Marc Nerlove
09/19/07

AREC699, Fall 2007: Special Topics in Econometrics, Study Group

Bayesian Statistics and Econometrics

Dates, Times, Topics and Readings

Rules of the game:

At least six students must register for one or two credits by August 15, 2007. Otherwise, this course is cancelled. No audits are permitted.

All students who have taken the departmental qualifying examination at the Ph. D. level are eligible for this Seminar/Study Group. Those who are required to take Professor Just's AREC869J may register for his course but attend the Seminar/Study Group to receive credit.

Three credits AREC 699 will count as one three-credit field course in applied econometrics if all three units are taken for a letter grade (not S/U or P/F). This credit will not count toward fulfilling the requirement of one two-course field of the three offered in the department as described at

http://www.arec.umd.edu/Academic/Gradprog/PhD_Program_Course_Requirements.htm
.
No other AREC 699 credit may be used to fulfill the requirement of 6 second-year field courses in the PhD program.

You can take Special Topics in Econometrics more than once for one or two credits in order to fulfill the requirement of three credits for a field course in applied econometrics.

You should also be aware that while students can take AREC 869J and attend AREC 699 course meetings in lieu of most other attendance requirements, credit for AREC 869J with that approach cannot be combined with two other credits of AREC 699 to constitute the equivalent of a field-level course.

Each student, who wishes to attend our study group, whether registered for independent study with me or AREC669J with Professor Just, **must attend the organizational session on Monday, September 17, 3:30-5:30, Room 2200B**, to assume responsibility for presenting all or part of one of the following topics. Thereafter, each must attend every one of the seven 2-hour sessions on each of the topics, do the suggested reading, and participate. If there is not a quorum of at least 6 students, the session will be cancelled. Failure to attend the organizational session will mean the student will not be allowed to attend further sessions. If you fail to attend other sessions during the semester,

I may throw you out. **Come to our organizational meeting prepared to choose your topic. Before our organizational meeting read (Sims lecture should help you choose):**

Christopher A. Sims, "Bayesian Methods in Applied Econometrics, or, Why Econometrics Should Always and Everywhere Be Bayesian," August 6, 2007. Available at http://sims.princeton.edu/yftp/EmetSoc607/AppliedBayes.pdf

Apart from the organizational meeting, **we will meet on Mondays from 3:30 – 5:30 when there is no faculty meeting. Faculty meetings are scheduled on October 8, November 12, and December 10.** The following 8 Mondays are available: Oct. 1, Oct. 15, Oct. 22, Oct. 29, Nov. 5, Nov. 19, Nov. 26, and Dec. 3. Dec, 17. is the Monday before finals start in your other classes, so I've omitted that. We may not be able to meet on days when I have to schedule an unforeseen medical appointment. Hoping for the best, however, I've set up 8 topics.

Each presenter should prepare a PowerPoint presentation and distribute it to the rest of us after any necessary corrections or modifications.

I have asked Katherine to purchase the following books for the AREC Library:

Bayesian Econometric Methods
by Gary Koop, Dale L. Poirier, Justin L. Tobias, ISBN: 0521671736

Bayesian Econometrics
by Gary Koop ISBN: 0470845678

Bayesian Theory
by Jose M. Bernardo, Smith Adrian F. M. ISBN: 047149464X

Bayesian Choice: From Decision-Theoretic Motivations to Computational Implementation
by Christian P. Robert ISBN: 0387952314

Subjective and Objective Bayesian Statistics: Principles, Models, and Applications
by S. James Press ISBN: 0471348430

Contemporary Bayesian Econometrics and Statistics
by John F. Geweke ISBN: 0471679321

Bayesian Core: A Practical Approach to Computational Bayesian Statistics
by Jean-Michel Marin, Christian P. Robert ISBN: 0387389792

