EC535: EMPIRICAL PRELIMINARIES

Reading List 2011

The purpose of this first class is to (re)introduce you to some of the more common empirical methods used in development economics. Our aim is to establish a framework for thinking carefully about causal inference. You can think of it as basic survival skills. Throughout the course, we will begin to fill in some of this framework. However, development is a broad field, and our treatment of many of these topics will be unfortunately light. Those students interested in empirical research are strongly advised to explore in much greater depth the methods discussed in this lecture.

You should read the starred (*) items closely and know the double-starred (**) items intimately.

1. **Background & Introduction**
   - Popper, K. 1953. "Science: Conjectures and Refutations." Lecture given at Peterhouse, Cambridge.
     http://philosophyfaculty.ucsd.edu/faculty/rarneson/Courses/popperphil1.pdf
     It's good to remind ourselves what science means.
   - Holland, P. 1986. "Statistics and Causal Inference." *Journal of the American Statistical Association* 81(396):945-60.
   - *Duflo, E., Glennerster, R. & Kremer, M., 2007. "Using randomization in development economics research: A toolkit." *Handbook of Development Economics*, 4, 3895–3962.
     http://linkinghub.elsevier.com/retrieve/pii/S1573447107040612.
     Sections 1 and 2 provide good background on the identification problem.
   - *Angrist, J.D., and J.S. Pischke. 2010. The credibility revolution in empirical economics: how better research design is taking the con out of econometrics. *The Journal of Economic Perspectives* 24, no. 2: 3–30.
     http://www.ingentaconnect.com/content/aea/jep/2010/00000024/00000002/art00001.
   - Meyer, B.D. 1995. Natural and quasi-experiments in economics. *Journal of business & economic statistics* 13, no. 2: 151–161.
     http://www.jstor.org/stable/1392369.
2. **Selection on observables**
   - Imbens & Wooldridge, Sections 5.1-5.4, 5.6, 6.1, 6.2
   - Angrist & Pischke, Sections 3.3, 3.4, 5.3, 8.2
     And follow the extensive references in both texts
3. **Useful textbooks & guides**
   - **Angrist, J.D., and A.B. Krueger. 1999. Empirical strategies in labor economics. *Handbook of labor economics* 3: 1277–1366.
     http://linkinghub.elsevier.com/retrieve/pii/S1573446399030047.
     This is the granddaddy of background readings in empirical methods. Read it.

- **Angrist, J.D., and J.S. Pischke. 2009. *Mostly harmless econometrics: an empiricist's companion*. Princeton University Press.
  This book is a wonderful, intuitive guide to empirical work. Buy it and read often.
- *Imbens, G.W., and J.M. Wooldridge. 2009. Recent developments in the econometrics of program evaluation. *Journal of Economic Literature* 47, no. 1: 5–86. http://www.ingentaconnect.com/content/aea/jel/2009/00000047/00000001/art00001.
- Wooldridge, J.M. 2002. *Econometric analysis of cross section and panel data*. Cambridge: The MIT press.
- Deaton, A. 1997. *The analysis of household surveys: a microeconometric approach to development policy*. World Bank Publications.
  The first two chapters.
- Cameron, A.C., and P.K. Trivedi. 2005. *Microeconometrics: methods and applications*. Cambridge University Press
  A clear text with examples and up-to-date techniques. Very useful.

4. Randomized control trials

- Duflo, E., Glennerster, R. & Kremer, M., 2007. "Using randomization in development economics research: A toolkit." *Handbook of Development Economics*, 4, 3895–3962. http://linkinghub.elsevier.com/retrieve/pii/S1573447107040612.
  A good starting point for all things RCT. Also excellent for follow on references
- Banerjee, A.V., and E. Duflo. 2008. The experimental approach to development economics. *NBER Working Paper*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1297697.
- Banerjee, A.V., and E. Duflo. 2010. Giving Credit Where it is Due. *The Journal of Economic Perspectives* 24, no. 3: 61–79. http://www.ingentaconnect.com/content/aea/jep/2010/00000024/00000003/art00005.
- Bruhn, M. and D. McKenzie (2008). "In pursuit of balance: Randomization in practice in development field experiments." BREAD Working Paper No. 189. http://ipl.econ.duke.edu/bread/papers/working/189.pdf
  You can also read the published version from the American Economic Journal: Applied Micro (2009).
- Rodrik, D. The new development economics: we shall experiment, but how shall we learn?. *papers.ssrn.com*. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1296115.
- Deaton, A. (2009). Instruments of development: Randomization in the tropics, and the search for the elusive keys to economic development. NBER Working Paper No. 14690. http://www.nber.org/papers/w14690.
- Imbens, G. (2009). Better LATE than nothing: Some comments on Deaton (2009) and Heckman and Urzua (2009). NBER Working Paper No. 14896. http://www.nber.org/papers/w14896.

