

Southampton EC6003, Quantitative Economics

Lecturer: John Bluedorn

Semester 2 from 9 Mar. 2009 to 7 May 2008

Mondays, 11:00-13:00, in 58/2097 (Murray Building, Room 2097)
and

Thursdays, 15:00-17:00, in 34/5001 (Education Building, Room 5001)

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in 58/3111 (Murray Building)

for Semester 2, Academic Year 2008-2009

I. Course Objectives The primary purpose of this course is to develop your ability to conduct, interpret and evaluate empirical work in economics. The course focuses on the role of statistical methods for investigating and evaluating hypotheses concerning economic ideas. In the second half, we will focus upon issues related to time series and panel data analysis using linear models, with a mixture of theory and practice.¹ However, the general emphasis of the course is how to use the econometric tools in practice and what threats to inference they can and cannot address. The theoretical underpinnings of the econometric methods will not be explored in their full technical detail (e.g., we will not delve into the frequency domain and spectral analysis in any depth).

Although the methods that we study are of general applicability, many of the examples and exercises will draw upon research questions and data from empirical macroeconomics. There will be 2 assessed problem sets. They will involve a mixture of questions and statistical analysis using Stata.² As part of the course, we will also discuss some of the practical issues that confront empirical researchers (e.g., messy and/or missing data) and consider strategies for dealing with them.

II. Assessment Your final course mark will be determined by: (a) final examination with a weight of 75% (equal weights to material from the first and second halves) and (b) the two problem sets with a total weight of 12.5% from the second half (6.25% each). Please consult with Dr. Calvo-Pardo for the exact breakdown of the problem set assessment for the first half.

I anticipate that the problem sets will be due on the Monday of semester 2, week 8 (just after Easter vacation) and the Monday of semester 2, week 10 (our last week). They will be posted on Blackboard in advance (I will email you). Details on their submission are forthcoming.

¹There is a large literature devoted to non-linear econometric models (e.g., structural breaks, Markov-switching regressions, threshold regressions, bilinear processes, etc.). Although interesting and important, we will not have time to cover these areas.

²Although we will use Stata (it is the statistical analysis package with which I am most familiar), there is an excellent open source option known as R which may be useful. It is free to install (all major OX supported) and use from <http://cran.r-project.org>.

III. Notes on the Readings For the readings, there is no single text which suffices. However, there are a variety of general resources on time series and panel analysis which I have found useful, including:

- [Hamilton \[1994\]](#) – the canonical reference on time series analysis
- [Lütkepohl and Krätzig \[2004\]](#) – an edited volume of papers on time series methods for practitioners
- [Wooldridge \[2002\]](#) – an excellent advanced introductory text to econometrics which includes chapters devoted to classical panel data analysis

For those readings which are articles or working papers, I will post the PDF version on the Blackboard website. There are two types of readings listed: primary readings which are recommended; and secondary readings which are either optional or represent useful references on the topic.

A useful resource for users of Stata is the Stata Journal, which explains new commands and gives hints on more efficient data analysis practices within Stata. PDF versions of the articles in recent issues (past two years) can be accessed within the campus domain (viz., locally or via VPN) at:

<http://www.soton.ac.uk/library/soton/stata/>

The full archive of the Stata Journal is at:

<http://www.stata-journal.com/archives.html>

Only the articles from 2005 are free in PDF form at this website. The hard copy version of the Stata Journal is available in the library.

The (very) rough schedule and associated readings for the course are given below. If there are any major revisions, I will email you.

Schedule of Topics and Readings

I. Week 6, Lec. 1

(a) Causation and Identification

- i. Secondary readings are [Angrist et al. \[1996\]](#) (a good introduction to the potential outcomes framework for thinking about causation and identification); [Rubin \[2005\]](#) (a historical survey of the potential outcomes framework written by a pioneer in its use); chap. 18 [Wooldridge \[2002\]](#) (a thorough introduction to estimating average treatment effects using the potential outcomes framework).

(b) Important Concepts and Tools in Time Series Analysis – ergodicity, stationarity, lag operators and difference equations, representation theorems.

- i. Primary reading is chap. 1-3 [Hamilton \[1994\]](#).
- ii. Secondary readings are chap. 1-2 [Lütkepohl and Krätzig \[2004\]](#); chap. 3.3 [Cochrane \[2005\]](#); chap. 9-11 [Sargent \[1987\]](#) (an excellent resource for information on lag operators and difference equations).

II. Week 6, Lec. 2

(a) Univariate ARMA Models (stationary single equation models)

- i. Primary readings are chap. 3 [Hamilton \[1994\]](#); chap. 2-3.3 [Cochrane \[2005\]](#); [Baum \[2005\]](#).
- ii. Secondary reading is [Romer and Romer \[2004\]](#) (an application of single equation modeling combined with an interesting identification approach which looks at the effect of monetary policy upon output and inflation).

