

# Técnicas Econométricas para Avaliação de Impacto

## Programa do Curso

### 1 - Análise de Causalidade e o Problema da Avaliação de Impacto

Dia 09/04/2008

**Instrutor:** Rafael Perez Ribas

#### **Bibliografia básica:**

Heckman, J. J. (2008). 'Econometric Causality,' Cemmap Working Paper 1/08, IFS, London.

Dowd, B. and R. Town (2002). 'Does X really cause Y?' Academy Health, Robert Wood Johnson Foundation, HCFO program, Washington D.C. 24p.

#### **Bibliografia complementar:**

Moffit, R. (2005). 'Remarks on the Analysis of Causal Relationships in Population Research,' *Demography* 42 (1): 91-108.

Heckman, J. J. and E. J. Vytlacil (2007). 'Econometric Evaluation of Social Programs, Part I: Causal Models, Structural Models and Econometric Policy Evaluation,' *Handbook of Econometrics*, v. 6B, pp. 4779-4874.

Heckman, J. J. (2000). 'Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective,' *Quarterly Journal of Economics* 115 (1): 45-97.

Rubin, D. B. (1974). 'Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies,' *Journal of Educational Psychology* 66 (5), 688-701.

Holland, P. W. (1986). 'Statistics and Causal Inference: Comment: Which Ifs Have Causal Answers,' *Journal of the American Statistical Association* 81 (396): 961-962.

Rubin, D. B. (1986). 'Statistics and Causal Inference,' *Journal of the American Statistical Association* 81 (396): 945-960.

Cox, D. R. (1986). 'Statistics and Causal Inference: Comment,' *Journal of the American Statistical Association* 81 (396): 963-964.

Glymour, C. (1986). 'Statistics and Causal Inference: Comment: Statistics and Metaphysics,' *Journal of the American Statistical Association* 81 (396): 964-966.

Granger, C. (1986). 'Statistics and Causal Inference: Comment,' *Journal of the American Statistical Association* 81 (396): 967-968.

Holland, P. W. (1986). 'Statistics and Causal Inference: Rejoinder,' *Journal of the American Statistical Association* 81 (396): 968-970.

Cox, D. R. (1992). 'Causality: Some Statistical Aspects,' *Journal of the Royal Statistical Society, Series A*, v. 155 (2): 291-301.

- **Exercícios Práticos no Computador**

- Apresentação dos recursos do Stata;
- Interface do Stata for Windows;
- Utilizando o Stata interativamente;

- Gravando saídas em um arquivo log;
- A utilização de do files;
- Comandos básicos;
- Apresentação das bases de dados utilizadas no curso;
- Exercício com a descrição do que há nas bases de dados.

## **2 - Avaliação Utilizando Experimentos**

Dia 16/04/2008

**Instrutor:** Fábio Veras Soares

### **Bibliografia básica:**

Duflo, E., R. Glennerster, M. Kremer (2008). 'Using Randomization in Development Economics Research: A Toolkit,' *Handbook of Development Economics*, v. 4, forthcoming.

### **Bibliografia complementar:**

LaLonde, R. J. (1986). 'Evaluating the Econometric Evaluations of Training Programs with Experimental Data,' *American Economic Review* 76 (4): 604-620.

Heckman, J. J. (1996). 'Randomization as an Instrumental Variable,' *Review of Economics and Statistics* 78 (2): 336-341.

Heckman, J. J., J. Smith, N. Clements (1997). 'Making the Most Out of Programme Evaluations and Social Experiments: Accounting for Heterogeneity in Programme Impacts,' *Review of Economic Studies* 64 (4): 487-535.

Behrman, J. and Hoddinott, J. (2001). 'Programme Evaluation with Unobserved Heterogeneity and Selective Implementation: The Mexican 'PROGRESA' Impact on Child Nutrition,' *Oxford Bulletin of Economics and Statistics* 67 (4): 547-569.

Moffit, R. A. (2004). 'The Role of Randomized Field Trials in Social Science Research,' *American Behavioral Scientist* 47 (5): 506-540.

Splawa-Neyman, J. (1923). 'On the Application of Probability Theory to Agricultural Experiments. Essays on Principles. Section 9,' *Annals of Agriculture Science*, pp. 1-51, translated and edited by D. M. Dabrowska and T. P. Speed from the Polish original, *Statistical Science* 5 (4): 465-472, 1990.

- **Exercícios Práticos no Computador**

- Análise descritiva das bases de dados;
- Testes de igualdade das médias e das distribuições.