Introduction to Modern Bayesian Econometrics
by Tony Lancaster ISBN: 1405117206

I have added a list of ***Supplementary Readings*** to my suggestions for each topic. To some extent this division is arbitrary. Those students responsible for a particular topic should send us all an e-mail at least a week before the session scheduled for that topic telling us which readings are especially recommended or on which we should focus. Many of the supplementary readings are selected from articles in *Statistical Sciences* and *The American Statistician*, the expository and didactic journals of, respectively, the Royal Statistical Society and the American Statistical Association. You may find these articles particularly helpful in understanding particular topics and methods, but, in and of themselves, they cannot serve as a unified exposition of each topic. At the end of the syllabus I've added a list of additional topics and readings. Taken together these readings should serve as a reasonably complete bibliography for Bayesian inference as it applies to problems in econometric inference.

You should be familiar with Matlab ver. R2007a and the latest version (6.0) of the Statistics Toolbox. The following third-party toolboxes are available on the web and loaded on our Matlab path at the University:

Jim LeSage's Econometrics Toolbox at http://www.spatial-econometrics.com/.

Computational Statistics Handbook with MATLAB, by Wendy L. Martinez and Angel R. Martinez, Chapman & Hall/CRC, 2002, ISBN 1-58488-229-8. A library of Matlab M-files, Computational Statistics Toolbox, to supplement Mathwork's own Statistics Toolbox, accompanies this book and is available for free download. http://www.crcpress.com/e_products/downloads/download.asp?cat_no=C2298 . You can access it from all the AREC computers which run Matlab. It is called CompStats We used this book as our main text Fall, 2006, in Special Topics in Econometrics: Computational Statistics: Monte Carlo, Bootstrapping and Simulation. It has excellent exercises. This book is available in the AREC Library.

Gary Koop has a set of Matlab m-files and data files to accompany his book, *Bayesian Econometrics*, available at: http://www.wiley.com//legacy/wileychi/koopbayesian/

Justin Tobias has a set of m-files associated with Koop, Poirer and Tobias at http://www.econ.iastate.edu/faculty/tobias/Bayesian_exercises.html

There are two important packages for doing Bayesian statistics and econometrics available for free down load: Here they are with some tutorials for their use. I have asked Jeff to put the two Matlab versions on the Matlab search path on our network system.

winBugs at http://www.mrc-bsu.cam.ac.uk/bugs/welcome.shtml . Kevin Murphy (not the economist) has a Matlab interface to winBugs at http://www.cs.ubc.ca/~murphyk/Software/MATBUGS/matbugs.html .

Petra Kuhnert, An Introduction to WinBUGS 1.4, http://www.math.unm.edu/~bedrick/PIBBS/Winbugstutorial0.doc

Helsinki Tutorial, http://mathstat.helsinki.fi/openbugs/data/Docu/Tutorial.html

Mary Kathryn Cowles, "Review of WinBUGS 1.4,"*The American Statistician*; Nov 2004; 58, 4, pp. 330-336.

BACC software developed in connection with the project Bayesian Communication in the Social Sciences, Siddhartha Chib and John Geweke principal investigators. Used in Geweke's book, *Contemporary Bayesian Econometrics and Statistics*. Software and documentation available at http://www2.cirano.qc.ca/~bacc/bacc2003/index.html .

User Manual for the Windows Matlab Version of BACC at:
http://www2.cirano.qc.ca/~bacc/bacc2003/index.html

Geweke, J. (1999) "Using Simulation Methods for Bayesian Econometric Models: Inference, Development, and Communication" (with discussion and rejoinder), *Econometric Reviews* 18: 1-126. Condensed version at:
http://www2.cirano.qc.ca/~bacc/bacc2003/index.html

Topic 1 (October 1): Foundations: Bayes's Theorem and Subjective Probability

Presenters: Qing and Kohei

S. James Press: *Subjective and Objective Bayesian Statistics: Principles, Models, and Applications*, 2nd ed. (2003). Chap. 1, "Background," pp.3-17; Chap. 2,"A Bayesian Perspective on Probability," pp.17-33.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods*, Chap. 1, "The Subjective Interpretation of Probability," pp. 1-9; Chap. 2, "Bayesian Inference," pp. 11-28.

