The International College of Economics and Finance

Syllabus (preliminary)
“Econometrics II (Financial Econometrics)”

Lecturer: Gelman S. V.
Class Teacher: Gelman S. V.

Course Description

Financial Econometrics is a one-semester course taught to the second years students of the ICEF Master programme in Financial Economics. It is designed to cover essential tools for working with financial data, including the return forecasting, volatility and econometrics of asset pricing, such as testing the market models. We focus on the empirical techniques which are mostly used in the analysis of financial markets and how they are applied to actual data.

The course starts with the overview of financial data. It covers the event-study methodology, and continues with testing market models (Fama-McBeth regressions, etc) and stochastic discount factor models. We then proceed to analyzing return predictability, volatility effects of the market data (asymmetric GARCH), and market interdependence. A special attention is paid to non-linear models, from basic threshold formulations to more advanced techniques like Markov switching model and Kalman filter. All the models are accompanied with real-data examples in standard computer packages.

Course prerequisites:
Financial Economics I (Asset pricing), Econometrics I.

Teaching Objectives

Upon completion of the course students will be able to

• use event-study methodology in applied research
• test the standard asset pricing models
• investigate market interdependence (in the mean and variance equations)
• estimate non-linear models
• forecast financial data using high-level econometric techniques and measure their effectiveness

Teaching Methods

The following teaching methods are used:

• lectures (2 hours per week)
• classes (2 hours each second week, at least half of which is computer-based)
• home assignments
• lecturer’s consultations
• self-study

Overall, the course includes 32 lecture hours and 16 class hours.
Grade determination

Final grade is determined on the following basis:

- home assignments (10%)
- class participation (10%)
- midterm (20%)
- final exam (60%)

Main Reading


All the journal articles for the corresponding topics are listed in the Course Outline. Useful internet links for particular topics will be given in class.

Additional Reading


Course Outline

1. Financial data
   Stylized facts of the financial markets data, major characteristics and puzzles, sources and types of data, links to discussed time series models.
   **Reading:**
   - CLM: Ch. 1
   - RT: Ch. 1

2. Event-study methodology
   Abnormal returns, tests on abnormal returns, cross-sectional approach.
   **Reading:**
   - CLM: Ch. 4

3. Testing return predictability
   Technical trading rules, measures of return predictability, review of test of forecasting power and bootstrap.
Reading:

- CLM: Ch. 2-3

4. GARCH
GARCH, IGARCH in risk management, GARCH-M.

Reading:


5. Asymmetric GARCH effects
Tests on GARCH asymmetry, EGARCH, TGARCH.

Reading:

6. **Testing market interdependence**
   Review of VAR/VECM models, Granger causality, multivariate GARCH.
   **Reading:**
   - RT: Ch. 8, 10
   - WE: Ch. 5

7. **Testing asset pricing models: Fama-MacBeth regressions**
   Fama-MacBeth procedure, basic Fama-McBeth regressions, Shanken correction, GRS test, GMM approach.
   **Reading:**
   - CLM: Ch. 5-6
   - RT: Ch. 9
   - JC: Ch. 12, 14

8. **Testing asset pricing models: GMM**
   Review of stochastic discount models, factor-based models, GMM estimator.
   **Reading:**
   - JC: Ch. 10-11, 13, 15-16

9. **Introduction to non-linear econometric models**
   Bilinear models, piecewise linear models, TAR, STAR, SETAR and their application.
   **Reading:**
   • CLM: Ch. 12
   • RT: Ch. 4, 10

10. **Markov switching model (time permitting)**
    Formulation of Markov switching model, properties, estimation, filtered and smoothed probabilities.
    **Reading:**
    • RT: Ch. 4, 10

11. **Kalman filter (time permitting)**
    State-space formulation, standard econometric model in state-space formulation, estimation, application to market models.
    **Reading:**
    • RT: Ch. 4, 10
    • Meinhold, R. J. and Singpurwalla, N. D. 1983, “Understanding the Kalman Filter. The American Statistician, 37, 123-127