ECON 224A

TIME SERIES ECONOMETRICS

Spring 2010

Professor: Fabio Milani, **fmilani@uci.edu**
Office Hours: SSPA 3145, Mon 10.30-12.00 PM

Time and Location: Th 5.00 PM - 7.40 PM, SSPA 3132
Course Webpage: **http://www.socsci.uci.edu/~fmilani/TS2010.html**

Grading:

Assignments	**15%**
Referee Report on VAR paper	**10%**
In-Class Presentations	**15%**
Final Exam **or Time Series Paper**	**60%**

There will be about 2-3 assignments in the quarter. You can work in groups, but each member has to turn in the homework individually. You can choose to take a final written exam at the end of the course or, instead, to work on a time series paper, which should be submitted by the end of the quarter. The exam and the paper will be the main determinants of your grade. The paper can be on a topic of your choice, but it needs to be done using some of the techniques learned in class. It's better if you start thinking about the paper immediately.
In addition, you will have to prepare a referee report chosen from the list of papers on VARs (more later in the course). During almost all lectures, there will be some in-class presentations in which you will be in turn responsible of presenting one of the topics or one paper in the syllabus.

Course description:

The course is an introduction to time series econometrics, with special emphasis on Bayesian methods. The topics we'll study include AR, MA, ARMA models, Stationarity, Deterministic and Stochastic Trends, Structural Breaks, VAR, Structural VAR, Bayesian VAR models, and Dynamic Factor models. We will see how to estimate state-space models, which are useful to estimate general equilibrium macroeconomic models, but can be employed in other fields as well. We will focus on linear rational expectations model with normal shocks, but we'll also discuss the estimation issues that arise for nonlinear/non-normal models and for models with near-rational expectations.

The most comprehensive book if you are interested in learning time series is Hamilton (1994), although it focuses mostly on the classical, rather than Bayesian approach. A less technical book is Enders, which can be useful if you are interested in learning the techniques, but do not want to go into the details of the theory. The book by Lutkepohl and Kratzig is another good choice on applied time series, and Lutkepohl is another choice for a theory book. A Bayesian-oriented time series book is Bauwens, Lubrano, and Richard (1999). A Bayesian book, not really focused on time series, but useful is Koop (2004).

For the last part of the course (estimation of state-space, macro models), there are now a number of useful references, some of those available for free online or in newly published books (Schorfheide lecture notes, and books by Canova, and by DeJong and Dave).

Books:

Time Series Analysis, **Hamilton**

Time Series for Macroeconomics and Finance, **Cochrane**
Applied Time Series Econometrics, **Enders**
Applied Time Series Econometrics, **Lutkepohl and Kratzig**
New Introduction to Multiple Time Series Analysis, **Lutkepohl**
Bayesian Econometrics, **Koop**
Bayesian Inference in Dynamic Econometric Models, **Bauwens, Lubrano, and Richard**
State-Space Models with Regime Switches, **Kim and Nelson**
Methods for Applied Macroeconomic Research, **Canova**
Estimation and Evaluation of DSGE Models, Lecture Notes, **Schorfheide**
An Introduction to Modern Bayesian Econometrics, **Lancaster**

Reading List - PRELIMINARY

(Highly recommended readings are indicated by a ' * ')

1. **Time Series Models: AR, MA, ARMA. Stationarity, Estimation.**
   *Hamilton
   Enders
   *Cochrane

2. **Nonstationarities. Deterministic and Stochastic Trends, Unit Root Tests (Classical vs. Bayesian View)**
   *Hamilton
   Enders
   *Sims and Uhlig (1991)
   *Bauwens, Lubrano, and Richard (1999)
   *Beveridge & Nelson (1982)