Joyce, James "Bayes' Theorem", *The Stanford Encyclopedia of Philosophy* (Summer 2007 Edition), Edward N. Zalta (ed.), forthcoming URL = http://plato.stanford.edu/archives/sum2007/entries/bayes-theorem/

Hájek, Alan, "Interpretations of Probability", *The Stanford Encyclopedia of Philosophy (Summer 2003 Edition)*, Edward N. Zalta (ed.), URL = http://plato.stanford.edu/archives/sum2007/entries/probability-interpret/

Supplementary:

Hotelling, H., "The Statistical Method and the Philosophy of Science," *The American Statistician*, Vol. 12, No. 5. (Dec., 1958), pp. 9-14.

Edward E. Leamer, "Let's Take the Con Out of Econometrics ," *The American Economic Review*, Vol. 73, No. 1. (Mar., 1983), pp. 31-43.

Hartley, H. O. "In Dr. Bayes' Consulting Room," *The American Statistician*, Vol. 17, No. 1. (Feb., 1963), pp. 22-24.

Lindley, D. V., "The Analysis of Experimental Data: The Appreciation of Tea and Wine," http://www2.isye.gatech.edu/~brani/isyebayes/bank/lindleybayeslady.pdf

F. J. Anscombe, "Bayesian Statistics," *The American Statistician*, Vol. 15, No. 1. (Feb., 1961), pp. 21-24.

Lindley, D. V., " The Future of Statistics: A Bayesian 21st Century," *Advances in Applied Probability*, Vol. 7, Supplement: Proceedings of the Conference on Directions for Mathematical Statistics. (Sep., 1975), pp. 106-115.

B. Efron, "Why Isn't Everyone a Bayesian?" *The American Statistician*, Vol. 40, No. 1. (Feb., 1986), pp. 1-5. Comments and reply, pp. 5-11.

S. M. Stigler, "Who Discovered Bayes' Theorem?," *The American Statistician*, Vol. 37, No. 4, Part 1. (Nov., 1983), pp. 290-296.

Fishburn, Peter C. "The Axioms of Subjective Probability," *Statistical Science*, Vol. 1, No. 3. (Aug., 1986), pp. 335-345.

Topic 2 (October 15): Bayesian Inference; Choice of Prior

Presenters: Elizabeth and Nitish

S. James Press: *Subjective and Objective Bayesian Statistics: Principles, Models, and Applications*, 2nd ed. (2003). Chap. 3,"The Likelihood Function," pp.34-40; Chap. 4, "Bayes' Theorem," pp. 41-69; Chap. 5, "Prior Distributions," pp. 73-116.

Gary Koop, *Bayesian Econometrics* (2003), Chap. 1, "Overview of Bayesian Econometrics," pp. 1-13.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 2, "Bayesian Inference," pp. 11-28; Chap. 3, "Point Estimation," pp.29-36; Chap. 4, "Frequentist Properties of Bayesian Estimators," pp. 37-49;Chap. 5, "Interval Estimation," pp.51-58; Chap. 6 "Hypothesis Testing," pp. 59-70; Chap. 7, "Prediction," pp. 71-78; Chap. 8, "Choice of Prior," pp. 79-89.

Clifford Hildreth, "Bayesian Statisticians and Remote Clients," *Econometrica*, Vol. 31, No. 3. (Jul., 1963), pp. 422-438.

Supplementary

Tony Lancaster, *Introduction to Modern Bayesian Econometrics* (2004), Chap. 1, "The Bayesian Algorithm," pp. 1-69; Chap. 2, "Prediction and Model Criticism," pp. 70-111..

Jose M. Bernardo, Smith Adrian F. M , *Bayesian Theory:* Section 5.1, "The Bayesian Paradigm," pp.241-265; Section 5.2 "Conjugate Families," pp.265-284.

