A. Colin Cameron (U.C. Davis)
Nonlinear Cross-section and Panel Regression Models for Count Data
Department of Economics, Queens University, Canada
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Course Objective

The course will cover regression methods for count data, such as number of doctor visits, where the dependent variable is a nonnegative integer. While the focus is on count data, most of the methods are applicable to nonlinear regression models in general , and the relevant general frameworks will be presented ahead of specialization to counts.

We will cover methods, theory, and applications. All methods will be carefully illustrated in full detail by applications to cross-section and panel count data examples.

Course Material

Slides, Stata programs and data are at cameron.econ.ucdavis.edu/canada2019
There is more material than I have time to cover.
I will be selective according to student background and interests.

Day 1: Cross-section data models.

The first lecture will focus on standard regression models for count data: quasi-ML estimation of the Poisson model, the closely related generalized linear models framework, and maximum likelihood estimation of the negative binomial model. Various marginal effects from these nonlinear models will be presented. Inference using heteroskedastic-robust and cluster-robust standard errors and appropriate bootstraps will be presented.

Day 2: Cross-section data models continued

The second lecture continues with more specialized models. Two-part models and with-zeros models control for excess zeros commonly-observed with count data. Finite mixture or latent class models are also more flexible parametric models. The lecture concludes with nonlinear two-stage least squares or generalized method of moments estimation of count models with endogenous regressors.

Day 3: Panel data models

The third lecture will focus on short panel data models where the number of cross-sectional units is large. We begin with random effects and fixed effects models for count data. We then present estimation of dynamic count data models that is a generalization of Arellano-Bond methods for linear models.

References

See the end of the first set of slides.