Econometrics III: Time Series Analysis

Course Description:
This course focuses on the advanced methods and tools to analyze time series in finance and macroeconomics. We will apply these methods and tools to study various macro-finance models. The students are expected to understand and solve problems in estimating and testing different models in finance and macroeconomics.

The prerequisite for this course is intermediate-level courses in finance (introductory asset pricing) and econometrics (for example, Econometrics Analysis by William Greene).

Time and Location:
Time: Fridays 13:00-15:45 pm
Location: Xin Shang Yuan S303

Office Hour/Homework/Grading:
The most efficient way to contact me is by email, and I will usually reply in 24 hours. Office hour is available by appointment. My email address is nanli@sjtu.edu.cn. My office is in Antai College of Economics and Management, B705.

There will be homework and final exam. You are also required to write a referee report and give a 30-minutes presentation of a research paper of your choice within the pool of required readings (part II). The final grade is based on the weighted average of the homework, presentation, referee report and final exam grades. The following weighting schemes will determine your final grade for the course:

- Homework: 30%
- Presentation and Referee Report: 20%
- Final Exam: 50%

You are encourage to discuss homework in groups, but each one of you must hand in a copy of homework separately. For empirical parts of the homework, do NOT submit your program codes or raw data, please submit the final results of your computation with explanation. No late submission of homework will be accepted.

Class Presentation and Referee report:
Each student must sign up to do a 30-minute class presentation of a paper. You should hand out copies of your slides before the presentation. In addition a referee report for the paper you resented will be due by the end of the semester. The referee report should be no more than 10 pages with at least 11pt Time New Roman Font and 1.5 line spacing.

Warning:
- Plagiarism is taken very seriously. Students had been caught plagiarizing in class assignments, term paper, and/or quizzes in this course have been severely penalized. Any student caught cheating in any class assignments, term paper, and/or exams will be failed in this course and reported to the school for further penalty.
• If a student is absent from the exam or late for more than 30 minutes without any medical certificate or other verifiable excuses (subject to the approval of lecturer), there will be no make-up exam and the grade will be counted as zero.

**Textbooks and References:**

- **Require textbooks and manuscripts:**

- **Recommended textbooks:**
  3. *Lectures in Quantitative Economics* by Thomas J. Sargent and John Stachurski

- For the tips on preparation of presentation and writing papers
  o Cochrane, J. (2005) [Writing tips for PhD students](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/)

**Useful websites for data and programming**

- [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/)
- [http://wrds.wharton.upenn.edu](http://wrds.wharton.upenn.edu)
- [http://www.bea.gov/beahome.html](http://www.bea.gov/beahome.html)
Reading List and Class Schedule (tentative and subject to changes):

Part I: Time Series Analysis
1. ARMA Models, Autocorrelation, Prediction and Impulse-Response Functions
   - TSMF Chapter 1-5
   - TSA Chapter 3-5

2. Wold representation, VAR and Kalman Filter
   - TSMF Chapter 6-7
   - TSA Chapter 11

3. Spectral Analysis
   - TSMF Chapter 8
   - TSA Chapter 3, 6

4. Unit Root and Cointegration
   - TSMF Chapter 10, 11
   - TSA Chapter 17, 18, 19.

5. **GMM**
   • TSMF Chapter 14
   • AP Part II Chapter 10-16.

**Part II: Empirical Analysis of Asset Pricing Models**

1. **Return predictability and Time Variation in Risk Premia**
   • FMRE Part 2
   • AP Chapter 20.1 p. 389-435

2. **Cross-Sectional Variation in Risk Premia**
   1) Incomplete Market and Idiosyncratic Risk
   2) Transaction Costs and Liquidity
   3) Short-Sale Constraints and Borrowing Constraints
   • AP, Ch. 20.2 p. 435-454.
   • Asness, Cliff, Toby Moskowitz and Lasse Pedersen, June 2009, "Value and Momentum Everywhere” Manuscript, University of Chicago.
• Chordia, Tarun, Avanidhar Subrahmanyam, and Qing Tong, 2014, Have capital market anomalies attenuated in the recent era of high liquidity and trading activity?, *Journal of Accounting and Economics* 58, 41–58.


3. Equity Premium and Consumption-Based Models

• AP, Ch 1 20-22; Ch. 21.1 455-465

• FMRE, part 3 p. 257-266,


4. Production Based Asset Pricing and Investment Models

• Cochrane, John H., Financial Markets and the Real Economy p290-302


• Cochrane, John H. 1988, Production-Based Asset Pricing, NBER working paper 2776.

5. **Uncertainty and Long-Run Risk**
A Brief Guide for Writing Your Report as a Referee

Your report should not normally exceed 10 pages of A4 paper. Since you read papers from the journals, you may wish to choose one of these as a starting point. In your report as a referee you should consider the following issues.

1) How important is the question addressed in your chosen paper?

2) How important/interesting are the results which have been obtained in this area? When assessing this, consider the importance of the paper for financial economists in general.

3) How well are the conclusions of the paper supported? In particular:

- Are there any additional tests of the model/conclusions that should have, or could have reasonably been made to support the conclusions? (If it really is essential to make very extensive additions to the paper this is unlikely to be practical and therefore the paper would usually be rejected.)
- Are the data/conclusions internally consistent and consistent with other reports in the literature? If not, is there a concern about the present data and have the authors discussed plausible reasons for the discrepancy?
- Are the assumptions made likely to be valid? Should the authors perform additional checks?

You are free to decide on the format of a referee's report. However, there is often a first paragraph which summarizes the paper’s conclusions, methods and significance (in the view of the referee). Often the strengths of the paper are highlighted here. This is then followed by a series of points detailing the possible concerns about the methods or conclusions. For the paper you cannot make some useful suggestions, you may want to present the results in the extended periods and see if there is any change in the results.