Multi-Equation Models and Analysis

09-10 July (8 hours)

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Course description

This course is about statistical models of more than one equation, accounting for more than one dependent variable. We shall consider questions of modeling, estimation, and inference: What sorts of models imply—and should reflect hypotheses asserting—what sorts of effects? What variables—and equations—must we include? What assumptions must we make, and what do they mean? How likely are the assumptions to be violated, and with what consequences? When is a model identified (roughly, estimable), and what can be done when it's not? What quantities should we be focusing on estimating? What estimators provide statistically desirable estimates? Where several different estimators might serve, what are their advantages and disadvantages? What do the estimates tell us, and how certainly? This course may be taken as a companion to the course on Advanced Regression Models and Analysis or on its own.

Prerequisites

Statistics through regression models and analysis.

Schedule

Thursday, 09 July

- Seemingly unrelated regressions: model and assumptions, estimation
- Linear simultaneous equations: model and the assumptions
- Need and uses: when do we need these models, what can they tell us?
- Specification: what must be included, what can but needn't be?
- Basics of GLS (for SUR models) & 2SLS (for simultaneous eq. models)
- Lab: Applying GLS & 2SLS

Friday, 10 July

- Lab: Sharing & discussing results
- More on estimation: OLS, GLS, 2SLS, LIML, 3SLS, & FIML.
- Direct, indirect, and total effects: Definition, parsing, and estimation
- Identification: What it means, how to tell if you have it, how to achieve it
- Special Cases/Topics: Recursive and block-recursive models, models adding epistemic eqs.

Background Reading

Fisher, Franklin M. 1969. Causation and Specification in Economic Theory and Econometrics. Synthese, 20 (4): 489-500

Gujarati, Damodar N., Dawn C. Porter, and Sangeetha Gunasekar. 2017. Basic Econometrics (5th ed.). New York: McGraw-Hill. Ch. 18-20.

Maddala, G.S. and Kajal Lahiri. 2009. Introduction to Econometrics (4thed.). New York: Wiley. Secs. 9.3-9.6, 9.8-9.9.

Sobel, Michael E. "Direct and Indirect Effects in Structural Equation Models," in J. Scott Long (ed.), Common Problems/Proper Solutions: Avoiding Error in Quantitative Research. Beverly Hills, CA: Sage. Pp. 46-53 & Appendix A.

Luskin, Robert C. 1988. Standard Errors of Implied Total Effects., with an Excursus on Indirect Effects. Presented at the Political Methodology Conference, Duke University.

Kmenta, Jan. 1997. Elements of Econometrics (2nd ed.). Ann Arbor, MI: University of Michigan Press. Sec. 13.1, pp. 719-20.

Short biography of the instructor

Robert C. Luskin is Associate Professor of Government at the University of Texas at Austin, Visiting Affiliated Professor at CEVIPOF, *Sciences-Po*, Paris, and Research Advisor at the Center for Deliberative Democracy at Stanford University. He has been a Fellow at the Center for Advanced Study in the Behavioral Sciences at Stanford and has served on Editorial Boards of *Political Analysis* and the *American Political Science Review*. His general interests include public opinion, voting behavior, political psychology, and statistical methods, and he has long been particularly interested in the effects of political information on the texture and outcomes of representative democracy. He has published papers on these and other topics in the *American Political Science Review*, the *American Journal of Political Science*, the *Journal of Politics*, the *British Journal of Political Science*, *Political Analysis*, and other scholarly journals.