

# Financial Econometrics

## FALL 2014

### **DRAFT SYLLABUS**

**Financial Econometrics**  
**Fall 2014**  
**Tuesday: 3:00 to 5:50 pm**

**Professor Robert F. Engle**  
**FINC-GB.4388.01**  
**KMC 9-191, Gruber Conference Room**

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**Course Description:** The course is designed to introduce the econometric tools most used in finance and to gain understanding of the sources and characteristics of financial data as well as current and classic applications.

Each week there will be a **Paper of the Week**. Each student will bring to class a page with two observations on the paper. Each should only be a few lines. To help prepare, two students will present the paper to the rest of the class at a Friday lab. The Friday lab will also teach computational skills needed for the upcoming homework assignments.

We will use **Datastream, WRDS, CRSP, Yahoo Finance**, or other vendors as a source for financial data, and **EViews** software to build ARCH and other time series models. There will be 3 homework assignments including a short *research paper*. The homework assignments will include computer exercises which will be developed in Friday lab and then presented in class. **EViews** is available in the computer lab and on CITRIX, but I recommend that you buy a copy or upgrade to the latest version which has ARCH software as well as GMM, cointegration and lots of available algorithms.

There will be a two part final exam. There will be a closed book short answer in-class exam and then a more research oriented take home part.

This course presumes familiarity with finance as well as a course in graduate econometrics. Ideal preparation is Econometrics I and Finance Theory I.

**Time: Tuesday 3:00-5:50 pm**

**Office Hours: Monday 3:00–5:00 pm or by appointment**

**Laboratory: Friday 11:00 am-12:00 pm, KMC 4-90**

#### **GRADING:**

40% Homework  
25% Short Answer Exam  
25% Take Home Exam  
10% Classroom Participation

Class	Date	Topic
1.	9/2	Volatility: Data, Models, Risk <ul style="list-style-type: none"> <li>• Homework 1 Assigned: VLAB, EViews, GARCH Models</li> <li>• Paper of the Week: "What Good is a Volatility Model", Engle and Patton, 2001</li> </ul>
2.	9/9	Econometrics of Volatility: MLE, QMLE, and Stochastic Processes <ul style="list-style-type: none"> <li>• Paper of the Week: "Quasi-Maximum Likelihood Estimation and Inference in Dynamic Models with Time Varying Covariances", Bollerslev and Wooldridge, 1992</li> </ul>
3.	9/16	Economics of Volatility: Asset Pricing and Spline GARCH <ul style="list-style-type: none"> <li>• Paper of the Week: "Expected Stock Returns and Volatility", French Schwert Stambaugh</li> </ul>
4.	9/22	Homework 1 Due: Submit assignment on course website by 11:55 PM
5.	9/23	Realized Volatility: Measures and Forecasts, the Multiplicative Error Model <ul style="list-style-type: none"> <li>• Paper of the Week: "Modeling and Forecasting Realized Volatility", Andersen, Bollerslev, Diebold, Labys, 2003</li> <li>• Homework 1 Due: Bring hard copy to class</li> </ul>
6.	9/30	No Class
7.	10/7	Microstructure Data and Models with irregularly spaced data <ul style="list-style-type: none"> <li>• Homework 2 Assigned: Asymmetric Volatility</li> <li>• Paper of the Week: "The Econometrics of Ultra-High Frequency Data" Engle 2000</li> </ul>
8.	10/14	Options and Implied Volatility <ul style="list-style-type: none"> <li>• Paper of the Week: "Crash-O-Phobia: A Domestic Fear or a Worldwide Concern?", Foresi, Wu 2005</li> </ul>
9.	10/20	Homework 2 Due: Submit assignment on course website by 11:55 PM
10.	10/21	Extreme Value Distribution and Quantile Estimation <ul style="list-style-type: none"> <li>• Homework 2 Due: Bring hard copy to class</li> <li>• Paper of the Week: "Value at Risk Prediction: A Comparison of Alternative Strategies", Kuester, Mittnik, Paoletta, 2006</li> </ul>
11.	10/28	Copula and Tail Dependence <ul style="list-style-type: none"> <li>• Homework 3: Short Research Paper Assigned</li> <li>• Paper of the Week: "Modelling Dependence in High Dimensions with Factor Copulas", Patton and Oh, 2012</li> </ul>
12.	11/4	Dynamic Conditional Correlation and Multivariate GARCH <ul style="list-style-type: none"> <li>• Paper of the Week: "International Stock Return Comovements", Bekaert Hodrick and Zhang, 2009</li> <li>• And "Is the Potential for International Diversification Disappearing? A Dynamic Copula Approach," Christoffersen, Errunza, Jacobs, Langlois, 2012</li> </ul>

13. 11/7                    **(Make-up Class, 1:30 – 4:20 pm)** DECO and Factor Spline GARCH
- Paper of the Week: “Factor Spline Garch Model for High and Low Frequency Correlations”, Rangel and Engle, 2012
14. 11/11                    Asset Pricing, Fama and French, Bali and Engle, Llewellen and Nagel
- Paper of the Week: “Dynamic Conditional Beta is Alive and Well in the Cross-Section of Daily Stock Returns”, Bali, Engle, Tang, 2012
15. 11/18                    Systemic Risk, CoVaR, MES and Stress Tests
- Paper of the Week: “Capital Shortfall: A New Approach to Ranking and Regulating systemic Risks”, Acharya, Engle, Richardson 2012
  - Homework 3 Research Paper Due
16. 11/25                    No Class
17. 12/2                    In class: **Short Answer Exam**
- Take home exam begins
18. 12/4                    **Take Home Exam Due**

## REFERENCES

### BOOKS \*\*\*\*\*

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2. McNeil, Alexander, Rudiger Frey and Paul Embrechts,(2005) **QUANTITATIVE RISK MANAGEMENT**, Princeton University Press
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### JOURNAL ARTICLES\*\*\*\*\*

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27. Engle, Robert F. (2012), "Dynamic Conditional Beta" (June 13, 2012)
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