

**Econ 5150 Applied Econometrics
2018 Winter Term
The Chinese University of Hong Kong**

Instructor: Xu, Dinghai

Lecture: Wednesday 8:30 -11:15, ELB 305

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Course Web Page: Access through CUSIS

Course Description

The main goal of this course is to provide students (at the graduate level) with an econometric (statistical) foundation for pursuing applied and theoretical research in economics/finance. This course covers important concepts, models and estimation methods used in the empirical time series analysis. Refer to the topics section below for more details.

Students will be required to learn coding in at least one statistical software during the term in order to complete the required assignments (simulation based or empirical data based). It is expected that upon successful completion of this course, students should master basic skills to do empirical time series analysis on economic data.

Recommended Textbooks

[1] **Time Series Analysis [TSA], J. Hamilton, Princeton University Press**

[2] **Econometric Analysis [EA], W. H. Greene, Sixth Edition, NY, Macmillan.**

[3] **Statistics and Finance: an Introduction, D. Ruppert**

Journals: Econometrica, Journal of Econometrics, Journal Business and Economic Statistics, Journal of Financial Econometrics, Journal of Time Series Analysis, etc.

Topics

Statistics Review [Classnotes]

(Random variable, Expectation, Moments, Moment Generating Function, Distribution Theory, Linear Regression Models)

Preliminary Time Series Concepts [TSA: Chp. 2, Chp. 3]

(Deterministic and stochastic processes, basic concepts of Stationarity, Autocorrelation Function (ACF), Partial ACF (PACF), Ergodicity, Lag-Operator)

Linear Stationary Time Series Models [TSA: Chp. 3; EA: Chp. 19, 21]

(White Noise (WN) process, Autoregressive (AR) process, Moving Average (MA) process, mixed Autoregressive Moving Average (ARMA) process, Stationarity and invertibility conditions, Statistical properties and estimation strategy)

Non-Linear Time Series Modelling with Time-varying Volatility [TSA: Chp. 21; EA: Chp. 19]

(Autoregressive Conditional Heteroskedasticity (ARCH), Generalized ARCH (GARCH), Stochastic Volatility (SV) model, statistical properties, estimation procedures, empirical applications)

Multivariate Time Series [TSA: Chp. 10, Chp. 11]

(Vector Autoregressions (VAR), Vector Moving Average (VMA), Granger Causality, Maximum Likelihood Estimation (MLE) and Statistical Properties)

Non-Stationary Models for Time Series and Co-integration [TSA: Chp. 15, Chp. 16, Chp. 17, Chp 18, Chp. 19; EA: Chp. 22] (Time Permitted)

(Random Walk, Unit Roots, Dickey-Fuller Tests, Co-integration System and error correction)

Some related papers (empirical / theoretical) for each topic might be discussed in the class. If necessary, some introductions of Matlab software may be illustrated for applications.

Computing Software

There will be several problem sets which require using statistical software for completion. Feel free to use any computing package you prefer. But, I would suggest Matlab. If time allowed, I will do some numerical demonstrations in class.

Course Requirements

1. Assignments (3 sets) – 15%
2. Midterm exam – 30%
3. In-Class Presentation– 15%
4. Research Project – 40%

Notes:

1. Students are expected to do a 15-20 minutes presentation based on the term research projects. Only two formats of the slides are acceptable: pdf or ppt. The presentation should focus on your motivations and contributions of the project (either in empirical data analysis or theoretical model development) with a brief literature review. Regarding the term paper, there is no restriction on the number of pages. However, it should include the following components: Introduction, Model, Data analysis and Conclusion.
2. There will be a late midterm for this course. The date will be set and announced in class.
3. The due day for the research project is April 25th, 2018.

Honesty in Academic Work

Please visit the following website for details of university policy on Honesty in Academic Work: <http://www.cuhk.edu.hk/policy/academichonesty/>.