

**EIB E247: Economic Development and Econometric Impact Evaluation**  
**The Fletcher School, Tufts University**  
**Fall 2012**  
**Location: M235, M-W, 11:05-12:20**

**Instructor's Information:**

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For any questions about concepts, assignments or data, please sign up for office hours. If you cannot make office hours during the pre-assigned time slot, please e-mail Professor Aker with the header "Office Hours Meeting". Professor Aker will not be able to respond to individual e-mails with questions about readings, class concepts, assignments or tests.

**Course Objectives:**

One of the primary challenges for policymakers, development practitioners, donors and non-governmental organizations is understanding what policies and interventions are the most effectiveness in improving the welfare of the world's poor. While monitoring and evaluation (M&E) is useful in determining whether a program is on the "right track", this does not tell us whether a particular intervention, policy change or program actually *causes changes* in development outcomes. Yet such information is crucial in the context of limited financial and human resources.

The objective of this course it to provide students with a set of theoretical, econometric and practical skills to estimate the causal impact of a policy or program, with a particular focus on development programs. Examples will be drawn from a variety of sectors, including agriculture, health, education, markets, microfinance and governance. The course will also attempt to go beyond estimating the simple causal effect (often termed the "black box" of impact evaluation) to identifying the channels and mechanisms through which the causal effect was achieved.

The course will introduce students to a variety of econometric techniques in impact evaluation and a set of analytical skills that will assist them in becoming both consumers and producers of applied empirical research in development. Students will not only learn how to critically analyze evaluation research and gauge how convincing it is in establishing a causal relationship, but also use these skills to conduct an impact evaluation of an existing development project. The curriculum will be very applied.

## **Learning Outcomes:**

By the end of this course, a student should be able to:

- Understand the value and practice of impact evaluation within the development community.
- Understand and apply a variety of quantitative methods for estimating the impact of a development program, including randomized evaluations, quasi-experimental designs (regression discontinuity design and difference-in-differences) and non-experimental approaches (matching and instrumental variables)
- Critically analyze impact evaluation research and gauge the validity of the findings
- Understand and apply evaluation design for development projects
- Calculate the costs and benefits to different development interventions
- Analyze existing data from a development project using impact evaluation techniques

## **Pre-requisites:**

*Introductory econometrics (EIB E213) or an equivalent intermediate econometrics course is required. Econometrics may not be taken concurrently with this course, as lectures and assignments will assume a certain level of econometrics and STATA that will not be covered until later in the semester in EIB E213. All relevant econometric concepts will be reviewed as they arise, but the reviews will be brief.*

## **Methods of Instruction:**

Concepts will be presented in class via lectures and case studies, which will also serve as the basis for class discussion and small group activities. Lectures will present key topics and summaries of the readings and will be posted on Trunk *on the day of class*. Case studies will highlight research from Africa, Asia, and South America and cover programs related to agriculture, education, governance, health and microfinance. Group work (in terms of problem sets and a group project) will provide hands-on experience with research design and data analysis.

## **Requirements and Grading:**

There will be four practical problems sets, two exams and one group research project. Grades will be calculated based upon the following criteria:

Problem sets:	25%
Exams:	35%
Final project:	40%

While technical concepts and readings will be presented in lecture, other aspects of the course will focus on a discussion of the readings. Students are expected to prepare for class by completing the required readings before each class, attending each class and actively participating in class discussion. A formal grade will not be provided for participation, but full and thoughtful class participation (ie, a meaningful contribution to critiques and ideas discussed in class) will improve your grade if you are on the margin (ie, an A from an A-, an A- from a B+).

The problem sets will be posted on Trunk and due 7-10 days later. These problem sets can be submitted in a group of no more than five people.