## **3 - Introdução aos Métodos Quase-Experimentais**

Dia 23/04/2008

**Instrutor:** Rafael Perez Ribas

### **Bibliografia básica:**

Blundell, R. and M. C. Dias (2000). 'Evaluation Methods for Non-Experimental Data,' *Fiscal Studies* 21 (4): 427-468.

Ravallion, M. (2001). 'The Mystery of the Vanishing Benefit: An Introduction to Impact Evaluation,' *World Bank Economic Review* 15 (1): 115-140.

Heckman, J. J. (1990). 'Varieties of Selection Bias,' *American Economic Review* 80 (2): 313-318.

### **Bibliografia complementar:**

Rubin, D. B. (1977). 'Assignment to Treatment Group on the Basis of a Covariate,' *Journal of Educational Statistics* 2 (1): 1-26.

Heckman, J. J., R. Robb Jr. (1985). 'Alternative Methods for Evaluating the Impact of Interventions: An Overview,' *Journal of Econometrics* 30 (1-2): 239-267.

Angrist, J. D. and A. B. Krueger (1999). 'Empirical Strategies in Labor Economics,' *Handbook of Labor Economics*, v. 3, chap. 23, pp. 1277-1366.

Heckman, J. J., H. Ichimura, J. Smith, P. Todd (1998). 'Characterizing Selection Bias Using Experimental Data,' *Econometrica* 66 (5): 1017-1098.

- **Exercícios Práticos no Computador**

- Análise de impacto com regressão linear;
- Análise de impacto com regressão não-linear (probit, logit, etc.);
- Estimando heterogeneidade do impacto.

## **4 - Método de Diferença em Diferenças**

Dia 30/04/2008

**Instrutor:** Bruno César Pino de Oliveira Araújo

### **Bibliografia básica:**

Meyer, B. D. (1994). 'Natural and Quasi-Experiments in Economics,' Technical Working Paper 170, NBER, Cambridge MA. Published in *Journal of Business & Economic Statistics* 13 (2): 151-161.

### **Bibliografia complementar:**

Ashenfelter, O. and D. Card (1985). 'Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs,' *Review of Economics and Statistics* 67 (4): 648-660.

Athey, S. and G. Imbens (2006). 'Identification and Inference in Nonlinear Difference-in-Differences Models,' Technical Working Paper 280, NBER, Cambridge MA. Published in *Econometrica* 74 (2): 431-497.

Bertrand, M., E. Duflo, S. Mullainathan (2002). 'How Much Should We Trust Differences-in-Differences Estimates?' Working Paper 8841, NBER, Cambridge MA. Published in *Quarterly Journal of Economics* 119 (1): 249-275.

- **Exercícios Práticos no Computador**

- Estimação do modelo com diferenças;
- Estimação do modelo com diferenças e efeitos fixos;
- Estimação do modelo de diferença-nas-diferenças *cross-section*;
- Estimando heterogeneidade do impacto no modelo de diferença-nas-diferenças.

## 5 - Matching

Dia 07/05/2008

**Instrutor:** Bruno César Pino de Oliveira Araújo

### **Bibliografia básica:**

Abadie, A., D. Drukker, J. L. Herr, G. W. Imbens (2004). 'Implementing Matching Estimators for Average Treatment Effects in Stata,' *Stata Journal* 4 (3): 290-311.

### **Bibliografia complementar:**

Heckman, J. J., H. Ichimura, P. Todd (1997). 'Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Program,' *Review of Economic Studies* 64(4): 605-654.

Abadie, A. and G. Imbens (2002). 'Simple and Bias-Corrected Matching Estimators for Average Treatment Effects,' Technical Working Paper 283, NBER, Cambridge MA.

Rubin, D. B. (1973). 'Matching to Remove Bias in Observational Studies,' *Biometrics* 29 (1): 159-183.

Rubin, D. B. (1979). 'Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies,' *Journal of American Statistical Association* 74 (366): 318-328.

Quade, D. (1982). 'Nonparametric Analysis of Covariance by Matching,' *Biometrics* 38 (3): 597-611.

Ñopo, H. (2002). 'Matching as a Tool to Decompose Wage Gaps,' IZA Discussion Paper 981, IZA, Bonn, Germany.

- **Exercícios Práticos no Computador**

- Exercícios de Matching utilizando o 'nnmatch';
- Exercícios de Matching com diferença-nas-diferenças;
- Alguns testes de robustez.