Andrew B. Gelman, John S. Carlin, Hal S. Stern, and Donald Rubin, *Bayesian Data Analysis* (1995), Part 1: "Fundamentals of Bayesian Inference," pp 1-115.

Wikipedia, Conjugate Prior, http://en.wikipedia.org/wiki/Conjugate_prior .

Daniel Fink, "A Compendium of Conjugate Priors," http://www.people.cornell.edu/pages/df36/CONJINTRnew%20TEX.pdf .

Danial Fink and Daniel Goodman, "Using Conjugate Composition Priors to Compute Posterior Distributions," http://www.people.cornell.edu/pages/df36/CONJCOMPnew.pdf

S. R. Dalal and W. J. Hall, "Approximating Priors by Mixtures of Natural Conjugate Priors," *J. R .Statist. Soc. B* (1983),45, No. 2,pp. 278-286

Stephen M. Stigler, "The 1988 Neyman Memorial Lecture: A Galtonian Perspective on Shrinkage Estimators," *Statistical Science,* Vol. 5, No. 1. (Feb., 1990), pp. 147-155.

A. M. Skene, J. E. H. Shaw and T. D. Lee, " Bayesian modelling and sensitivity analysis," *The Statistician* (1986) 35, pp. 281-288

Topic 3 (October 22): The Normal Linear Regression Model

Presenters: Katie and Nitin

Gary Koop, *Bayesian Econometrics* (2003), Chap. 2, "The Normal Linear Regression Model with Natural Conjugate Prior and a Single Explanatory Variable," pp.15-32; Chap. 3, " The Normal Linear Regression Model with Natural Conjugate Prior and Many Explanatory Variables," Chap. 4, pp.33-57; The Normal Linear Regression Model with Other Priors," pp. 59-87.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 10, "The Linear Regression Model," pp. 107- 115.

Supplementary

Tony Lancaster, *Introduction to Modern Bayesian Econometrics* (2004), Chap. 1, "Linear Regression Models," pp. 112-182.

S. James Press: *Subjective and Objective Bayesian Statistics: Principles, Models, and Applications*, 2nd ed. (2003). Chap.12, "Bayesian Inference in the General Linear Model," pp. 283-319.

Andrew B. Gelman, John S. Carlin, Hal S. Stern, and Donald Rubin, *Bayesian Data Analysis* (1995), Chap. 8, "Introduction to Regression Models," pp. 233-265

Peter Congdon, *Bayesian Statistical Modelling, 2nd ed.* (2007), Chap. 4, "Normal Linear Regression, General Linear Models, and Log-Linear Models," pp.109-150.

Jean-Michel Marin and Christian P. Robert, *Bayesian Core: A Practical Approach to Bayesian Statistics* (2007), Chap. 2, "Normal Models," pp. 15-46; Chap. 3, Regression and Variable Selection," pp. 47-84.

Arnold Zellner, *An Introduction to Bayesian Inference in Economics* (1971), Chap.3, "The Univariate Normal Regression Model," pp. 58-85; Chap.4, 'Special Problems in Regression Analysis," pp.86-113; Chap. 5, "On Errors in the Variables," pp. 114-161.

D. V. Lindley and A. F. M. Smith, "Bayes Estimates for the Linear Model," *Journal of the Royal Statistical Society. Series B (Methodological)*, Vol. 34, No. 1. (1972), pp. 1-41.

Wolfgang Polasek and Andreas Krause, "Bayesian Regression Model with Simple Errors in Variables Structure, *The Statistician*, Vol. 42, No. 5, Special Issue: Conference on Practical Bayesian Statistics, 1992 (2). (1993), pp. 571-580.

