POLS7020: Policy Analysis and Evaluation (15 credits)

Module leaders: Lorraine Dearden, Sam Sims
Tutor: Philipp Broniecki

This interdisciplinary module introduces students to quantitative evaluation methods and their use in policy analysis in the social sciences. The course will emphasise the application of experimental and quasi-experimental evaluation methods in the 'real world', and it potential impact upon government policy. Students will learn about key elements of evaluation methods, and be able to critically evaluate their strengths and weaknesses. The course has a high practical element, with students regularly analysing data using R. Topics to be covered include randomised control trials, regression methods, regression discontinuity designs, and difference-in-difference methods. Upon completing the course, students will be able to interpret and critique the results and quality of research using experimental and quasi-experimental evaluation methods and to critically consume empirical research.

Students will be engaged in formative assessment exercises throughout the module and complete class exercises (20% of the marks) and summative assessment will be a 2 ¼ hour (3 questions) exam in the summer term, accounting for 80% of the final mark for this module.

Course Aims

This course considers methods for quantifying the causal impacts of social and economic programmes in both the government and non-government sectors. How many more people are in work because of a policy to help those on the margins of the labour market? Does including a free pen in a charity mail shot increase the probability of response? Does more education for girls in developing countries promote child outcomes in the next generation? The course covers a range of experimental and quasi-experimental methods of impact evaluation that can be used to answer such questions, in and outside government:

- Regression methods in a policy evaluation context
- randomised control trials ('field experiments')
- 'Before and after' and 'difference in differences'
- regression discontinuity design

Learning Outcomes and Key Skills

After successful completion of this course, participants will have the following learning outcomes and key skills:

- understand issues in designing and using randomised control trials and have the practical and technical skills to use these methods to design, run and analyse the causal impact of a randomised control trial
- understand the principles and techniques underlying a range of different types of quasi-experimental evaluation/research and have the

understanding and statistical skills to carry out an evaluation using quasi-experimental methods

- interpret and critique the results and quality of research using experimental and quasi-experimental evaluation methods and to critically consume empirical research

Module Organisation and Administration

The module is taught by a mixture of lecture and practical/seminar sessions that are practical in nature. The 2 hour sessions will take every Wednesday during Second Term at 11am in Room B19, Drayton House. The Lecturers are Lorraine Dearden (LD) and Sam Sims (SS) and tutorial/practical elements will be taken by Philipp Broniecki. Attendance at the lectures is compulsory. Lectures topics may change order but students will be given advance warning. We will hold a separate revision class before the end of year exam. There will be two class exercises/problem sets that will each be worth 10% of the final mark (20% in total). The first will be on regression methods in evaluation which will be handed out on Wednesday 24th January and due on Friday 9th February. The second exercise will be on using Regression Discontinuity Design and will be handed out on Wednesday 7th March and will be due on Friday 23 March. All practical exercises will be done in R.

Background Reading

A guide to material for each lecture is given under the detailed lecture guide. Participants wishing to familiarise themselves before the course with some examples of impact evaluation might wish to begin by consulting. The main textbook for the course is Angrist and Pischke (2015) 'Mastering Metrics':

Angrist J and Pischke J-S (2015), *Mastering 'Metrics: The Path from Cause to Effect,* Princeton University Press [strong on RCT, DiD, RDD, regression methods, accessible with nice policy applications]. TEXTBOOK FOR COURSE

Purdon S, Lessof C, Woodfield K and Bryson C (2001) 'Research Methods for Policy Evaluation', DWP Social Research Division Working Paper 2 http://research.dwp.gov.uk/asd/asd5/WP2.pdf [A good non-technical survey]

Ravallion M (2001), 'The Mystery of the Vanishing Benefits: An Introduction to Impact Evaluation', *World Bank Economic Review*, 15 (1): 115-40. Also World Bank Policy Research Working Paper 2153; [A non-technical introduction to various methods using a hypothetical example of poverty reduction in a developing country] http://papers.ssrn.com/sol3/papers.cfm?abstract_id=620612.)

Gertler, P, Martinez, S, Premand, P, Rawlings, L, and Vermeersch C (2011) *Impact Evaluation in Practice*, Washington DC: The World Bank (free download – type title into Google).

