1 Background and Goals

This class will take the technology from *Continuous-Time Finance* and put it to practice in asset pricing. We will take a close look at portfolio allocation, starting from the historical Merton problem, and focus thereafter in particular on trading strategies involving derivatives. We will also try to bridge representative-agent structural models with the no-arbitrage paradigm. The main workhorse for model-based questions will be the class of multivariate affine models.

2 Technical Skills Taught and Literature

The course will start out with developing an understanding for the construction and use of affine models. Almost all problems in finance that enjoy a certain tractability are built on this model class, from utility maximization to option pricing. From there we will have the tools to explore much more easily our asset pricing problems. The course will also cover certain MCMC methods for estimating state-space models which typically arise in finance.

There is no main textbook for this course. We will occasionally use Björk (1998), Brigo and Mercurio (2006), Øksendahl (2000), but we will draw predominantly from the papers listed below.

3 Topics in More Detail

Some of the below topics you will already have (partly) covered in previous courses. In that case we will spend comparably little time on them. I will also take the liberty to include and exclude topics as we go along.

- Affine models
– Construction
– Modeling
– Density expansions

• Portfolio Allocation
  – The Merton problem
  – Trading strategies involving derivatives
  – Parameter learning

• No-arbitrage and structural modeling
  – Utility maximization in continuous time
  – Stochastic Differential Utility (SDU)
  – Asymmetric information

• Estimation
  – Bayesian likelihood-based inference
  – MCMC methods

4 Grading

There will be a take-home exam with topics provided by me.

References