5. Differences in Differences

- *Angrist & Pischke, Section 5.2

- *Bertrand, M, E Duflo, and S Mullainathan. 2004. How Much Should We Trust Differences-in-Differences Estimates? *Quarterly Journal of Economics* 119, no. 1: 249-275. http://www.mitpressjournals.org/doi/abs/10.1162/003355304772839588.
- Imbens & Wooldridge, Section 6.5
- Campbell, D.T. 1969. Reforms as experiments. *American psychologist* 24, no. 4: 409–429. http://www.notjustvalueadded.org/Documents/CEM/publications/downloads/CEMWeb027 Reforms As Experiments.pdf.
- Card, D., and A.B. Krueger. 2000. Minimum wages and employment: a case study of the fast-food industry in New Jersey and Pennsylvania. *American Economic Review* 90, no. 5: 1397–1420. http://www.jstor.org/stable/2677856.
  An often cited example and interesting economics as well.
- Morduch, J. 1998. Does microfinance really help the poor? New evidence from flagship programs in Bangladesh. Harvard University Institute for International Development, *mimeo*. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.29.6311&rep=rep1&type=pdf.
  We will discuss this in lecture during the Lent term, but it also provides a good example of challenges to diff-in-diffs estimators.
- Duflo, Esther. 2001. Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment. *American Economic Review* 91, no. 4: 795-813.

6. Instrumental Variables

- Angrist & Pischke, Section 4
- Imbens & Wooldridge, Section 6.3
- *Angrist, J.D., and A.B. Krueger. 2001. Instrumental variables and the search for identification: From supply and demand to natural experiments. *Journal of Economic Perspectives*: 69–85. http://www.jstor.org/stable/2696517.
- *Angrist, Joshua D, and Guido Imbens. 1994. Identification and Estimation of Local Average Treatment Effects. *Econometrica* 62, no. 2: 467-475.
- *Angrist, JD, GW Imbens, and DB Rubin. 1996. Identification of causal effects using instrumental variables. *Journal of the American Statistical Association*. http://www.questia.com/PM.qst?a=o&se=gglsc&d=5002269527.
- Angrist, J.D. 1990. Lifetime earnings and the Vietnam era draft lottery: evidence from social security administrative records. *The American Economic Review* 80, no. 3: 313–336. http://www.jstor.org/stable/2006669.
- Angrist, J.D. 1998. Estimating the labor market impact of voluntary military service using social security data on military applicants. *Econometrica* 66, no. 2: 249–288. http://www.jstor.org/stable/2998558.
- Hahn, J., and J. Hausman. 2003. Weak instruments: diagnosis and cures in empirical econometrics. *American Economic Review* 93, no. 2: 118–125. http://www.jstor.org/stable/3132211.

- Heckman, James J. & Urzua, Sergio, 2009. "Comparing IV with Structural Models: What Simple IV Can and Cannot Identify," IZA Discussion Papers 3980, Institute for the Study of Labor (IZA). http://ftp.iza.org/dp3980.pdf
- Staiger, D., and J.H. Stock. 1997. Instrumental variables regression with weak instruments. *Econometrica: Journal of the Econometric Society* 65, no. 3: 557–586. http://www.jstor.org/stable/2171753.
- Murray, M. P. 2006. "Avoiding Invalid Instruments and Coping with Weak Instruments." *Journal of Economic Perspectives*. 20 (4):111-32.
- Hirano, K., G. Imbens, DB Rubin, and XH Zhou. 2000. Estimating the effect of an influenza vaccine in an encouragement design. *Biostatistics* 1: 69–88.
  This also highlights encouragement designs, a useful technique for a form of RCTs

