Econometrics III

ECON 6343 (Spring 2019)

TIME: TUESDAYS AND THURSDAYS 9:00 - 10:15 AM
ROOM: Physical Science Ctr, 0228

Instructor: Kim, Jaeho
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Office hours: Tuesdays and Thursdays 4:00-5:00 pm

Required Textbook:


The required text books are enough for our discussion. Additional materials used in class will be posted in our class website. ( ozone.ou.edu )

Optional Textbook:


Course Description:

Econometric III is an advanced time series course to learn various statistical models and techniques used to investigate economic time series data. Time series analysis is an indispensable ingredient in economic research in that it helps to understand important dynamic patterns and causal relationships in actual economic data. The goals of the course are threefold: (1) develop a comprehensive set of tools to analyze various forms of univariate and multivariate time series; (2) learn how to use STATA, and MATLAB to estimate time series models; (3) survey some of the current research topics in time series econometrics and develop your own research topic.

The first block of the course presents the intensive theory of univariate stationary and non-
stationary time series variables. The second block covers multivariate time series issues such as VAR models, and cointegration with a special focus on financial and economic applications. The third block of the course deals with State-space models and Kalman Filter (ARIMA models, Time-varying parameter models, Unobserved Component model, Dynamic Factor models, and Markov-Switching models,….) The last block consists of some advanced topics recently popular in time series econometrics.

**Prerequisites:**
A good grasp of basic mathematical statistics and linear algebra is necessary for this course. I will assume everyone has taken the first year econometrics sequence.

**Grading Policy:**
There will be several homework, and two exams for this course. Homework will be passed out every two weeks approximately. *Every student must submit a complete research papers by May 10. For the last week of this semester, some selected students will present their works in class. You should get started with your project as soon as possible. Do not wait until the last minute.* Your final grade will be calculated in the following manner:

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(100\% = \text{Midterm exam } 30\% + \text{Final exam } 30\% + \text{Independent Research } 30\% + \text{homework } 10\%)
\]

**Exams:**
Each exam will count for 30% of your grade, respectively. They are not cumulative. Each exam will be about 1 and half hour in length and are closed book. There is no make-up exam for midterm exam. (If you already know that you cannot take midterm exam, you will not be able to take this class.) If you could not take final exam for an avoidable situation, one more chance will be given with an official document to prove it. If you are not in the condition to re-take the exam, 70% of the average of all the scores from homework, and the first exam will be given for the second exam with an official document.

**Midterm exam is scheduled on Thursday March 14, 2019, 09:00–10:15 AM, PHSC 228**

**Final exam is scheduled on Wednesday, May 08, 2018, 8:00–10:00 AM, PHSC 228**

**Independent Research:**
Your research paper should contain the following contents.

1. Introduction and Motivations for your research
2. The literature review
3. Econometric Models
4. Empirical Results
5. Economic implications
6. Summary and Conclusions
First, think about a researcgable and interesting economic problem. (To conduct your research, relevant data should be available.) It is good to find a topic worth investing your valuable time.

Second, search for similar studies. It is totally fine just to replicate the empirical results of the existing studies or update them by borrowing econometric models or using different data sets. But make sure to mention in your paper how you can make a marginal or significant contribution to the existing studies.

Third, do not try to be ambitious. As long as the implications in your paper economically make a sense, employing a simple time series model is totally fine. Always think about how to make an econometric model as simple as possible and avoid complicating models.

Homework:
Homework will be given out in class on particular Thursdays. They are meant as a guideline on how well you understand the material presented in class and in the textbook. To get a good grade from this course, you should be able to understand and solve all the problems in the homework. Note that basic STATA and Matlab skills will be required to complete the homework.

Tentative Course Schedule and References

1. Stationary Univariate Models:
   Stochastic Difference Equations, Wold Representation, Stationary, Properties or stationary processes in time domain, ARMA representation, the autocorrelation function, and Prediction Error Decomposition.
   • Lecture Note

2. Introduction to Univariate Nonstationary Time Series and Unit Root:
   • Lecture Note


3. Introduction to Stationary VAR Models:
Recursive VAR, Structural VAR models, Long-run and Short-run Restriction, and Multivariate Beveridge-Nelson decomposition.

• Lecture Note


4. Spurious Regression and Cointegration:
Spurious Regression, Cointegration and Error VAR model.

• Lecture Note


5. Structural Breaks:


6. State-Space Models and Kalman Filter:
State-Space Form, Kalman Filter, ARMA Models, Unobserved Component Models, Dynamic Factor Models

• Kim and Nelson: Chapter 3


7. Nonlinear Models:
Markov switching, Time-Varying Parameters

• Kim and Nelson Chapter 3-5


** Tentative Special Topics

Stochastic volatility and GARCH models:


**Large data sets: Dynamic Factor Models and FAVAR:**


**Endogenous Issues in Time-series:**


**Statistical Inference in Dynamic System Equations: Dynamic Stochastic General Equilibrium Models**