NATIONAL TAIWAN UNIVERSITY
Department of Finance

Financial Econometric Methods and Applications

Prof. C.-M. Kuan   **Spring 2010**
Room 716, Bldg. 2   **ckuan@ntu.edu.tw**

This course is to prepare students with econometric methods that are readily applied in finance and economics research. The prerequisite is one year graduate econometrics training (such as two core courses at Ph.D. or Master level) or equivalent. There are two parts of this course. In the first part, I will discuss various issues in modeling, estimation, and testing for univariate and multivariate time series. In particular, both models for conditional mean and conditional variance will be studied. In the second part I will introduce some econometrics methods, including bootstrapping and quantile regression, that are applicable to both time series and cross section data. Instead of providing "recipes" for these methods, I will try to make it clear why these methods work and present related empirical applications.

All lectures will be given in English. There will be homework problems, including computation exercises. Students are expected to learn at least one programming language (R, Gauss, or matlab). A short term paper and presentation at the end of this semester are also required for those who take this course. Auditors are welcome only if they also do the required homeworks and actively participate classroom discussion.

Reading

1. Hamilton, J., *Time Series Analysis*, Princeton, NJ: Princeton University Press, 1994.

2. Kim, C.-J. and C. R. Nelson, *State-Space Models with Regime Switching*, Cambridge, MA: MIT Press, 1999.

3. Koenker, R., *Quantile Regression*, New York, NY: Cambridge University Press, 2005.

4. Lecture notes, available at **ceiba.ntu.edu.tw/982efe** or **homepage.ntu.edu.tw/~ckuan**; please constantly check for new versions.

5. Tsay, R. S., *Analysis of Financial Time Series*, 2nd ed., New York, NY: Wiley, 2005.

Supplemental Reading

1. Campbell, J. Y., A. W. Lo and A. C. MacKinlay, *The Econometrics of Financial Market*, Princeton, NJ: Princeton University Press, 1997.

2. Lütkepohl, H., *Introduction to Multiple Time Series Analysis*, 2nd edition, Berlin: Springer-Verlag, 1993.

3. Taylor, S. J., *Asset Price Dynamics, Volatility, and Prediction*, Princeton, NJ: Princeton University Press, 2005

Course Outline

  I. Time Series Models

      1. Basic concepts

      2. Stationary and invertible ARMA processes

      3. Vector AR processes

      4. Box-Jenkins approach

      5. Diagnostic tests

      6. Tests of unit root

      7. Co-integration and error correction models

      8. Volatility models

      9. Markov switching models

     10. Realized volatility

  II. Bootstrap and Tests of Inequality Constraints

      1. Bootstrap

      2. Asymptotic properties

      3. Different bootstrap methods

      4. Applications: Predictability of technical trading rules and term spread models

 III. Quantile Regressions and quantile treatment effects

      1. Conditional quantiles

      2. Estimation

      3. Large sample tests

      4. Instrumental variable estimation

      5. Quantile treatment effects

      6. Applications: Return-volume relations and effects of NHI on saving

Office Hours: Wednesday 3–5 or by appointment.

Grading

1. The grade is determined by homework assignments (25%), a term paper (50%) and paper presentation (25%).

2. The term paper may be a short review of some econometric methods or an empirical study of finance or economic variables. The term paper may be done jointly by **no more than 2** students. If there are two co-authors, both must do the presentation together. The guidelines for the term paper and presentation will be distributed shortly.