Course ID Number: ADC6526

Course Title: Time Series Analysis II

No. of Credits: 2

Graduate School of International Relations

International University of Japan

Term: Fall 2013

Instructor: Chun-Hung Kuo

Course Description:

The aim of the course is to provide students with an introduction of time series analyses. It will start with an overview of basic notions of time series analysis, and continues with univariate time series models. It will also cover tests for unit roots. Moreover, to evaluate the relations between several economic time series, we will study vector autoregressive (VAR) models. In dealing with the analysis of relations between non-stationary variables, we will resort to cointegration analysis. At the end of the course, we will discuss structural estimations of macroeconomic models by the Generalized Method of Moments (GMM). Upon completion of the course, students will have obtained the basic knowledge for conducting empirical research on related economics issues.

Time Series Analysis II

Fall 2013

General Information

Instructor:	Chun-Hung Kuo
Office:	Room 114
E-mail:	chkuo@iuj.ac.jp
Lectures:	TBA
Classroom:	TBA
Office Hours:	TBA

Course Descriptions and Objectives

The aim of the course is to provide students with an introduction of time series analyses. It will start with an overview of basic notions of time series analysis, and continues with univariate time series models. It will also cover tests for unit roots. Moreover, to evaluate the relations between several economic time series, we will study vector autoregressive (VAR) models. In dealing with the analysis of relations between non-stationary variables, we will resort to cointegration analysis. At the end of the course, we will discuss structural estimations of macroeconomic models by the Generalized Method of Moments (GMM). Upon completion of the course, students will have obtained the basic knowledge for conducting empirical research on related economics issues.

Prerequisites

Undergraduate level statistics and econometrics

Course Materials

The class lecture handouts will be the primary sources of information for this course. There is no required course textbook. However, the following books are good references:

- Walter Enders, *Applied Econometric Times Series*, 3rd Edition, Wiley, 2009
- James D. Hamilton, *Time Series Analysis*, Princeton University Press, 1994

Course Outline

- Difference Equations
  - General Introudtion of Time Series Analysis
  - Difference Equations and Their Solutions
  - Solution by Iteration
  - Lag Operators
- Stationary Time-Series Models
  - Stochastic Difference Equations
  - Stationarity
  - ARMA models
  - Box-Jenkins Model Selection
- Unit Root Econometrics
  - Unit Root Processes
  - Dicky-Fuller Test and Augmented Dicky-Fuller Test
  - Structural Change
- Multi-Equations Time-Series Models
  - Introduction of VAR Models
  - Estimation and Identification
  - Impulse Response Functions
  - Structural VAR Models
- Cointegration and Error-Correction Models
  - Cointegration and Common Trends
  - Cointegration and Error Correction
  - Testing for Cointegration
- Structural Estimation of Macroeconomic Models
  - Moment Conditions implied by the Macroeconomic Models
  - Asymptotic Properties of GMM Estimators
  - The Delta Method
  - Over-identification Tests

Problem Sets

There will be 3-4 problem sets in this course. The purpose of these problem sets is to help you understand the materials in class. The exams of the course are highly correlated with the problems sets. If you have a good understanding of the problem sets, you will have a higher chance to obtain a good grade. The problem sets contain both analytical and computational questions, and some of them will be challenging. I will not accept any late solution sets.

Assessments and Exams

There will be two exams, which is a midterm and a final term project. Your grades will be the weighting average of problem sets, the midterm exam, and the final term project. The following table summarizes the weights.

Problem Sets	15%
Midterm Exam	40%
Term Project	45%

This syllabus is tentative and may be subject to change as the course progresses.