The research project will be due at the end of the semester, with intermediate deliverables throughout the semester. The two main deliverables for the research project will be a presentation and a consultancy report. Students will be offered a choice of datasets from field projects from different international organizations, as well as the necessary program documents (project document, results framework, indicators, questionnaires and the evaluation reports). The group will:

- Review the necessary program documents, logical framework and evaluation data
- Choose at least one (1) aspect of the project on which to analyze the causal impact
- Clean the project dataset
- Analyze the impact of the program using one or more of the econometric impact evaluation techniques learned in class
- Present the findings to outside reviewers in a colloquium
- Write a group consultancy report for the organization in question, summarizing the findings and their group's recommendations for future evaluations of the project (but avoiding technical jargon)

This group project should be thought of as an ***in-class consultancy for an actual development organization***. Certain organizations (the World Bank, IFPRI, IRC, CRS) have kindly agreed to share their datasets and program documents with the class, and they have identified a contact person who can answer necessary questions (within reason). For this reason, we are unable to share these datasets with other parties without the permission of the organization, and we cannot share our findings with other individuals (other than the organization).

Certified auditors will be accepted *depending upon the class size*. Auditors will need to attend each class, complete the readings and hand in all problem sets.

### **Incubator Course for the Capstone Project**

As of the 2012/2013 academic year, Fletcher has moved to a capstone project to replace the traditional thesis. EIB E247 is an “incubator course” for the capstone project. Students who are interested in using their final project for their capstone requirements will need to build upon their group work (presentation and group consultancy report) and write a 25-page econometric research paper. The paper should use the group analysis as a basis, but will need to significantly expand upon the econometric analysis and use technical jargon.

### **Texts and Reading Materials:**

This course will draw heavily from the following readings:

Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, and Christel M. J. Vermeersch "Impact Evaluation in Practice". Washington, D.C.: World Bank Publications. [www.worldbank.org/ieinpractice](http://www.worldbank.org/ieinpractice). (GMPRV in the reading list below).

Khander, Shahidur R., Gayatri B. Koolwal and Hussain A. Samad. 2010. *Handbook on Impact Evaluation: Quantitative Methods and Practices*. The World Bank: Washington, D.C. (KKH in the reading list below).

Angrist, Joshua D. and S. Pischke. 2009. *Mostly Harmless Econometrics: An Empiricists' Companion*. Princeton, NJ: Princeton University Press (MHE in reading list below).

Ravallion, Martin. 2008. "Evaluating Anti-Poverty Programs", Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. Elsevier: Amsterdam, The Netherlands.

The first two documents provide a nice overview of impact evaluation and are, in general, quite intuitive (although the second document is more technical than the first). However, you cannot and should not rely on these documents alone; you need to read carefully and understand the "econometric language of impact evaluation" that is presented in the final two documents, as well as more technical readings. MHE is available at the Coop in Harvard and online for a reasonable price. The Ravallion reading will be uploaded onto Trunk.

Each class will also draw on several technical and applied readings as specified in the syllabus. Students are responsible for reading the required materials (marked with a \*) and are encouraged to read the recommended readings, some of which will be used for in-class case studies. If a required reading is not posted on Trunk, it can be downloaded from the relevant online journal via the Tufts library.

### **Important or Unusual Dates**

Due to some travel for fieldwork, there will be one (1) class during the semester that will not be held. We will make up this class during an additional class at the end of the semester. While the official final class of the semester is on Monday, December 10<sup>th</sup>, due to the nature of the final project, we will have a colloquium on Friday, December 7<sup>th</sup>, which will last most of the day. This is an additional class and attendance at this last class is required. Please note this date accordingly.

Monday, October 8th:	No class because of school holiday
Wednesday, October 10 <sup>th</sup> :	No class because of Aker travel
Monday, November 12 <sup>th</sup> :	No class because of school holiday
Friday, December 7 <sup>th</sup> :	Colloquium class
Monday, December 10 <sup>th</sup> :	Last class

## Course Outline

### I. Introduction to impact evaluation in economic development

\*GMPRV, Chapters 1 and 2.

\*KKH, Chapter 2.

\*Glewwe, Paul, Michael Kremer, Sylvie Moulin and Eric Zitzewitz. 2004. "Retrospective versus Prospective Studies of School Inputs: The Case of Flip Charts in Kenya." *Journal of Development Economics* 74(2004): 251-268.

