Strategic Asset Allocation in Practice

Ken Nyholm
Risk Management Division
European Central Bank

COURSE DESCRIPTION: This course will treat "strategic asset allocation" from a practical point of view. It will show how financial and econometric tools can be used to help designing investment strategies for longer time-horizons. We will see how econometric techniques such as vector autoregressive models and regime switching models can be used to generate return projections for financial instruments, how business cycle dynamics can be integrated into the investment framework and how financial models such as the Capital Asset Pricing Model (CAPM) can be used to derive optimal asset allocations.

During the course we will see many hands-on examples and practical model implementations, however, the theoretical foundations for the used modelling frameworks will also the treated to some extend. The course falls is three parts: Section 1 refreshes matrix algebra and describes the econometric building blocks needed. Section 2 outlines the main financial models used and Section 3 completes the course by combining sections 1 and 2 to show how these tools can form the foundation for strategic asset allocation decisions.

COURSE PREREQUISITES: Students are expected to have basic knowledge of econometric techniques and matrix algebra, although the course will offer a refresher of these topics. Also, students are expected to have some familiarity with financial market basics, financial models such as the CAPM and arbitrage pricing theory as well as interest rate models. However, aided by the applied nature of the course, all topics will be introduced from a basic and intuitive level, so the prerequisites are minimal. Prior knowledge of an econometric programming language will be an advantage (e.g. Matlab, Ox, Gauss or the like: Matlab will be used in the teaching).

COURSE REQUIREMENTS:

(i) Classroom participation [30% of the final grade].
(ii) Take-home examination [70% of the final grade].

COURSE OUTLINE AND TENTATIVE LITERATURE:

Section 1: Econometrics

a) Introduction to Matlab
b) Refresher on matrix algebra
c) A smorgasbord of econometric techniques:
- Autoregressive-moving average time-series models
- Regime shift models
- Kalman filter with and without regime shifts

Section 2: Financial Building blocks

a) Fixed income mathematics and yield curve models

b) Asset pricing models (CAPM, APT)
c) Market and Credit Risk Measures

Section 3: Strategic asset allocation

a) Overview of the investment process in Investment Houses
   - Strategic and tactical asset allocation
   - Trading strategies
   - In-house organisation and delegation of responsibilities
b) Long Term Investors
   - Investment objectives
   - Investment constraints
   - Utility functions
c) The Strategic Asset Allocation Process in Detail
   - The design of the investment process
   - Which econometric and financial tools to use?
   - Asset allocation case studies

TENTATIVE LITERATURE:

Detailed lecture notes and handouts will be produced by the lecturer for each of the above mentioned sections. These lecture notes will draw on well established financial and econometric textbooks and will in addition contain information on the practical application of the treated tools and models. A limited number of articles will also be used in the teaching. When teaching commences a list of recommended supplemental literature will be distributed.

TEACHING FORMAT: The teaching language is English. Classroom teaching will consist of a combination of lectures and computer-aided examples and exercises. It is expected that student participate actively during class and meet well prepared. The time distribution between the three sections is as follows: Section 1: 3x90 minutes; Section 2: 4x90 minutes; and Section 5x90 minutes.