Introductory Microeconometrics

Econometrics of Qualitative Dependent Variables

Course Outline – Spring/Summer 2016

Course description: This course discusses a set of techniques that form a part of the core for microeconometrics. One can think of microeconometrics as doing econometrics while respecting the theoretical implications of microeconomics-type problems and applications. Alternatively, one can think of microeconometrics as econometrics that attempts to respect the nature of data collection and economic behavior. The course is pitched at an advanced undergraduate level and would involve reading some journal articles.

Main references include:

1. Angrist, Joshua D. and Jörn-Steffen Pischke. *Mostly Harmless Econometrics*. Princeton University Press, 2009.

2. Berndt, Ernst R. *The Practice of Econometrics: Classic and Contemporary*. Addison-Wesley Publishing Company, 1991.

3. Freedman, David A. *Statistical Models: Theory and Practice*, Revised ed. Cambridge University Press, 2005.

4. Verbeek, Marno. *A Guide to Modern Econometrics*, 4th ed. Wiley, 2012.

5. Wasserman, Larry. *All of Statistics: A Concise Course in Statistical Inference*. Springer, 2004.

6. Wooldridge, Jeffrey M. *Introductory Econometrics: A Modern Approach*, 6th ed. Cengage Learning, 2015.

Dates for the course:

- Mondays (May 2, 9, 23, 30; June 13; July 11) 14h-16h and 16h-18h

- Fridays (May 13; June 3, 10, 17; July 8) 14h-16h and 16h-18h

Course schedule: Our meetings will be roughly two hours each. These meetings are a combination of lectures, discussions, written exercises, and computer exercises. You are very much encouraged to hand in solutions to exercises for checking. We only have a final exam on July 15.

1. (2 meetings) Why do we have a separate field called microeconometrics? If microeconometrics is the answer, then what is the question? What makes microdata different from any other type of data?

   (a) Berndt: Background, Sections 11.1 and 11.2.A

   (b) Sections 1 to 3 of James Heckman's Nobel Lecture, `http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2000/heckman-lecture.pdf`

   (c) Theorem 1 of Horrace, W. A. and Oaxaca, R. L.. (2006). Results on the Bias and Inconsistency of Ordinary Least Squares for the Linear Probability Model. *Economics Letters*, 90(3), 321–327. `http://dx.doi.org/10.1016/j.econlet.2005.08.024`

2. (4 meetings) Do we have alternatives to least squares? What does the machinery look like?

(a) Wooldridge: Appendix C.4

(b) Verbeek: Sections 6.1 to 6.2

(c) Freedman: Section 7.1

(d) Wasserman: Chapter 9

3. (5 meetings) What if your dependent variable is a dummy?

(a) Wooldridge: Section 17.1

(b) Verbeek: Section 7.1

(c) Angrist and Pischke: Section 3.1 except 3.1.3

(d) Freedman: Sections 7.2 to 7.3

(e) Wasserman: Sections 22.1 to 22.5

(f) Sections I to III of Evans, W. N. and Schwab, R. M.. (1995). Finishing High School and Starting College: Do Catholic Schools Make a Difference?. *The Quarterly Journal of Economics*, 110(4), 941–974. http://www.jstor.org/stable/2946645

(g) Entire Horrace and Oaxaca (2006)

(h) Entire Ai, C. and Norton, E. C.. (2003). Interaction Terms in Logit and Probit Models. *Economics Letters*, 80(1), 123–129. http://dx.doi.org/10.1016/S0165-1765(03)00032-6

(i) Entire Greene, W.. (2010). Testing Hypotheses About Interaction Terms in Nonlinear Models. *Economics Letters*, 107(2), 291–296. http://dx.doi.org/10.1016/j.econlet.2010.02.014

4. (5 meetings) What if your dependent variable is essentially continuous but we imperfectly observe it?

(a) Wooldridge: Sections 17.2, 17.4, 17.5

(b) Verbeek: Sections 7.4 to 7.5

(c) Berndt: Section 11.3 except 11.3.D

(d) Angrist and Pischke: Section 3.4.2

(e) Entire Mroz, T. A.. (1987). The Sensitivity of an Empirical Model of Married Women's Hours of Work to Economic and Statistical Assumptions. *Econometrica*, 55(4), 765–799. http://doi.org/10.2307/1911029

5. (4 meetings) What about other types of qualitative dependent variables?

(a) What if your dependent variable takes on a finite number of values?

i. Verbeek: Section 7.2

(b) What if your dependent variable takes on a finite number of values but has some intrinsic order?

i. Verbeek: Section 7.2

(c) What if your dependent variable takes on nonnegative integer values?

i. Wooldridge: Section 17.3
ii. Verbeek: Section 7.3

6. (1 meeting) What seems to be missing? A lot actually – time for the truth.

(a) Entire Nobel lecture of James Heckman

(b) Existence issues of maximum likelihood

(c) All other "evils" – heteroscedasticity, endogeneity, measurement error, unobserved heterogeneity