[http://www.povertyactionlab.org/sites/default/files/publications/10\\_Kremer\\_Flip\\_Charts\\_in\\_Kenya.pdf](http://www.povertyactionlab.org/sites/default/files/publications/10_Kremer_Flip_Charts_in_Kenya.pdf)

Blattman, Chris. February 2008. *Evaluation 2.0*. Presentation to DFID.

Banerjee, Abhijit. "[Making Aid Work](#)." *The Boston Review*. July/August 2006.

Center for Global Development. "When will we ever learn? Improving Lives through Impact Evaluation." *Report of the Evaluation Gap Working Group*, Washington, D.C.: 2006. Pp. 9-33.

Ravallion, Martin. 2008. "Evaluating Anti-Poverty Programs", Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3831-3839

### II. Causal Inference and the Econometrics of Impact Evaluation

\*GMPRV, Chapter 3.

\*MHE, Chapters 1-2.

\*Ravallion, Martin. 2008. "Evaluating Anti-Poverty Programs", Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3788-3801.

\*Bernard, Tanguy and Maximo Torrero. March 2011. "Randomizing the "Last Mile": A Methodological Note on Using a Voucher-Based Approach to Assess the Impact of Infrastructure Projects." *IFPRI Discussion Paper 01078*. <http://www.ifpri.org/publication/randomizing-last-mile>.

The movie "Sliding Doors", 1998, with Gwyneth Paltrow, John Hannah, John Lynch and Jeanne Tripplehorn.

Winship, Christopher and Stephen L. Morgan 1999. "The Estimation of Causal Effects from Observational Data." *Annual Review of Sociology*. 25:659-706.

Shadish, William, Thomas D. Cook and Donald Campbell. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Chapter 1, pp. 1-18. Boston: Houghton-Mifflin.

### III. Randomized Evaluations I: The Econometrics of Randomized Evaluations

\*GMPRV, Chapter 4

\*KKH, Chapter 3

\*Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2008. "Using Randomization in Development Economics Research: A Toolkit", Chapter 61, *Handbook of Development Economics*. Sections 2.1, 2.2, 3.1., 5.1., 5.2. and 8.2.

\*MHE, Sections 3.2.1, 3.2.2 and 4.4.3.

\*Roodman, David. "[The Rapid Rise of Randomistas and the Trouble with RCTs.](#)" March 3, 2009. *David Roodman's Open Book Microfinance Blog*. Center for Global Development.

\*STATA Handout.

\*Ravallion, Martin. "Should you care about Impact Heterogeneity?" <http://blogs.worldbank.org/impactevaluations/should-you-care-about-impact-heterogeneity>

Ravallion, Martin. 2008. "Evaluating Anti-Poverty Programs", Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3801-3805.

Deaton, Angus. 2009. "[Instruments of development: Randomization in the tropics, and the search for the elusive keys to economic development.](#)" *NBER Working Paper #14690*.

Imbens, Guido. 2009. "[Better LATE Than Nothing: Some Comments on Deaton \(2009\) and Heckman and Urzua.](#)". Mimeo, Harvard University.

Rodrik, Dani. 2009. "The New Development Economics: We Shall Experiment, but how Shall we Learn?" in *What Works in Development, Thinking Big and Thinking Small*.

### IV. Randomized Evaluations II: Evaluations in Practice

\*Nelson, Jodi Lee. 2007. *Are we Ready for RCTs?* New York: International Rescue Committee.

\*Duflo, Esther, Pascaline Dupas, and Michael Kremer. 2012. "School Governance, Teacher Incentives and Pupil-Teacher Ratios: Experimental Evidence from Kenyan Primary Schools. Revised June 2012. NBER Working Paper #17939.

\*Bold, Tessa, Mwangi Kimenyi, Germano Mwabu, Alice Ng'ang'a and Justin Sandefur. "Interventions & Institutions Experimental Evidence on Scaling up Education Reforms in Kenya." CGD Working Paper.

\*Aker, Jenny C, Christopher Ksoll and Travis J. Lybbert. Forthcoming. "Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger." *American Economic Journal: Applied Economics*.

Dupas, Pascaline. 2011. [“Do Teenagers Respond to HIV Risk Information? Evidence from a Field Experiment in Kenya.”](#) *American Economic Journal: Applied Economics*. 3(1): 1-34.

