocation

About the trainer:

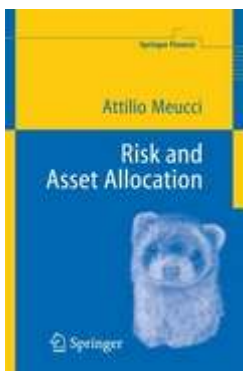
Dr. Attilio Meucci holds a BA summa cum laude in Physics and a PhD in Mathematics from the University of Milan, an MA in Economics from Bocconi University in Milan, and is CFA charterholder.

Dr. Attilio Meucci is a vice president at Lehman Brothers, Inc., New York, in the fixed-income research division. Before joining Lehman, he was a trader at Relative Value International, a hedge fund in Greenwich, CT. Previously, he was at Bain & Co., where he designed solutions for risk management, portfolio insurance, tactical and strategic asset allocation.

Dr. Attilio Meucci is the author of the bestseller *Risk and Asset Allocation* (see below) and several other publications. He has taught graduate courses on quantitative portfolio management and risk management in top schools worldwide and he is frequently invited as a speaker to conferences, financial institutions and universities.

Find more information on Dr. Attilio Meucci at www.symmys.com

About “Risk and Asset Allocation” – Springer Quantitative Finance



The book contains a detailed exposition spanning all the steps of one-period allocation from the foundations to the most advanced developments. Multivariate estimation methods are analyzed in depth, including non-parametric, maximum-likelihood under non-normal hypotheses, shrinkage, robust, and very general Bayesian techniques. Evaluation methods such as stochastic dominance, expected utility, value at risk and coherent measures are thoroughly discussed in a unified setting and applied in a variety of contexts, including prospect theory, total return and benchmark allocation. Portfolio optimization is presented with emphasis on estimation risk, which is tackled by means of Bayesian, resampling and robust optimization techniques. All the statistical and mathematical tools, such as copulas, location-dispersion ellipsoids, matrix-variate distributions, cone programming, are introduced from the basics. Comprehension is supported by a large number of figures and examples, as well as real trading and asset management case studies.

“This book takes the reader on a journey through portfolio management starting with the basics and reaching some fascinating terrain. Attilio Meucci shows a real talent for explaining the most difficult of subjects in a very clear manner.”

Paul Wilmott, wilmott.com

“This book fills a gap...It brings together in a logical sequence a vast sway of work by statisticians and economists on optimal allocation among risky assets...Meucci’s book is comprehensive and rigorous, from presenting basic statistical tools to framing the optimisation problem and solving it.”

Risk Magazine review by Jacques Pezier, Visiting Professor, ICMA Centre, University of Reading

“This exciting new book takes a fresh look at asset allocation and offers up a masterly account of this important subject. The quantitative emphasis and included MATLAB software make it a must-read for the mathematically oriented investment professional!”

Peter Carr, Head of Quantitative Research, Bloomberg LP
Director of Masters in Mathematical Finance program, NYU

“A wonderful book! Mathematically rigorous and yet practical, heavily illustrated with graphs and worked examples, Attilio Meucci has written a comprehensive treatment of asset allocation starting from statistical concepts, covering investment primitives, and leading to portfolio optimization in a Bayesian context with parameter uncertainty.”

Bob Litterman, Head of Quantitative Resources, Goldman Sachs Asset Management

“Meucci’s *Risk and Asset Allocation* is one of those rare books that take a completely fresh look at a well-studied problem, optimal financial portfolio allocation based on statistically estimated models of risk and expected return. Designed for graduate students or quantitatively oriented asset managers, Meucci provides a sophisticated and integrated treatment, from investment theory, to optimization methods, to statistical analysis of multi-variate return data, through computational implementation of the results. This is rigorous and relevant!”

Darrell Duffie, Professor of Finance, Graduate Business School, Stanford University