Topic 4 (October 29): The Nonlinear Regression Model; the Linear Regression Model with Nonspherical Errors; Bayesian Computational Problems and Methods

Presenters: Will and Andy

Gary Koop, *Bayesian Econometrics* (2003), Chap. 5, "The Nonlinear Regression Model," pp. 89-115; Chap. 6, "The Linear Regression Model with General Covariance Matrix," pp. 117-146.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 11: "Basics of Bayesian Computation," pp. 117-168; Chap. 13, "The Linear Regression Model with General Covariance Matrix," pp. 191-202.

George Casella; Edward I. George, "Explaining the Gibbs Sampler,"*The American Statistician*, Vol. 46, No. 3. (Aug., 1992), pp. 167-174.

Siddhartha Chib; Edward Greenberg, "Understanding the Metropolis-Hastings Algorithm," *The American Statistician*, Vol. 49, No. 4. (Nov., 1995), pp. 327-335.

Stephen P. Brooks, "Markov Chain Monte Carlo Method and Its Application, "*The Statistician*, Vol. 47, No. 1. (1998), pp. 69-100.

Supplementary

David B Hitchcock, "A History of the Metropolis-Hastings Algorithm," *The American Statistician;* Nov 2003; 57, 4; pp. 254-257.

Tony Lancaster, *Introduction to Modern Bayesian Econometrics* (2004), Chap. 4, "Bayesian Calculations," pp. 183-226; Chap. 5, "Nonlinear Regression Models," Sec. 5.1, "Estimation of Production Functions," pp.227-229.

S. James Press: *Subjective and Objective Bayesian Statistics: Principles, Models, and Applications*, 2nd ed. (2003). Part II Numerical Implementation of the Bayesian Paradigm: Chap.6 (by Siddhartha Chib), Markov Chain Monte Carlo Methods," pp. 119-153; Chap. 7, "Large Sample Posterior distributions and Approximations," pp. 170.

Andrew B. Gelman, John S. Carlin, Hal S. Stern, and Donald Rubin, *Bayesian Data Analysis* (1995), Part III, "Advanced Data Analysis": Chap. 9, "Approximation Based on Posterior Modes," pp. 269-299; Chap. 10, "Posterior Simulation and Integration," pp.300-319; Chap. 11, "Markov Chain Simulation," pp.320-344.

Martin A. Tanner, *Tools for Statistical Inference: Methods for the Exploration of Posterior Distributions and Likelihood Functions 3rd ed.*, Chapter 6, "Markov Chain Monte Carlo: The Gibbs Sampler and the Metropolis Algorithm," pp.137-192.

John Geweke, "Posterior Simulators in Econometrics, Working Paper 555, September, 1995, Federal Reserve Bank of Minneapolis, Research Department.

John F. Geweke, *Contemporary Bayesian Econometrics and Statistics*, Wiley, 2005, Chap. 4, "Posterior Simulation," pp. 105-152; Chap. 5, "Linear Models," pp 153-193.

Robert E. Kass; Bradley P. Carlin; Andrew Gelman; Radford M. Neal, "Markov Chain Monte Carlo in Practice: A Roundtable Discussion" *The American Statistician*, Vol. 52, No. 2. (May, 1998), pp. 93-100.

Christian P. Robert and George Casella, *Monte Carlo Statistical Methods, 2nd Ed.*, Springer (2004). UMCP EPSL Stacks | QA276 .R575 2004.

Charles J. Geyer,” Practical Markov Chain Monte Carlo," *Statistical Science*, Vol. 7, No. 4. (Nov., 1992), pp. 473-483.

Topic 5 (November 5): Hierarchical Models; Panel Data Econometrics

Presenters: Jia and Michelle

Tony Lancaster, *Introduction to Modern Bayesian Econometrics* (2004), Chap. 6, "Randomized, Controlled, and Observational Data," pp.265-276; Chap. 7, "Models for Panel Data," pp. 277-310.

M. Nerlove, "Comments on: Panel data analysis—advantages and, Challenges," *TEST* , (2007) 16: 42–46.

Gary Koop, *Bayesian Econometrics* (2003), Chap. 7, "The Linear Regression Model with Panel Data," pp.147-179.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 12, "Hierarchical Models," pp.169-190.