Bruhn, Miriam and David McKenzie. October 2009. “In Pursuit of Balance: Randomization in Practice in Development Field Experiments.” *American Economic Journal-Applied Economics*. 1(4): 200-232.

## V. **Regression Discontinuity Design (RDD)**

\*GMPRV, Chapter 5

\*KKH, Chapter 7 (pp. 103-109)

\*MHE, Section 6.1.

\*Ravallion, Martin. 2008. “Evaluating Anti-Poverty Programs”, [Chapter 59](#), in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3812-3815.

\*Manacorda, Marco, Edward Miguel and Andrea Vigorito. 2011. “Government Transfers and Political Support.” *American Economic Journal: Applied Economics*.

\*Alix-Garcia, Jennifer, Craig McIntosh, Katharine Sims, and Jerrod Welch. Forthcoming. [“The Ecological Footprint of Poverty Alleviation : Evidence from Mexico’s Oportunidades program.”](#) *Review of Economics and Statistics*.

Lee, D. S. and T. Lemieux (2010). "Regression Discontinuity Designs in Economics." *Journal of Economic Literature* 48(2): 281-355.

Imbens, Guido and Thomas Lemieux. 2008. “Regression discontinuity designs: A guide to practice.” *Journal of Econometrics*. 142: 615–635.

Angrist, Joshua and Victor Lavy. 1999. “Using Maimonides Rule to Estimate the Effect of Class Size on Scholastic Achievement.” *The Quarterly Journal of Economics*, 114(2): pp. 533-575.

## VI. **Differences-in-Differences**

\*GMPRV, Chapter 6

\*KKH, Chapter 5.

\*Ravallion, Martin. 2008. “Evaluating Anti-Poverty Programs”, [Chapter 59](#), in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3815-3823.

\*Aker, Jenny. 2010. July 2010. “Information from Markets Near and Far: The Impact of Mobile Phones on Grain Markets in Niger.” *American Economic Journal: Applied Economics*. 2(July 2010): 46-59.

\*Duflo, Esther. "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment," *American Economic Review* 91(4): 795-813, 2001.

de Janvry, Alain, Craig McIntosh, and Elisabeth Sadoulet, "The Supply and Demand Side Impacts of Credit Market Information", forthcoming in *Journal of Development Economics*

Bleakley, Hoyt. April 2010. [Malaria Eradication in the Americas: A Retrospective Analysis of Childhood Exposure](#). *American Economic Journal: Applied Economics*. 2(2): 1-45.

Galiani, Sebastian, Paul Gertler, and Ernesto Schargrodski. 2005. "Water for Life: The Impact of the Privatization of Water Services on Child Mortality." *Journal of Political Economy*. 113(1).

## VII. Matching and Propensity Score

\*GMPRV, Chapter 7

\*KKH, Chapter 4.

\*MHE, Sections 3.3.1., 3.3.2 and 3.3.3.

\*Ravallion, Martin. 2008. "Evaluating Anti-Poverty Programs", Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3805-3812.

\*Caliendo, Marco and Sabine Kopeinig. 2005. "Some Practical Guidance for the Implementation of Propensity Score Matching." *IZA Discussion Paper No. 1588*. (Please read pp 1-16).

\*Bernard, Tanguy, Alemayehu Seyoum Taffesseb, Eleni Gabre-Madhin. 2008. "Impact of cooperatives on smallholders' commercialization behavior: evidence from Ethiopia." *Agricultural Economics* 39(2): 147-161.

\*Gotland, E. M., Sadoulet, E., De Janvry, A., Murgai, R., Ortiz, O., 2004. "The impact of farmer field schools on knowledge and productivity: A study of potato farmers in the Peruvian Andes." *Economic Development and Cultural Change* 53: 63-92.

Jalan, Jyotsna and Martin Ravallion. [Does Piped Water Reduce Diarrhea for Children in Rural India?](#) *Journal of Econometrics*. January 2003, 153-173.

