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The Johns Hopkins University MA Program in Applied Economics

FINANCIAL ECONOMETRICS (440.647.51)

Spring 2008

Instructor:

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Class Meetings: Mondays 6:00 – 8:45 pm

Inquires: Please e-mail me whenever you have any question. I will set aside some time each weekday morning (except Monday morning) to answer mail. I could also meet students by appointment and informally during class breaks.

Prerequisites

Microeconomics and Econometrics and any course in Finance taken anywhere.

Content

This course introduces students to the methods most commonly used in empirical finance. The analysis of different financial markets and instruments will be discussed, as well as how to handle different data frequencies (tic, hourly, daily, weekly, monthly data). Key models and methods: ARCH, GMM, Regime-Switching Models. Prediction of risk and returns; test of CAPM (Capital Asset Pricing Model), stock market prices, derivatives (exchange rates, forwards, options, swaps), term structure models, volatility models (implied, stochastic volatility), and elementary microstructure.

Objective

The students will learn aspects of time series econometrics for both stationary and non-stationary variables at different time frequencies, with emphasis on financial variables. They will be able to understand and analyse the most important aspects of financial markets.

Forms of teaching

The course is mostly lecture style with some discussion of related academic articles whenever is possible.

Lectures build cumulatively on each other. To get the best of the course, read the required readings and the lectures notes constantly, since they are foundations for future lectures.

Regarding the *Computer Software*, the students can use any econometric software of their preference but that can handle ARCH estimation, GMM estimation, and Regime Switching, and the other empirical models taught in class.

Textbooks:

Required book

- Selected chapters from “**Asset Price Dynamics, Volatility, and Prediction** by **Stephan J. Taylor**, 2007, Princeton University Press.

Other additional books (not required) on Financial Econometrics and related topics

- **Greene, W.H.:** *Econometric Analysis*, 5th edition. Prentice-Hall, 2003.
- **Mills, T.C.** (1999): *The Econometric modelling of financial time series*. Cambridge University Press.
- **Campbell, J.Y., Lo, A.W., and MacKinley, A.C.** (1997): *The econometrics of financial markets*. Princeton University Press.
- **Franses, P.H., and van Dijk, D.** (2000): *Non-Linear Time Series Models in Empirical Finance*. Cambridge University Press.
- **Cuthbertson, K.** (1996): *Quantitative Financial Economics. Stocks, Bonds and Foreign Exchange*. Wiley.

Examination form and Grading

There will be two compulsory term papers, and three problem sets where the students will apply the econometric modelling taught in class. Each problem set will count for 10% of the final grade. Each of the term papers will count for 35% of the final grade. For the first term paper, students need to *choose a published article* in an academic journal, summarize the article, replicate the results, and write a presentation of the work. The second term paper will require that students *choose a topic of his/her interest*, do the empirical work using the adequate dataset, and have a written presentation of the work. You need to discuss with me as early as possible about the topic and data you choose for your term paper. See below for Guidelines.

Additional information

- Whenever is possible, the Lecture Notes will be made available at WebCT.
- It is strongly recommended that the students attend the lectures. **IMPORTANT:** Read the corresponding bibliography before you come to classes in order to get at least familiar with some terminology and notation.

Topics of the course

The main topics to be discussed in the lectures are (subject to change):

1. Overview. *January 28th, 2008*
2. Sampling frequency. Autocorrelation and cross correlation. Stylized facts for Financial Returns. *January 28th, 2008*
3. Capital Asset Pricing Model (CAPM). *February 4th and 11th, 2008*
4. Non-linear autoregressive models for high-frequent data: ARCH, GARCH. *February 18th and 25th, 2008*
5. Generalized method of moment (GMM) and Intertemporal models. *March 3rd and 10th, 2008*
6. Stochastic volatility models. *March 24th, 2008*
7. Qualitative factor model and Regime switching. *March 31st and April 7th, 2008*
8. Present value model and Expectation Hypothesis. *April 14th, 2008.*
9. Analysis based on the Black-Scholes model. Implied volatility, *April 21st and 28th, 2008.*
10. Dynamic models of high-frequency data. Market microstructure. *May 5th, 2008.*

Guidelines for Term Papers

First Term Paper

*Deadline for handing in the First Term Paper: **March 24th, 2008***

Students need to choose an article that considers the econometric models we study in class, and that the data is publicly available. To find relevant articles, visit for example <http://www.sciencedirect.com/>, and browse under “Economics, Econometrics and Finance”, or <http://www.jstor.org/browse> and browse under “Finance”, to look for relevant articles. By **February 25th, 2008 (or earlier)**, students must hand in a hard copy of the article you want to analyze.

The paper should be of **only 3-5 pages**.

Second Term Paper

*Deadline for handing in the Second Term Paper: **May 5th, 2008***

By **April 21st, 2008**, students must hand in a brief (1/2 page) description of their second term paper.

The paper should be of **only 4-7 pages**.

Contents of the term papers

- Introduction: The problem you study and your main results
- Explanation of the economic theory behind the empirical model
- The data and empirical model used
- Your results (hand in the computer output as well)
- Conclusions: What you learned from the work and suggestions for further research.