## 6 - Escore de Propensão e o Método PSM

Dia 14/05/2008

**Instrutor:** Bruno César Pino de Oliveira Araújo

### **Bibliografia básica:**

Becker, S. O. and A. Ichino (2002). 'Estimation of average treatment effects based on propensity score,' *Stata Journal* 2 (4): 358-377.

### **Bibliografia complementar:**

Rosenbaum, P. R. and D. B. Rubin (1983). 'The Central Role of the Propensity Score in Observational Studies for Causal Effects,' *Biometrika* 70 (1): 41-55.

Rosenbaum, P. R. and D. B. Rubin (1984). 'Reducing Bias in Observational Studies Using Subclassification on the Propensity Score,' *Journal of the American Statistical Association* 79 (387): 516-524.

Rosenbaum, P. R. and D. B. Rubin (1985). 'Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score,' *American Statistician* 39 (1): 33-38.

Dehejia, R. H. and S. Wahba (2002). 'Propensity Score-Matching Methods for Nonexperimental Causal Studies,' *Review of Economics and Statistics* 84 (1): 151-161.

Smith, J. and P. Todd (2003). 'Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators?' Working Paper 20035, CIBC Human Capital and Productivity Project, University of Western Ontario. Published in *Journal of Econometrics* 125 (1-2): 305-353, 2005.

Dehejia, R. H. (2005). 'Practical propensity score matching: a reply to Smith and Todd,' *Journal of Econometrics* 125 (1-2): 355-364.

Smith, J. and P. Todd (2005). 'Rejoinder,' *Journal of Econometrics* 125 (1-2): 365-375.

Dehejia, R. H. (2005). 'Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators? A Postscript,' unpublished.

Lee, W. S. (2006). 'Propensity Score Matching and Variations on the Balancing Test,' Melbourne Institute of Applied Economic and Social Research, University of Melbourne, Australia.

Blundell, R. and M. C. Dias (2000). 'Evaluation Methods for Non-Experimental Data,' *Fiscal Studies* 21 (4): 427-468.

- **Exercícios Práticos no Computador**

- Estimaco do Escore de Propenso;
- Testes da Propriedade de Balano;
- Anlise Grfica do Escore de Propenso;
- Estimaco do PSM com diferentes tcnicas.

## **7 - Outras Tcnicas que Utilizam o Escore de Propenso**

Dia 21/05/2008

**Instrutor:** Rafael Perez Ribas

### **Bibliografia bsica:**

Hirano, K. and G. W. Imbens (2001). 'Estimation of Causal Effects using Propensity Score Weighting: An Application to Data on Right Heart Catheterization,' *Health Service & Outcomes Research Methodology* 2 (3-4): 259-278.

### **Bibliografia complementar:**

Hirano, K., G. W. Imbens, G. Ridder (2003). 'Efficient Estimation of Average Treatment Effects Using the Estimated Propensity Score,' *Econometrica* 71 (4): 1161-1189.

Abadie, A. (2005). 'Semiparametric Difference-in-Differences Estimators,' *Review of Economic Studies* 72 (250): 1-19.

Wooldridge, J. M. (2002). 'Inverse Probability Weighted M-Estimators for Sample Selection, Attrition, and Stratification,' *Portuguese Economic Journal* 1 (2): 117-139.

Wooldridge, J. M. (2004). 'Inverse Probability Weighted Estimation for General Missing Data Problems,' CeMMAP Working Paper 05/04, IFS, London. Published in *Journal of Econometrics* 141 (2): 1281-1301, 2007.

Lemieux, T. (2002). 'Decomposing Changes in Wage Distributions: A Unified Approach,' *Canadian Journal of Economics* 35 (4): 646-688.

Firpo, S. (2004). 'Efficient Semiparametric Estimation of Quantile Treatment Effects,' *Econometric Society 2004 North American Summer Meetings* 605, Econometric Society. Published in *Econometrica* 75 (1): 259-276, 2007.

- **Exercícios Práticos no Computador**

- Estimaco do indicador semi-paramtrico cross-section;
- Estimaco do indicador semi-paramtrico de diferena-nas-diferenas;
- Estimaco da regresso ponderada pelo escore de propenso;
- Estimaco dos efeitos para subgrupos da amostra.

## **8 - Variveis Instrumentais**

Dia 28/05/2008

**Instrutor:** Guilherme Issamu Hirata

### **Bibliografia bsica:**

Heckman, J. J. (1997). 'Instrumental Variables: A Study of Implicit Behavioral Assumptions Used in Making Program Evaluations,' *Journal of Human Resources* 32 (3): 441-462.