Texts (For those wanting to delve more deeply)

Angrist J and Pischke J-S (2009), *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press [strong on regression methods, rigorous]

Shadish, W.R., Cook, T.D. and Campbell, D.T. (2002) *Experimental and Quasi-experimental designs for Generalized Causal Inference*. Boston: Houghton Mifflin. [Covers key design issues in evaluation and is an excellent and much cited text, although contains little on data analysis]

Morgan, S L. and Winship C (2007) *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Cambridge, UK: Cambridge University Press (see also their 1999 review paper in *Annual Review of Sociology*, 25: 659–706*)*. [A nice alternative to Shadish et al, also much cited. More technical.]

Gertler, P., Martinez, S., Premand, P., Rawlings, L., and Vermeersch C. (2011) *Impact Evaluation in Practice*, Washington DC: The World Bank (available for free download – type title into Google). [Broad coverage, not technical] http://siteresources.worldbank.org/EXTHDOFFICE/Resources/5485726-1295455628620/Impact_Evaluation_in_Practice.pdf

The World Bank (2003) *Toolkit for Evaluating the Poverty and Distributional Impact of Economic Policies* [see especially Ch 5 by M Ravallion, 'Assessing the Poverty Impact of an Assigned Program' which covers experimental and a range of quasi-experimental methods. Type 'worldbank impact toolkit' into Google.

Cartwright N and Hardie J (2012) *Evidence Based Policy: A Practical Guide to Doing it Better*, Oxford University Press [a skeptical counter-blast to the surge in popularity of RCTs]

Survey papers

Imai, K, King, G and Stuart E (2008) 'Misunderstandings between experimentalists and observationalists about causal inference' *Journal of the Royal Statistical Society*, Series A, 171 (2): 481–502 [Excellent rigorous comparison of experimental and non-experimental methods]

Imbens and Wooldridge (2009), 'Recent Developments in the Econometrics of Program Evaluation', *Journal of Economic Literature*, 47:1, 5–86. [Another rigorous comparison of experimental and non-experimental methods set up using the Rubin Causal Model. Very technical in places but has interesting insights into the evaluation problem].

Card D, Ibarraran P, and Miguel Villa, J (2011) 'Building in an Evaluation Component for Active Labor Market Programs: A Practioner's Guide' IZA Discussion Paper No. 6085 http://ftp.iza.org/dp6085.pdf [A non-technical-guide from a leading US labour economist – Card – that focuses on RCTs and difference-in-differences.]

Lectures 1 - 3: Policy Analysis, the Evaluation Problem and recasting Regression Analysis in a policy framework (LD) (10th Jan, 17th Jan and 24th Jan)

Aims

- To become familiar with the key features of the "evaluation problem"
- To understand the concept of causality, and the difference between the causal effect of a programme and the non-causal effect
- To understand the concept of the counterfactual and its relevance to the evaluation problem
- To understand the concept and importance of selection and composition bias and why naïve estimates of impact are unlikely to obtain causal impact
- To understand the difference between the Average Treatment Effect and Average Treatment effect on the treated
- To show how simple regression (matching) methods can be used to estimate causal impact
- To discuss under what conditions simple regression methods can be used to obtain causal impact
- To look at more advanced regression techniques that allow for heterogeneity in treatment effects
- To understand the importance of having good data when using matching methods
- To understand propensity score matching.

Seminar session

Students will be led through a task exploring data using some of the regression methods and matching methods discussed in the lecture.

Reading

Angrist J and Pischke J-S (2015), *Mastering 'Metrics: The Path from Cause to Effect,* Princeton University Press, Chapters 1 and Chapter 2

Angrist, D.J and Pischke, J-S (2008), 'Mostly Harmless Econometrics: An Empiricist's Companion', Princeton University Press, Chapers 1, 2 and 3

Imbens and Wooldridge (2009), 'Recent Developments in the Econometrics of Program Evaluation', *Journal of Economic Literature*, 47:1, 5–86 , Chapter 5.

Dearden, L., Emmerson, C., Frayne C. and Meghir, C., (2009), "Conditional cash transfers and school dropout rates", *Journal of Human Resources*, 44(4): 827–857.