Van de Walle, Dominique and Ren Mu. 2007. "Fungibility and the Flypaper Effect of Project Aid: Microevidence for Vietnam." *Journal of Development Economics*. 84: 667-685.

## VIII. Instrumental Variables

\*KKH, Chapter 6.

\*MHE Sections 4.1., 4.4.1.-4.4.2.



\*Ravallion, Martin. 2008. “Evaluating Anti-Poverty Programs”, Chapter 59, in T. Paul Schultz and John Strauss, ed *Handbook of Development Economics*, vol.4. pp. 3823-3831.

\*Duflo, E. (2003). “Grandmothers and granddaughters: Old age pension and intrahousehold allocation in South Africa”. *World Bank Economic Review* 17 (1), 1–26.

Ravallion, M., Wodon, Q. (2000). “Does child labor displace schooling? Evidence on behavioral responses to an enrollment subsidy”. *Economic Journal* 110, C158–C176.

Duflo, E., Pande, R. (2007). “Dams”. *Quarterly Journal of Economics* 122 (2), 601–646.

Werker, Eric D., Faisal Z. Ahmed and Charles Cohen. “How is Foreign Aid Spent? Evidence from a Natural Experiment.” *American Economic Journal: Macroeconomics* 1, No. 2 (July 2009): 225-244.

## **IX. Cost Benefit Calculations**

\*Dhaliwal, Iqbal, Esther Duflo, Rachel Glennerster, Caitlin Tulloch. August 2011. “Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education.” Abdul Jameel Poverty Action Lab.

\*Evans, David K. and Ghosh, Arkadipta. June 2008. *Prioritizing Educational Investments in Children in the Developing World*. WR-587. Rand Corporation: Santa Monica, CA.

\*J-PAL March 30, 2010. J-PAL Cost Effectiveness Methodology. Cambridge, MA: MIT.

## **X. Data Quality and Attrition and Power Calculations**

\*Baird, Sarah, Joan Hamory, and Edward Miguel. [Tracking, Attrition and Data Quality in the Kenya Life Panel Survey Round 1](#).

\*Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2008. “Using Randomization in Development Economics Research: A Toolkit”, Chapter 61, *Handbook of Development Economics*. Section 4.

Zwane, Alix et al. “The Risk of Asking : Being Surveyed can Affect Later Behavior.”

## **XI. Power Calculations**

\*Duflo, Esther, Rachel Glennerster, and Michael Kremer. 2008. “Using Randomization in Development Economics Research: A Toolkit”, Chapter 61, *Handbook of Development Economics*. Section 4.

Bloom, Howard S. 2006. “The Core Analytics of Randomized Experiments for Social Research.” MRDC Working Papers on Social Science Research Methodology.

## **XII. Reporting Impact Evaluation Results**

## A Guide to Critically Reading Impact Evaluations

As you read the articles assigned for this course, please keep the following questions in mind:

### *Main Research Questions*

1. What is the main research question being asked in this paper? Do you think that this question is interesting from both a development and policy perspective?
2. What is the main causal question being asked in the paper? (This should be of the form: “What is the effect of  $X$  on  $Y$ ?” Make sure that you can identify the  $X$  and  $Y$ )
3. What are the other variables ( $Z$ ) that can affect  $Y$ ? Which of these are observable? Which are unobservable?

### *Study Design and Identification Strategy*

4. How do the authors identify the causal effect of  $X$  on  $Y$ ? (Note: Clearly state how the counterfactual is constructed. This should refer to the “treatment group” and “control group”)
5. Who is the treatment group? Who is the control group?
6. If the study used randomization to construct a counterfactual, answer the following questions:
  - What units did the program randomize across?
  - Are there any potential concerns with this randomization approach?
  - Did the randomization “work”? How do you know?

### *Findings, Internal and External Validity*

7. What are the key findings of the paper? Are these effects economically and statistically important?
8. What are the main threats to internal validity of the findings? (Are the falsification tests and robustness checks convincing?)
9. What are the limits to external validity?
10. Would you recommend that this program be expanded to other areas or countries? Why or why not?
11. Is this the best way to answer the causal question of interest? Is there a better methodology, sample or context?