Simon Jackman, "Hierarchical Models," unpublished, Stanford University (2004), http://jackman.stanford.edu/mcmc/yale3pp.pdf .

D. V. Lindley; Melvin R. Novick, "The Role of Exchangeability in Inference," *The Annals of Statistics*, Vol. 9, No. 1. (Jan., 1981), pp. 45-58.

Supplementary

Tony Lancaster, "The incidental parameter problem since 1948," *Journal of Econometrics* 95 (2000) 391-413.

S. James Press: *Subjective and Objective Bayesian Statistics: Principles, Models, and Applications*, 2nd ed. (2003), Chap. 14, "Hierarchical Bayesian Modeling," pp.336-358 (by Alan M. Zaslavsky).

Andrew B. Gelman, John S. Carlin, Hal S. Stern, and Donald Rubin, *Bayesian Data Analysis* (1995), Chap.5, "Hierarchical Models," pp. 119-160; Chap.13, "Hierarchical Linear Models," pp366-383.

Peter Congdon, *Bayesian Statistical Modelling, 2nd ed.* (2007), Chap. 11, "Multilevel and Panel Data Models," pp.367-424.

S. K. Kinney and D. B. Dunson, " Fixed and Random Effects Selection in Linear and Logistic Models," *Biometrics*, (2007), pp. 1-9.

Terry E. Dielman, " Pooled Cross-Sectional and Time Series Data: A Survey of Current Statistical Methodology," *The American Statistician*, Vol. 37, No. 2. (May, 1983), pp. 111-122.

Michel Mouchart, *The Econometrics of Panel Data*, unpublished, Institut de statistique Université catholique de Louvain, May 14, 2007.
http://www.stat.ucl.ac.be/ISpersonnel/mouchart/DataPanelLink070507.pdf

Bruce M. Hill, "Inference about Variance Components in the One-Way Model," *Journal of the American Statistical Association*, Vol. 60, No. 311. (Sep., 1965), pp. 806-825.

Bruce Western,"Causal Heterogeneity in Comparative Research: A Bayesian Hierarchical Modelling Approach," *American Journal of Political Science*, Vol. 42, No. 4. (Oct., 1998), pp. 1233-1259.

Fernandez, et al., "On the use of panel data in stochastic frontier models with improper priors," *Journal of Econometrics*, 79: 169-193 (1997).

Gary Koop, et al., "Bayesian efficiency analysis through individual effects: hospital cost frontiers," *Journal of Econometrics*, 76 (1997) 77-105.

William M. Bolstat and Samuel Manda, "Investigating Child Mortality in Malawi Using Family and Community Random Effects: A Bayesian Analysis," *Journal of the American Statistical Association*, Vol. 96, No. 453, (Mar., 2001), pp. 12-19.

Andrew Gelman and Iain Pardoe, "Bayesian Measures of Explained Variance and Pooling in Multilevel (Hierarchical) Models," *Technometrics*; May 2006; 48, pp. 241-251.

Scott Zeger and M. Rezaul Karim,"Generalized Linear Models with Random Effects; A Gibbs Sampling Approach," *Journal of the American Statistical Association*, Vol. 86, No. 413. (Mar., 1991), pp. 79-86.

Tony Lancaster, " Orthogonal Parameters and Panel Data," *The Review of Economic Studies*, Vol. 69, No. 3. (July, 2002) , pp. 647-666.

Patrick J. Heagerty and Scott L. Zeger, " Marginalized Multilevel Models and Likelihood Inference," *Statistical Science*, Vol. 15, No. 1. (Feb., 2000), pp. 1-19.

Ranjini Natarajan and Robert E. Kass, "Reference Bayesian Methods for Generalized Linear Mixed Models," *Journal of the American Statistical Association*, Vol. 95, No. 449. (Mar., 2000), pp. 227-237.

