



# Portfolio Construction And Asset Allocation

**Program Description:** This seminar is a three-day journey covering the latest trends in portfolio construction and asset allocation and putting them in context of 50 years of portfolio construction research. The approach of this course is top-down and practical, providing guidance for practitioners how to take their asset allocation activities one step further and delivering valuable insights for potential practical implementation of more advanced quantitative techniques. The program is designed to accommodate plenum discussions and features concept applications in six group exercises.

**Target Audience:** chief investment officers, quantitative analysts, investment committee members, senior management.

**Materials:** Participants will receive a binder with the slides presented and access to spreadsheets containing example calculations for all models and concepts discussed.

The content of this program can be combined with content from other programs for customized **inhouse training** purposes. Please contact [email@andreassteiner.net](mailto:email@andreassteiner.net) for details.

Information relating to **scheduling, course venues and pricing** for the public courses is available on [www.andreassteiner.net/consulting](http://www.andreassteiner.net/consulting)

## Day One

### Welcome and Introduction

- Contemporary Challenges
  - Financial Crisis of 2008
  - Low-Yield Environment
  - Coronavirus Pandemic of 2020

### Review of Modern Portfolio Theory (MPT) & Going Beyond MPT

- From Mean-Variance Optimization to the CAPM
  - Applications of MPT
  - Active Management
  - Liability-Aware Portfolio Construction
  - Asset Class Investing
  - “Passive” Investing
  - Core-Satellite Approaches
- Critical Assessment and Constructive Take-Aways from MPT
- Framework for Going “Beyond MPT”



- The case for adaptive asset allocation in a dynamic World which is hard to forecast
- The latest industry trends: Factor Investing and Smart Beta

**Exercise:** a practical approach to take into account factor information in portfolio construction

## Expected Returns

- The importance of expected return in portfolio construction and challenges: estimation risk
- Do optimizers need expected returns? Spoiler alert: no, they don't
- Approaches to forecasting expected returns
  - Scenario-based methods
  - Deriving returns from scores and ranks
  - Building allocations from scores and ranks without optimizers
  - Incorporating active views: relative forecasts
  - Bayesian methods: the Black/Litterman model and noise filtering using shrinkage methods

**Exercise:** developing a basic scenario-based approach to tactical asset allocation based on macroeconomic indicators

## Day Two

### Risk-Based Investment Strategies & Estimating Risk

- Risk-based approaches to investing: minimum variance, risk parity, risk budgeting, equal-weighting, maximum diversification
- Drivers of success of risk-based strategies
- Time-varying risk characteristics, empirical risk anomalies
  - Autocorrelation and volatility clustering, GARCH models
  - The positive relationship between equity risk and return over time
  - The relative importance of volatilities and correlations
- Estimation of the covariance matrix
  - Sample covariances, EWMA and GARCH estimators
  - Bayesian shrinkage estimators
  - Filtering noise in covariances: Random Matrix Theory
  - Modelling and tweaking correlations: consistency issues & solutions, correlation scenarios and stress testing

**Exercise:** developing a quantitative volatility trading strategy and potential applications for tactical asset allocation



## Estimation Risk and Estimation Risk Management

- Estimation risk as risk in input parameters
- A scenario-based approach to estimation risk management
- The stochastic nature of efficient frontiers: confidence bands, the Resampled Efficient Frontier™
- Distortions in risk and return estimates: the impact of liquidity and survival biases, statistical unsmoothing approaches, evidence-based multiplier approaches
- Portfolio Optimisation: Markowitz
- Robust portfolio construction: modelling uncertainty, regret minimization

**Exercise:** developing a quantitative volatility trading strategy and potential applications for tactical asset allocation

## Day Three

### Portfolio Construction Beyond Mean and Variance

- Risk measurement for non-normal assets: LPM/UPM, VaR/CVaR, Drawdown risk
- Higher Moments: interpretation, uses and challenges
- Behavioural portfolio construction: implementing insights from Prospect Theory
- CVaR and LPM optimization: exact methods and approximations
- Understanding optimization algorithms: threshold accepting, simulated annealing, evolutionary methods, random portfolios
- Multi-criteria optimization: case study calculating sustainability-efficient portfolios and frontiers

**Exercise:** developing a quantitative volatility trading strategy and potential applications for tactical asset allocation

### Tail Risk Management

- The normal distribution assumptions in Finance
- Interesting non-normal distributions: non-normal mixture, NIG and Cornish-Fischer distributions
- Non-Normal Risk Budgeting based on Modified VaR/CVaR
- Building non-normal portfolios from elliptical distributions
- Drawdown Risk Management: CPPI 2.0

### Diversification in a Non-Normal and Non-Linear World

- Diversification is more than correlation: overdiversification, diworsification



- Taking into account correlation asymmetries in portfolio construction: a closer look at equities, bonds and gold
- Non-linear correlation measures and their limitations: the case of the Spearman rank correlation coefficient
- Introduction to Copula Theory: potential and current limitations

**Exercise:** Extracting bivariate copulas from time series data for non-PhDs

### Model Risk Management for Investment Management

- Forecast risk equals model risk plus estimation risk
- Approaches to managing model risk of investment portfolios: from practical approaches to introducing model risk policies
- Beware: Illusion of control

### Summary & Outlook