Financial Data Analysis

Instructor: Professor Dr. Roman Liesenfeld

Date: Monday, October 13 through Thursday October 17, 2008: 10.15-11.45 a.m., 12:15 a.m. - 1:45 p.m., 2:15 – 3:45 p.m.

Prerequisites: Basics of Statistics and Econometrics

Course Syllabus: This course is designed to introduce statistical tools used in empirical research of financial data. In a accompanying tutorial students will apply these tools to real and simulated financial data sets using the software package EVIEW.

Course Language: English

Methods of Assessment: written exam

Course content:

1. Introduction
   (CLM97: Chap 1; T05: Chap 1,2 )
   1.1 Asset Returns and Their Properties
   1.2 Quick Review of Linear Univariate Time Series Models
       Stationarity, ACF, White Noise, AR-/MA-/ARMA-models

2. Forecasting Asset Returns and Market Efficiency
   (CLM97: Chap 2)
   2.1 Martingale
   2.2 Random Walk Hypotheses
   2.3 Tests for Random Walks I
       Cowles-Jones Statistic, Run-Tests
   2.4 Tests for Random Walks III
       Autocorrelation tests, Box-Pierce Test, Variance-Ratio-Test
   2.5 Test for Long-Range Dependence
       Models for Long-Range Dependence, Fractionally integrated process, Hurst-Mandelbrot
       Rescaled Range (B96)

3. Volatility Models for Return Series
   (T05: Chap 3; E01)
   3.1 ARCH-Models
3.1.1 Specification and Properties
3.1.2 Estimation of ARCH-models
   Model checking, Example

3.2 GARCH-Models
3.2.1 Specification and Properties
3.2.2 Estimation of GARCH-models
   Example

3.3 Stochastic Volatility Models
3.3.1 Specification and Properties
3.3.2 Generalized-Moment of moments estimation
   Likelihood function, GMM implementation, Example
3.3.3 Markov Chain Monte Carlo (MCMC) estimation (T02: Chap 10)
   Elements of Bayesian inference, MCintegration, Markov chain simulation, Markov-process, Gibbs sampling, conjugate priors, MCMC implementation

4. Market Mikrostructure and High-Frequency Data
   (CLM97: Chap 3; T05: Chap 5)
   4.1 Bid-Ask Spread
   4.2 Modelling Transaction Price Changes
      Ordered Probit, ML-estimation, Example
   4.3 Duration models
      ACD

Reading List

**General Textbooks**


