

INTERNATIONAL UNIVERSITY OF JAPAN

Graduate School of International Relations

Academic Year: 2016/2017

Term: Spring

Course	Course code ADC6526	Course title Time Series Analysis	
Name of Instructor	Chun-Hung Kuo		Credit Number: 2
Instructor's contact Information	Office#: 327	Office Hours: 1:30pm-2:30pm, Wednesday	E-mail: chkuo@iuj.ac.jp
Class Schedule Day / Time	TBA		

Course Description:

The aim of the course is to provide students standard time series analysis tools for any empirical studies with the time dimension. The course will start with an overview of basic notions of time series analysis, and continues with univariate time series models. Then, this course steps into the territory of non-stationary time series and unit root tests. Moreover, to examine the potential relation between several economic variables over time, we will also discuss the vector autoregressive (VAR) models. The differences between reduce-form and structural VAR models and their implementation will be explained thoroughly. In dealing with the analysis of relations among non-stationary variables, this course introduces the co-integration analysis and error correction models. Upon completion of the course, students will have obtained the basic knowledge for conducting empirical research on related economics issues.

Learning Objectives:

The goals of this course are to understand the following concepts:

1. The properties of stationary time series
2. Deterministic trend and the ways of removing them
3. Seasonality
4. Autoregressive and moving average Models
5. Impulse response functions
6. Non-stationary time series and stochastic trend
7. (Reduce-form and Structural) Vector Autoregressive Models
8. Error Correction Model and Cointegration

Students are also expected to implement the above concepts in some statistic software such as Eviews and STATA.

Career Relevance:

The materials introduced in this course are fundamental for reading the empirical literatures with respect to Macroeconomics and Finance. Besides, the knowledge of time series analysis is also beneficial for understanding the modern panel data models. Students who plan to work in the financial industry or pursue advanced empirical studies should take this course.

Course Context or Rationalization:

The knowledge of time series analysis is the building blocks for all empirical studies involving the time dimension. Therefore, this course is highly related to the following courses: (i) Monetary Economics and Policy Analysis, (ii) International Trade and Investment, (iii) International Finance, (iv) Empirical Finance, and (v) Money and Banking.

Delivery Methods:

The course will follow the traditional lecturing form. Students are required to take their own class notes. Since the course is mathematical oriented, writing down the derivations of each equation in class will help student better understand the materials.

Assessment:

Problem set: 40%
Term Project: 60%

Prerequisite:

Mathematical Methods, Statistical Methods, and Econometrics (or Data Analysis)

Textbook(s)

Required books:

There is no required textbook for this course.

Reference books:

R. C Hill, W. E. Griffiths, and G. C. Lim, *Principles of Econometrics*, 4th Edition, 2012. (ISBN: 978-0-470-87372-4)

Walter Enders, *Applied Econometric Times Series*, 3rd Edition, Wiley, 2009. (ISBN-10: 0470505397; ISBN-13: 978-0470505397)

James D. Hamilton, *Time Series Analysis*, Princeton University Press, 1994. (ISBN-10: 0691042896; ISBN-13: 978-0691042893)

Ruey S. Tasy, *Analysis of Financial Time Series*, 3rd Edition, John Wiley & Sons, Inc., 2010. (ISBN 978-0-47041435-4)

	<p>Kennedy, <i>A Guide to Econometrics</i>, 6th Edition, Wiley-Blackwell, 2008. (ISBN-13: 978-1405182577)</p> <p>Fumio Hayashi, <i>Econometrics</i>, Princeton University Press, 2000. (ISBN-10: 0691010188; ISBN-13: 978-0691010182)</p> <p>Chris Brooks, <i>Introductory Econometrics for Finance</i>, 3rd Edition, Cambridge University Press, 2014. (ISBN-10: 1107661455; ISBN-13: 978-1107661455)</p>
Class Outline	<ol style="list-style-type: none"> 1. Properties of Time Series Data 2. The Lag Operator 3. Weak Stationarity 4. Deterministic Trends and Ways of Removing Them 5. Autoregressive Models: Introduction 6. Autoregressive Models: Estimation and Model Selection Criteria 7. Moving Average Models 8. Mixed Autoregressive Moving Average (ARMA) Models 9. Impulse Response Functions 10. Nonstationary Time Series 11. Problems of Nonstationarity 12. Stochastic Trends and Unit Root Tests 13. Power of Unit Root Tests 14. Hodrick-Prescott Decomposition 15. Vector Autoregressive Model: Introduction 16. Reduced-form VAR Models and the Granger Causality Test 17. Structural VAR Models 18. Cointegration 19. The Vector Error Correction Model 20. Cointegration Tests
Others (if any)	