Political Science 787: Multivariate Analysis

Fall 2008
Monday 12–2 (5664 HH)
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Course web page: `http://www.umich.edu/~wmebane/ps787.html`

Assignment Due Dates

due date	description	weight
TBA	several data analysis problems	75%
TBA	final take-home exam	25%

Reading Availability

Much of the course will refer to journal articles. I plan to follow or refer to a few chapters in the following.

Cameron, A. Colin, and Pravin K. Trivedi. 2005. *Microeconometrics: Methods and Applications.* Cambridge UP.

Class meeting and reading schedule

1. nonlinear models, MLE and asymptotics (Sep 15)
   - Cameron and Trivedi. Chapter 5 and Appendix A.
   - D. A. Freedman. 2006. On the so-called "Huber Sandwich Estimator" and "robust" standard errors. *The American Statistician* 60: 299–302.
2. selectivity (Sep 22)
   - Heckman, J. J. 1978. Dummy endogenous variables in a simultaneous equation system. *Econometrica* 46: 931–959.
   - Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica* 47: 153–161.
   - David A. Freedman and Jasjeet S. Sekhon. 2008. Endogeneity in Probit Response Models. Working paper.
   - Pratt, John W. 1981. Concavity of the Log Likelihood. *Journal of the American Statistical Association* 76(373): 103–106.
3. generalized linear models and QMLE (Sep 29)
   - White, Halbert. 1982. "Maximum Likelihood Estimation of Misspecified Models," *Econometrica* 50 (1): 1–25.
   - McCullagh, Peter. 1983. "Quasi-likelihood Functions." *Annals of Statistics* 11 (Mar.): 59–67.

4. bounded influence estimation (Oct 6)

    - Stefanski, Leonard A., Raymond J. Carroll, David Ruppert. 1986. Optimally Bounded Score Functions for Generalized Linear Models with Applications to Logistic Regression. *Biometrika* 73 (Aug): 413–424.
    - Hampel, Frank R. and Peter J. Rousseeuw and Elvezio Ronchetti. 1981. The Change-of-Variance Curve and Optimal Redescending M-Estimators. *Journal of the American Statistical Association* 76 (Sep): 643–648.
    - Croux, Christophe and Peter J. Rousseeuw and Ola Hossjer. 1994. Generalized S-Estimators. *Journal of the American Statistical Association* 89 (Dec): 1271–1281.
    - Mebane, Walter. R., Jr., and Jasjeet S. Sekhon. 2004. Robust Estimation and Outlier Detection for Overdispersed Multinomial Models of Count Data. *American Journal of Political Science* 48 (April): 392–411.

5. BUGS and MCMC (Oct 13, 27)

    - Brooks, S. P. 1998. Markov chain Monte Carlo method and its application. *The Statistician* 47: 69–100.
    - Brooks, S. P. and A. Gelman. 1998. Alternative methods for monitoring convergence of iterative simulations. *Journal of Computational and Graphical Statistics* 7: 434–455.
    - Spiegelhalter, D. J., N. G. Best, B. P. Carlin and A. van der Linde. 2002. Bayesian measures of model complexity and fit (with discussion). *J. Roy. Statist. Soc. B* 64: 583–640.
    - OpenBUGS. `http://mathstat.helsinki.fi/openbugs/`
    - The BUGS Project. `http://www.mrc-bsu.cam.ac.uk/bugs/`

6. bootstrap and refinements (Nov 3)

    - Cameron and Trivedi. Chapter 11.
    - Barndorff-Nielsen, O. E., and D. R. Cox. 1984. "Bartlett Adjustments to the Likelihood Ratio Statistic and the Distribution of the Maximum Likelihood Estimator," *Journal of the Royal Statistical Society. Series B (Methodological)* 46 (3): 483–495.

7. hypothesis tests (Nov 10)

    - Cameron and Trivedi. Chapter 7.
    - Vuong, Quang H. 1989. "Likelihood-ratio Tests for Model Selection and Non-nested Hypotheses." *Econometrica* 57 (2): 307–333.

8. random assignment (Nov 17)

    - Freedman, D. A. 2007. On regression adjustments to experimental data. In press, *Advances in Applied Mathematics*.
      `http://www.stat.berkeley.edu/users/census/neyregr.pdf`
    - D. A. Freedman. 2008. Randomization does not justify logistic regression. *Statistical Science* 23: 237–249.

- D. A. Freedman. 2008. On regression adjustments in experiments with several treatments. *Annals of Applied Statistics* 2: 176–196.

9. choice models (Nov 24)

    - McFadden, Daniel. 1974. "Conditional logit analysis of qualitative choice behavior." In P Zarembka, ed., *Frontiers of Econometrics*, New York: Acadmic Press. pages 105–142. `http://emlab.berkeley.edu/reprints/mcfadden/zarembka.pdf`
    - McFadden, Danel. 1981. "Structural Discrete Probability Models Derived from Theories of Choice." In Charles F. Manski and Daniel L. McFadden, eds, *Structural Analysis of Discrete Data and Econometric Applications*, Cambidge, MA: MIT Press, chapter 5, pp. 198–272.
    `http://emlab.berkeley.edu/discrete/ch5.pdf`

10. stategic choice models (Dec 1, 8)

    - McKelvey, Richard D., and Thomas R. Palfrey. 1995. Quantal Response Equilibria for Normal Form Games. *Games and Economic Behavior* 10: 6–38.
    - Goeree, Jacob K., and Charles A. Holt. 2005. An Explanation of Anomalous Behavior in Models of Political Participation. *American Political Science Review* 99 (May): 201–213.
    - Haile, Philip A., Ali Hortasu and Grigory Kosenok. 2007. On the Empirical Content of Quantal Response Equilibrium. Working paper.
    `http://www.econ.yale.edu/ pah29/qre.pdf`

Additional Reading

Here are some potentially useful books on **R**.

Crawley, Michael R. 2007. *The R Book*. Wiley.

Spector, Phil. 2008. *Data manipulation with R*. Springer.

Albert, Jim. 2007. *Bayesian Computation with R*. Springer.

Chambers, John M. 2008. *Software for Data Analysis*. Springer.

Braun, W. John, and Duncan J. Murdoch. 2007. *A First Course in Statistical Programming with R*. Cambridge.