3. **Structural Breaks. Tests**
   *Hamilton
   Enders

4. **Forecasting.**
   Diebold, (2006) Elements of Forecasting.
   *Hamilton

5. **VAR, Impulse Responses, SVAR**
   *Sims (1980), "Macroeconomics and Reality," *Econometrica*
   *Hamilton (1994)
   Enders
   Leeper, and Zha (2003), "Modest policy interventions," *Journal of Monetary Economics*
   *Stock and Watson (2001), "Vector Autoregressions," *Journal of Economic Perspectives*
   *Blanchard, O. and Quah, D. (1989), "The Dynamic Effect of Aggregate Demand and Supply Disturbances", American Economic Review, 79, 655-673.
   Sims and Zha (1998), "Bayesian Methods for Dynamic Multivariate Models," *International Economic Review*
   Canova, F. (2007) Methods for Applied Macroeconomic Research, Chapter 4.
   Canova, F., (1995), "The Economics of VAR Models", in K. Hoover, ed., Macroeconometrics: Tensions and Prospects, Kluwer Press.
   Canova, F., (1995), "VAR Models: Specification, Estimation, Inference and Forecasting", Handbook of Applied Econometrics, Ch.2 , Blackwell
   Cooley, T. and LeRoy, S. (1985), "Atheoretical macroeconomics: A critique, Journal of Monetary Economics, 16, 283-308.
   *Chari, V., Kehoe, P. and McGrattan, E. (2004) A critique of Structural VARs using Business cycle theory, Fed of Minneapolis, working paper 631.
   *Christiano, L., Eichenbaum, M and Vigfusson, R. (2005) Assessing Structural VARs, Northwestern University, NBER Macroeconomic Annual.
   Fernandez Villaverde, J., Rubio Ramirez, J. and Sargent, T. (2005) The ABC and (D's) to understand VARs, forthcoming AER.
   Uhlig, H. (2005) What are the Effects of Monetary Policy? Results from an agnostic Identification procedure, Journal of Monetary Economics.
   *Canova, F. and De Nicolo, G (2002), Money Matters for Business Cycle Fluctuations in the G7, Journal of Monetary Economics 49, 1131-1159.
   Erceg, C, Guerrieri, L. and Gust, C. (2005) Can long run restrictions identify technology shocks?, Journal of the European Economic Association.
   Faust, J. and Leeper, E. (1997) Do Long Run Restrictions Really Identify Anything?, Journal of Business and Economic Statistics, 15, 345-353.
   Sims, C. and Zha, T. (1999) Error Bands for Impulse Responses", *Econometrica*, 67, 1113-1155.
   Giordani, P. (2004) "An Alternative Explanation of the Price Puzzle", *Journal of Monetary Economics*, 51, 1271-1296.

Dedola, L. and Neri, S. (2004), "What does a technology shock do? A VAR analysis with model-based sign restrictions", Journal of Monetary Economics.
Christiano, L., Eichenbaum, M and Vigfusson, R. (2006), VARs as a Guide to Estimating Dynamic General Equilibrium Models
*Christiano, Eichenbaum, and Evans, Monetary Policy Shocks: What Have We Learned and to What End?.
Christiano, L., Eichenbaum, M and Vigfusson, R., What Happens After a Technology Shock?
Gali Jordi, 1992. "How Well Does the IS-LM Model Fit Postwar U.S. Data," *Quarterly Journal of Economics*
Francis, Neville & Ramey, Valerie A., 2005. "Is the technology-driven real business cycle hypothesis dead? Shocks and aggregate fluctuations revisited," *Journal of Monetary Economics*

6. **Bayesian VARs**
*Bauwens, Lubrano, and Richard (1999)
Canova, Methods for Applied Macroeconomic Research
Doan, Litterman, and Sims (1984). "Forecasting and conditional projection using realistic prior distributions", *Econometric Review*
Litterman (1986), "Forecasting with Bayesian Vector Autoregressions - five years of experience", *JBES*

TV Coefficients/TV Volatilities:
Hamilton (1994)
Kim and Nelson (1999)
Carter and Kohn (1994), On Gibbs sampling for state space models, *Biometrika*
*Kim, Shephard, and Chib (1998), "Stochastic Volatility: Likelihood Inference and Comparison with ARCH Models", *RES*
*Primiceri (2005), "Time Varying Structural Vector Autoregressions and Monetary Policy", *RES*

7. **State-Space Models, Kalman Filter**
*Hamilton (1994)
Hamilton, "State-Space Models" *Handbook of Econometrics*, Volume 4
*Kim and Nelson
Canova
Schorfheide, *Estimation and Evaluation of DSGE Models*, Lecture Notes

8. **Dynamic Factor Models, Factor-Augmented VARs**

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9. **Bayesian Estimation of DSGE Models**
*Schorfheide, *Estimation and Evaluation of DSGE Models*, Lecture Notes
*An and Schorfheide (2007), Bayesian Analysis of DSGE Models, *Econometric Reviews*, forthcoming.
Schorfheide (2000)

*Sims, (2000). “Solving Linear Rational Expectations Models”, *Computational Economics.*

10. **Models with Time-Varying Volatility, GARCH, Stochastic Volatility**
    Fernandez-Villaverde and Rubio-Ramirez (2006)
    Pitt and Shephard (1999)
    Particle Filter notes
    Justiniano and Primiceri (2005)
    Amisano and Tristani (2006)

11. **Regime-Switching Models**
    Kim and Nelson
    Hamilton (1994)
    Sims and Zha (2006)

12. **Nonlinear Models**

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13. **Bayesian Model Comparison, Bayesian Model Averaging**
    Koop
    Madigan, Raftery