Topic 6 (November 19): State Space Models and Time Series Analysis

Presenter: Beat

F. X. Diebold, L. Kilian, and M. Nerlove, "Time Series," PIER Working Paper 06-019, 2006. http://pier.econ.upenn.edu/Archive/06-019.pdf

Gary Koop, *Bayesian Econometrics* (2003), Chap. 8, "Introduction to Time Series: State Space Models," pp.181-207; Section 12.4.1, "Time Series Models," pp. 293-299.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 17, "Some Stationary Time Series Models,' pp. 297-317; Chap. 18, "Some Nonstationary Time Series Models," pp. 319-334.

Tony Lancaster, *Introduction to Modern Bayesian Econometrics* (2004), Chap. 8, "Instrumental Variables," pp. 311-341; Chap.9, "Some Time Series Models," pp. 342-358.

Supplementary

C. K. Carter and R. Kohn, "On Gibbs Sampling for State Space Models,´ *Biometrika*, Vol. 81, No. 3. (Aug., 1994), pp. 541-553.

Hisashi Tanizaki and Roberto S. Mariano, "Nonlinear and non-Gaussian state-space modeling with Monte Carlo simulations," *Journal of Econometrics*, 83 (1998) 263-290.

John Geweke and Hishashi Tanizaki, "Bayesian Estimation of State Space Models Using the Metropolis-Hastings Algorithm within Gibbs Sampling," *Computational Statistics and Data Analysis*, 37:151-170 (2001).

Leonard Knorr-Held, "Conditional Proposls in Dynamic Models," *Scandinavian Journal of Statistics*, 26:129-144 (1999).

Luc Bawens, Michel Lubrano and Jean-François Richard, *Bayesian Inference in Dynamic Econometric Models*, Oxford (1999). UMCP McKeldin Library Stacks | HB141 .B42 1999. Especially Chapters 6-9.

Christopher A. Sims, "Thinking about Instrumental Variables," unpublished, http://sims.princeton.edu/yftp/IV/IV.pdf

Jean-Michel Marin, Christian P. Robert, *Bayesian Core: A Practical Approach to Computational Bayesian Statistics*, Springer (2007), Chap. 7, "Dynamic Models," pp. 183-215.

Peter Congdon, *Bayesian Statistical Modelling, 2nd ed.* (2007),.Chap. 8, "Time Series Models," pp.241-295.

John Geweke, "Simulation-Based Inference for Economic Time Series," Working Paper 570, Federal Reserve Bank of Minneapolis, Research Department, http://www.minneapolisfed.org/research/WP/WP570.pdf

Glen Barnett, Robert Kohn, and Simon Sheather, "Bayesian estimation of an autoregressive model using Markov chain Monte Carlo," *Journal of Econometrics*, 74 (1996) 237-254.

Christopher A. Sims, "Bayesian Skepticism on Unit Root Econometrics," *Journal of Economic Dynamics and Control*, 12, 463-474 (1988). Downloadable copy at: http://www.minneapolisfed.org/research/common/pub_detail.cfm?pb_autonum_id=3

Christopher A. Sims and Harald Uhlig, "Understanding Unit Rooters: A Helicopter Tour," *Econometrica*, Vol. 59, No. 6. (Nov., 1991), pp. 1591-1599.

Harald Uhlig, " What Macroeconomists Should Know about Unit Roots: A Bayesian Perspective," *Econometric Theory*, Vol. 10, No. 3/4, Symposium Double Issue: Bayes Methods and Unit Roots. (Aug. - Oct., 1994), pp. 645-671.

James O. Berger and Ruo-yong Yang, " Noninformative Priors and Bayesian Testing for the AR(1) Model," *Econometric Theory*, Vol. 10, No. 3/4, Symposium Double Issue: Bayes Methods and Unit Roots. (Aug. - Oct., 1994), pp. 461-482.