(b) Data Filters

- i. Primary reading is [Cogley \[2008\]](#) (a clear and concise discussion of filters and their problems).

III. Week 7, Lec. 1

(a) Vector Autoregressions (VARs) introduction – identification via contemporaneous restrictions, impulse responses, forecast error variance decompositions, diagnostics.

- i. Primary readings are chap. 10-11 [Hamilton \[1994\]](#); [Stock and Watson \[2001\]](#) (a gentle introduction written for the Journal of Economic Perspectives).
- ii. Secondary reading is [Sims \[1980\]](#) (a classic article which heralded the widespread use of VARs in much empirical work in macroeconomics).

IV. Week 7, Lec. 2

(a) Nonstationarity and Cointegration Concerns

- i. Primary reading is chaps. 17-19 [Hamilton \[1994\]](#).
 - ii. Secondary readings are chaps. 10-11 [Cochrane \[2005\]](#); [Pesaran et al. \[2001\]](#).
- (b) Identification and Invertibility
- i. Secondary readings are [Hansen and Sargent \[1991\]](#) (an article that highlights the link between identification and invertibility of the MA representation); [Kasa \[2003\]](#) (an article that notes that the invertibility problem likely applies to a host of present-value tests, focusing upon the particular case of the intertemporal approach to the current account).
- (c) VAR Impulse Responses and Alternatives
- i. Primary reading is [Jorda \[2005\]](#) (an important article noting the sensitivity of the VAR to comparatively small misspecification; he advocates the use of local projection methods to derive impulse responses).

V. Week 8, Lec. 1

- (a) Identification Strategies in VARs: Beyond Contemporaneous Restrictions
- i. Long-run restrictions
 - A. Primary reading is [Fry and Pagan \[2005\]](#).
 - B. Secondary readings are [Blanchard and Quah \[1989\]](#) (a classic article which uses long-run restrictions to identify aggregate demand and supply shocks, and then considers their effects upon economic performance); [Faust and Leeper \[1997\]](#) (an important critique of long-run restrictions).
 - ii. Sign restrictions
 - A. Primary reading is [Fry and Pagan \[2007\]](#).
 - B. Secondary reading is [Uhlig \[2005\]](#) (an application which uses sign restrictions to estimate the effect of monetary policy upon economic performance).
 - iii. Second moment restrictions (identification through heteroskedasticity)
 - A. Primary reading is [Rigobon \[2003\]](#).
 - B. Secondary reading is [Rothenberg and Ruud \[1990\]](#) (the prior contribution on this topic).

VI. Week 8, Lec. 2

- (a) VARs and monetary policy evaluation – linkages and alternatives
- i. Primary reading is [Blanchard \[2008\]](#) (an explanation of the general convergence of the profession upon the New Keynesian 3 equation model as a natural benchmark, despite shortcomings). Revisit [Jorda \[2005\]](#).

- ii. Secondary readings are [Clarida et al. \[1999\]](#) (the canonical reference for a survey of New Keynesian models); [Woodford \[2003\]](#) (the definitive source for Wicksellian, New Keynesian models of monetary policy). For a recent consideration of how DSGE (dynamic stochastic general equilibrium) models and Bayesian methods meet in a VAR framework, see [Fernández-Villaverde \[2009\]](#).

VII. Week 9, Lec. 1,2

(a) Classic Static Panel Models - Fixed and Random Effects

- i. Primary reading is chaps. 10-11 [Wooldridge \[2002\]](#).
- ii. Secondary readings are [Rose \[2000\]](#) (an interesting application of panel data analysis which considers the effect of currency union membership on trade); [Fraïn \[2006\]](#) (a good introduction to static panel model estimation in Stata).

VIII. Week 10, Lec. 1,2

(a) Dynamic Panel Models - Difference and System GMM

- i. Primary reading is [Roodman \[2007\]](#) (an excellent article describing the econometrics of difference and system GMM and how to use the author's package in Stata to estimate such models).
- ii. Secondary readings are [Arellano and Bond \[1991\]](#) (the original difference GMM reference for dynamic panel models); [Blundell and Bond \[1998\]](#) (the original system GMM reference for dynamic panel models); [Bruno \[2005\]](#) (an alternative for small N, large T dynamic panel models with explanation of the author's Stata package to estimate such models); [Levine et al. \[2000\]](#) (a paper using dynamic panel GMM methods to investigate the relationship between growth and financial development); [Baum et al. \[2007\]](#) (an article describing how the authors' Stata package estimates via instrumental variables, in part using GMM methods).

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