Dissertation Abstract

Three Essays in Econometrics

Suhyeon Nam
Michigan State University

Chapter I

Multiple Fractional Response Variables with Continuous Endogenous Explanatory Variables

Multiple fractional response variables have two features. Each response is between zero and one, and the sum of the responses for a unit is one. In this paper, I develop an estimation method not only accounting for these two features, but also allowing for endogeneity. It is a two step estimation method combining a control function approach. The first step generates a control function using a linear regression, and the second step maximizes a multinomial log likelihood function with a multinomial logit conditional mean which depends on the control function generated in the first step. Monte Carlo simulations examine the performance of the estimation method when the conditional mean in the second step is misspecified. The simulation results provide evidence that the method's average partial effects estimates approximate well true average partial effects as long as an instrument is not weak and that the method's approximation outperforms an alternative linear method's. I apply the proposed two step estimation method to Michigan's fourth grade math test data to estimate the average partial effects of spending on student performance.

Chapter II

Multiple Fractional Response Variables with a Binary Endogenous Explanatory Variable

This chapter extends the first chapter by allowing the endogenous explanatory variable to be binary. The two step estimation method in the first chapter is modified to use generalized residuals instead of the linear regression residuals. It is able to recognize the two features of the response variable - the bounded nature and the adding up constraint - and to handle the discrete nature of the endogenous explanatory variable as well. The simulation experiments where the two step method's model is misspecified demonstrate that it provides a decent approximation to true average partial effects and outperforms alternative methods when a weak instrument is in use.

Chapter III

On Computing Average Partial Effects in Models with Endogeneity or Heterogeneity (with Jeffrey M. Wooldridge)

We clarify some issues in computing average partial (or marginal) effects in models that have been estimated using control function or correlated random effects approaches (or some combination). In particular, we show that a common method of estimating average partial effects, where the averaging is done across all variables and across the entire sample, estimates an interesting parameter. Nevertheless, the method differs from averaging across the observed covariates the partial effects obtained via the average structural function. In the special case where unobservables are independent of the observed covariates the two methods are identical.