Robert E. McCulloch and Ruey S. Tsay, " Bayesian Inference of Trend- and Difference-Stationarity," *Econometric Theory*, Vol. 10, No. 3/4, Symposium Double Issue: Bayes Methods and Unit Roots. (Aug. - Oct., 1994), pp. 596-608.

Jean-Pierre Florens, Sophie Larribeau and Michel Mouchart, "Bayesian Encompassing Tests of a Unit Root Hypothesis," *Econometric Theory*, Vol. 10, No. 3/4, Symposium Double Issue: Bayes Methods and Unit Roots. (Aug. - Oct., 1994), pp. 747-763.

Frank Kleibergen and Herman K. van Dijk, " On the Shape of the Likelihood/Posterior in Cointegration Models," *Econometric Theory*, Vol. 10, No. 3/4, Symposium Double Issue: Bayes Methods and Unit Roots.(Aug. - Oct., 1994), pp. 514-551.

Topic 7 (November 26): Latent Variables; Mixture Models; Limited and Qualitative Dependent Variables

Presenters: Yabei and Adan

Gary Koop, *Bayesian Econometrics* (2003), Chap. 9, "Qualitative and Limited Dependent Variable Models," pp209-233.

Gary Koop, Dale L. Poirier, Justin L. Tobias, *Bayesian Econometric Methods* ((2007), Chap. 14, "Latent Variable Models," pp.203-251; Chap. 15,"Mixture Models," PP. 253-279.

Supplementary

John F. Geweke , *Contemporary Bayesian Econometrics and Statistics* (2005), Chap.6, "Modeling with Latent Variables," pp.195-219.

Andrew B. Gelman, John S. Carlin, Hal S. Stern, and Donald Rubin, *Bayesian Data Analysis* (1995), Chap. 16, "Mixture Models," pp. 420-438; Chap. 17, "Models for Missing Data," pp. 439-455.

Peter Congdon, *Bayesian Statistical Modelling, 2nd ed.* (2007),.Chap. 6, "Discrete," pp.187-217; Chap. 7, "Multinomial and Ordinal Regression Models," pp. 219-240; Chap. 12, "Latent Variables and Structural Equation Models," pp. 425-455; Chap. 14, "Missing Data Models," pp. 493-531; Section 15.3, "Misclassification of Categorical Variables," pp. 541-545.

Jean-Michel Marin, Christian P. Robert, *Bayesian Core: A Practical Approach to Computational Bayesian Statistics,* Springer (2007), Chap.6, "Mixture Models," pp.147-181.

Robert E. Fay," Mixture Alternative Paradigms for the Analysis of Imputed Survey Data," *Journal of the American Statistical Association,* Vol. 91, No. 434. (Jun., 1996), pp. 490-498.

Harry H. Ku and Solomon Kullback, "Loglinear Models in Contingency Table Analysis," *The American Statistician,* Vol. 28, No. 4. (Nov., 1974), pp. 115-122.

Graham J. G. Upton, "The Exploratory Analysis of Survey Data Using Log-Linear Models" *The Statistician,* Vol. 40, No. 2, Special Issue: Survey Design, Methodology and Analysis. (1991), pp. 169-182.

Joseph B. Kadane, "Subjective Bayesian Analysis for Surveys with Missing Data, "*The Statistician,* Vol. 42, No. 4, Special Issue: Conference on Practical Bayesian Statistics, 1992. (1993), pp. 415-426.

Donald B. Rubin, "Multiple Imputation After 18+ Years," *Journal of the American Statistical Association,* Vol. 91, No. 434. (Jun., 1996), pp. 473-489.

Isaac Olayiwola Oshungade, "Some Methods of Handling Item Non-Response in Categorical Data," *The Statistician,* Vol. 38, No. 4. (1989), pp. 281-296.

James H. Albert and Siddhartha Chib, "Bayesian Analysis of Binary and Polychotomous Response Data," *Journal of the American Statistical Association,* Vol. 88, No. 422. (Jun., 1993), pp. 669-679.

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