



Dr Attilio Meucci, CFA

Advanced Risk and Portfolio Management

The Only Heavily Quantitative, Omni-Comprehensive, Intensive Buy-Side Bootcamp

June 26-28, 2008

Courant Institute, Room 109, 251 Mercer Street, New York, NY 10012

The workshop covers all aspects of quantitative risk and portfolio management from the foundations to the newest developments:

- Multivariate statistics and stochastic processes
- Multivariate estimation in non-normal markets
- Market modeling
- Pricing
- Portfolio evaluation
- Generalized risk decomposition
- Advanced portfolio management techniques
- Liquidity and transaction costs

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 workshop is based on Dr. Meucci's bestseller *Risk and Asset Allocation* – Springer. Participants will receive a complimentary copy of the book and all the code used in the demos

Audience

Buy-side practitioners (portfolio managers and risk managers with solid quantitative background) will deepen and broaden their understanding of the recipes they implement everyday and will learn the most cutting-edge techniques

Academics and sell-side practitioners (traders, financial engineers, quantitative analysts, research teams) will understand the big-picture and the details of buy-side finance in a concise, quantitative language to them familiar

Registration and more information

Register at www.cims.nyu.edu/~arpm2008

For questions or inquiries

- E-mail: arpm2008@cims.nyu.edu
- Phone: 1 212 998 3194

About the instructor

- Senior executive in top-tier Wall Street firm
 - Adjunct professor, MSMF, Courant-NYU
 - CFA chartholder, PhD Math, MA Econ, BA Phys
- more at www.symmys.com

“ONE MORE REASON”

Attilio will waive all fees. Furthermore, each dollar paid will turn into a fifty cent donation to

- Coalition For The Homeless - New York, www.coalitionforthehomeless.org
- Doctors Without Borders - www.doctorswithoutborders.org
- Care of China's Orphaned and Abandoned - www.cocoa.org.uk

more at www.symmys.com



Day 1 – Thursday, 26 June 2008

Morning Session (8:30-12:30)**Multivariate Statistics**

- Representations of distributions
 - analytical (pdf, cdf, quantile, cf)
 - Monte Carlo simulations
- Copula-marginal factorization
 - marginals/grades
 - pdf, cdf, simulations of copulas
 - special copulas
- Dependence/concordance statistics
 - Schweizer-Wolff measure
 - Kendall tau
 - Spearman rho
- Summary statistics
 - location-dispersion ellipsoid
 - principal component factorization
 - higher order statistics
- Correlation: theory, practice and pitfalls
- Multivariate distributions for the markets
 - (matrix-variate) normal
 - Student t and elliptical
 - Log-distributions
 - Wishart distribution
 - order statistics
 - mixture distributions

Afternoon Session (14:00-18:00)**Multivariate Estimation**

- Estimators: definition and evaluation
 - loss, bias, inefficiency, error
 - generalized hypothesis testing
- Non-parametric estimators
 - order statistics and VaR estimator
 - sample mean/covariance: best-fitting ellipsoid
 - sample factor loadings: ordinary least squares
- Multivariate MLE: location, scatter, loadings
 - normal hypothesis: sample estimators
 - non-normal hypothesis: outlier rejection
- Multivariate shrinkage: location, scatter, loadings
 - Stein mean
 - Ledoit-Wolf covariance
- Multivariate robust: location, scatter, loadings
 - assessing robustness: the influence function
 - M-robust estimators
 - outlier detection and high-breakdown ellipsoid
- Multivariate Bayesian: location, scatter, loadings
 - analytically tractable examples
 - numerical techniques
- Missing observations and unbalanced panels
 - EM algorithm
 - ML marginalization

Day 2 – Friday, 27 June 2008

Morning Session (8:30-12:30)**Market Modeling**

- The quest for invariance
 - equities: log-returns
 - fixed-income: changes in yield to maturity
 - derivatives: changes in ATM implied volatility
- Advanced dynamics
 - Levy processes
 - ARMA, long-memory processes
 - GARCH, stochastic volatility, subordination
 - multivariate dynamics and cointegration
- Projection to horizon: the FFT technique
- Pricing
 - analytical
 - second-order (gamma/convexity)
 - full Monte Carlo
- Dimension reduction
 - principal component analysis
 - explicit factors

Afternoon Session (14:00-18:00)**Risk Management**

- Dimension reduction, notable examples
 - Capital Asset Pricing Model
 - Multi-factors models
 - PCA of the swap market
- Investor's objectives
 - total return
 - benchmark allocation
 - net profits
- Global portfolio evaluation: stochastic dominance
- Summary portfolio evaluation: satisfaction
 - non-dimensional indices (Sharpe/info ratio, omega)
 - expected utility and certainty-equivalent
 - quantiles and value at risk (VaR)
 - coherent measures and exp. shortfall (CVaR)
 - spectral measures of performance
- Volatility/VaR/CVaR/Risk decomposition
 - elliptical markets: semi-analytical
 - generic markets: Monte Carlo panel smoothing



Day 3 – Saturday, 28 June 2008

Morning Session (8:30-12:30)**Portfolio Management I**

- Constrained optimization: tractable problems
 - linear and quadratic programming
 - second order and semi-definite cone programming
- Mean-variance optimization
 - analytical: two-fund theorem
 - numerical: quadratic programming
 - pitfalls of the mean-variance approach
- Total return vs. benchmark allocation
- Market asymmetries: mean-CVaR optimization
- Estimation risk: allocations as decisions
 - opportunity cost
 - allocation decisions evaluated as estimators
- Simple allocation techniques
 - general equilibrium/benchmark implied allocation
 - prior allocation
 - sample-based allocation

Afternoon Session (14:00-18:00)**Portfolio Management II**

- Bayesian allocation
 - predictive return
 - classical-equivalent
- Black-Litterman allocation
 - views on parameters
 - views on market
- Beyond Black-Litterman: non-normal markets
- Robust allocation (SOCP)
 - elliptical uncertainty sets
 - box uncertainty sets
- Robust/Bayesian allocation
- Liquidity
 - trading costs (fixed, execution, opportunity)
 - implementation shortfall: temporary vs permanent impact
 - optimal execution of one-security trades
 - trading portfolios: the multivariate case