7. Matching and Propensity Scores

- Imbens & Wooldridge, Sections 5.5, 5.8
- Angrist & Pischke, Sections 3.3, 3.4
- Abadie, A., D. Drukker, J.L. Herr, and G.W. Imbens. 2004. Implementing matching estimators for average treatment effects in Stata. *Stata Journal* 4: 290–311. http://www.infra.kth.se/cesis/cesis/education/master/courses/1n1705/sj.pdf#page=68.
- Abadie, A., and G.W. Imbens. 2006. Large sample properties of matching estimators for average treatment effects. *Econometrica* 74, no. 1: 235–267. http://www3.interscience.wiley.com/journal/118559197/abstract.
- Heckman, J.J., H. Ichimura, and P. Todd. 1998. Matching as an econometric evaluation estimator. *Review of Economic Studies* 65, no. 2: 261–294. http://www3.interscience.wiley.com/journal/119112789/abstract.
- Dehejia, Rajeev H, and Sadek Wahba. 1999. Causal Effects in Nonexperimental Studies: Reevaluating the Evaluation of Training Programs. *Journal of the American Statistical Association* 94, no. 448: 1053-1062.
- Arceneaux, K., A.S. Gerber, and D.P. Green. 2006. Comparing experimental and matching methods using a large-scale field experiment on voter mobilization. *Political Analysis* 14, no. 1: 37–62.
  http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.136.8988&rep=rep1&type=pdf.
  Most interesting for a nice comparison of various estimation techniques.

8. **Regression discontinuity**

- Imbens & Wooldridge, Section 6.4
- Angrist & Pischke, Section 6
- *Imbens, G.W., and T. Lemieux. 2008. Regression discontinuity designs: A guide to practice. *Journal of Econometrics* 142, no. 2: 615–635. http://linkinghub.elsevier.com/retrieve/pii/S0304407607001091.
- Hahn, J, P Todd, and W Van der Klaauw. 2001. Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica*.

- Klaauw, W Van der. 2002. Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression–Discontinuity Approach. *International Economic Review*.
- Angrist, J.D., and V. Lavy. 1999. Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement. *Quarterly journal of economics* 114, no. 2: 533–575. http://www.mitpressjournals.org/doi/abs/10.1162/003355399556061**.**

9. Measurement Errors, Missing Data and Other Issues

- Hyslop, D.R., and G.W. Imbens. 2001. Bias from classical and other forms of measurement error. *Journal of Business and Economic Statistics* 19, no. 4: 475–481. http://pubs.amstat.org/doi/abs/10.1198/07350010152596727.
- Hausman, J.A., and D.A. Wise. 1979. Attrition bias in experimental and panel data: the Gary income maintenance experiment. *Econometrica: Journal of the Econometric Society* 47, no. 2: 455–473. http://www.jstor.org/stable/1914193.
- Lee, DS. 2009. Training, wages, and sample selection: Estimating sharp bounds on treatment effects. *Review of Economic Studies* 76, no. 3: 1071-1102.
  For practical implementation, you may find Lee's "Trimming for Bounds" NBER working paper from 2002 more useful.
- Drexler, A, G. Fischer, A. Schoar ""Keeping it Simple: Financial Literacy and Rules of Thumb." CEPR Discussion Paper 7994. http://personal.lse.ac.uk/fischerg/Assets/Drexler%20Fischer%20Schoar%20-%20Keep%20it%20Simple.pdf
  Shows a practical application of bounds estimation with sample attrition.

10. Stata Resources

- Cameron, A.C., and P.K. Trivedi. 2009. *Microeconometrics using stata*. Stata Press.
  This is the Stata companion to their textbook. It is excellent and I cannot recommend it highly enough for folks wanting to do applied work.
- Khandker S., G.B. Koolwal, H.A. Samad. 2010. Handbook on impact evaluation: quantitative methods and practices. World Bank.
  Part 2 has clear STATA exercises that we may use for parts of the EC535 course. However, it is important to recognize that the book is uncritical in its citation of empirical work.
- The UCLA STATA Portal (http://www.ats.ucla.edu/stat/stata/default.htm)
- Various other online STATA introductions. *I like the one from Princeton, but this is largely a matter of personal taste.*

11. **Good econometrics**

This is just a section of some very readable papers demonstrating excellent empirical work, in other words, stuff you should read but which didn't have a natural home elsewhere in the list.

- Card, D. 1999. The causal effect of education on earnings. *Handbook of labor economics* 3: 1801–1863. http://emlab.berkeley.edu/users/card/papers/causal_educ_earnings.pdf
- LaLonde, R.J. 1986. Evaluating the econometric evaluations of training programs with experimental data. *The American Economic Review* 76, no. 4: 604–620.

http://www.jstor.org/stable/1806062.
Could fit in a number of sections and is often considered the point of departure for much of the move towards field experiments