Angrist, D.J and Pischke, J-S (2008), 'Mostly Harmless Econometrics: An Empiricist's Companion', Princeton University Press, Chapters 1 and 2

One or two of the survey articles in general reading list.

Lectures 4-6: Randomised Controlled Trials : Theory, design and analysis issues (SS) (31st January, 7th February, 21st February)

Aims

- To understand what the 'perfect' RCT would look like…..
- To understand ways of conducting the randomisation….
- To understand basic methods of analysis (and calculating effect sizes)…
- Deciding upon the appropriate control condition….
- The challenges in the social sciences with measuring outcomes…
- To understand what is meant by 'statistical power' and how to perform basic 'power calculations'
- To be introduced to 'clustered' randomised controlled trials, and their uses in the social sciences
- To understand what is meant by 'Intention-to-Treat' analysis, 'Contamination Adjusted Intention-to-Treat analysis' and 'Per-Protocol' analysis
- Gain experience of analysing RCT data using R

Seminar session

Students will be assigned a computer workshop task where they will be asked to analyse data from an RCT using R.

Reading

Angrist J and Pischke J-S (2015), *Mastering 'Metrics: The Path from Cause to Effect,* Princeton University Press, Chapter 1

Torgerson, D and Torgerson, C. 'Designing Randomised Trials in Health, Education and the Social Sciences. An introduction' Palgrave Macmillian, Chapters 3, 4, 10, 13 and 14

Lectures 7-8: Regression Discontinuity Design (LD) (28th February and 7th March)

Aims

- To understand the intuition behind RDD
- To understand when RDD is an appropriate methodology for evaluation

- To be familiar with the key concepts within RDD, such as forcing variables, assignment, thresholds
- To understand basic methods of analysis and different types of RDD (e.g. sharp RDD, fuzzy RDD)
- Become familiar with appropriate validity tests
- To understand what can be identified, and the strengths and limitations of RDD
- Gain experience of performing an RDD data using R

Seminar session

Students will be given some real data to get experience of performing RDD using R.

Reading

Angrist J and Pischke J-S (2015), *Mastering 'Metrics: The Path from Cause to Effect,* Princeton University Press, Chapter 4

Imbens, G. and Lemieux, T. (2007) Regression Discontinuity Designs: A Guide to Practice, NBER Working Paper No. 13039.

Lee, S and Lemieux, T (2009) 'Regression discontinuity designs in economics', NBER working paper 14723 http://www.nber.org/papers/w14723

Lee, D.S.(2001), 'The Electoral Advantage to Incumbency and Voters' Valuation of Politicians' Experience: A Regression Discontinuity Analysis of Elections to the U.S', NBER working paper 8841 http:/www.nber.org/papers/w8441

Shadish, W.R., Cook, T.D., and Campbell, D.T. (2010) Experimental and quasi-experimental designs for generalized causal inference, Boston: Cengage Learning.

Jacob, R and Zhu, P (2012) 'A practical guide to regression discontinuity', MDRC http://www.mdrc.org/sites/default/files/regression_discontinuity_full.pdf

Lectures 9-10: Before and After and Difference in Difference Methods (SS) (14th and 21st March)

Aims

- To understand the strengths and weaknesses of Before and After and Difference in Difference methods
- To understand the circumstances under which these methods control for selection on unobservables
- To understand the importance of the common trend assumption in Difference in Difference estimation
- Understand how do undertake Difference in Difference estimation with repeated cross sections and panel data

Seminar session

- Students will be given some real data to look at how to perform before and after and DiD methods in R.

Reading

Angrist J and Pischke J-S (2015), *Mastering 'Metrics: The Path from Cause to Effect,* Princeton University Press, Chapter 5.

Justin B. Dimick and Andrew M. Ryan (2014) , "Methods for Evaluating Changes in Health Care Policy: The Difference-in-Differences Approach", JAMA December 10, 2014 Volume 312, Number 22
https://jamanetwork.com/journals/jama/fullarticle/2020357

Card, David and Alan Krueger (1994): "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania", *American Economic Review* 84(4), pp. 772–793.

Dynarski, Susan M. 2003. "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion ." *American Economic Review*, 93(1): 279-288.