Altonji, J. G., T. E. Elder, C. R. Taber (2002). 'An Evaluation of Instrumental Variable Strategies for Estimating the Effects of Catholic Schooling,' Working Paper 9358, NBER, Cambridge MA. Published in *Journal of Human Resources* 40 (4): 791-821, 2005.

### **Bibliografia complementar:**

Heckman, J. J. (1996). 'Randomization as an Instrumental Variable,' *Review of Economics and Statistics* 78 (2): 336-341.

Angrist, J., G. W. Imbens, D. B. Rubin (1993). 'Identification of Causal Effects Using Instrumental Variables,' Technical Paper 136, NBER, Cambridge MA. Published in *Journal of the American Statistical Association* 91 (434): 444-455, 1996.

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* 15 (4): 69-85.

Angrist, J. D. and G. W. Imbens (1999). 'Comment on James J. Heckman, "Instrumental Variables: A Study of Implicit Behavioral Assumptions Used in Making Program Evaluations"', *Journal of Human Resources* 34 (4): 823-827.

Angrist, J. D. and G. Imbens (1995). 'Two-Stage Least Square Estimation of Average Causal Effects in Models with Variable Treatment Intensity,' *Journal of the American Statistical Association* 90 (430): 431-442.

Imbens, G. W. and D. B. Rubin (1997). 'Bayesian Inference for Causal Effects in Randomized Experiments with Noncompliance,' *Annals of Statistics* 25 (1): 305-327.

Imbens, G. W. and J. D. Angrist (1994). 'Identification and Estimation of Local Average Treatment Effects,' *Econometrica* 62 (2): 467-475.

Ichimura, H. and C. Taber (2001). 'Propensity-Score Matching with Instrumental Variables,' *American Economic Review* 91 (2): 119-124.

- **Exercícios Práticos no Computador**

- Estimaco de IV com varivel endgena contnua;
- Estimaco de IV com dummy endgena;
- Estimaco em dois estgios e correo da varincia;
- Estimaco do endogenous switching model (treatreg);
- Estimaco do PSM com IV.

## **9 - Regresso Descontnua**

Dia 04/06/2008

**Instrutor:** Guilherme Issamu Hirata

### **Bibliografia bsica:**

Imbens, G. W. and T. Lemieux (2007). 'Regression Discontinuity Designs: Guide to Practice,' Working Paper 13039, NBER, Cambridge MA. Published in *Journal of Econometrics* 127 (2): 615-635.

Van der Klaauw, W. (2002). 'Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression-Discontinuity Approach', *International Economic Review* 43(4): 1249-1287.

### **Bibliografia complementar:**

Hahn, J., P. Todd, W. Van der Klaauw (2001). 'Identification and estimation of treatment effect with a regression-discontinuity design,' *Econometrica* 69 (1): 201-209.

Lee, D. S. and D. Card (2006). 'Regression Discontinuity Inference with Specification Error,' Technical Working Paper 322, NBER, Cambridge MA. Published in *Journal of Econometrics* 127 (2): 655-674.

DiNardo, J. and D. S. Lee (2004). 'Economic impacts of unionization on private sector employers: 1984-2001', Working Paper 10598, NBER, Cambridge MA.

Buddelmeyer, H. and E. Skoufias (2003). 'An Evaluation of the Performance of Regression Discontinuity Design on PROGRESA,' IZA Discussion Paper 827, IZA, Bonn, Germany.

Almond, D. and J. J. Doyle Jr. (2008). 'After Midnight: A Regression Discontinuity Design in Length of Postpartum Hospital Stays,' Working Paper 13877, NBER, Cambridge MA.

- **Exerccios Prticos no Computador**

- Estimaco linear de RDD;
- Estimaco no-paramtrica de RDD;
- Escolha do bandwidth timo;
- Estimaco dos RDDs Sharp e Fuzzy.

## **10 - Estimaco de Impacto de Mltiplos Tratamentos e Dosagem**

Dia 11/06/2008

**Instrutor:** Fbio Veras Soares

### **Bibliografia básica:**

Imai, K. and D. A. van Dyk (2003). 'Causal Inference with General Treatment Regimes: Generalizing the Propensity Score,' Published in *Journal of the American Statistical Association* 99 (467): 854-866, 2004.

Hirano, K. and G. W. Imbens (2004). 'The Propensity Score with Continuous Treatments,' Published in A. Gelman and X.-L. Meng, *Applied Bayesian Modeling and Causal Inference from Incomplete-Data Perspectives*, 2004.

### **Bibliografia complementar:**

Lechner, M. (1999). 'Identification and Estimation of Causal Effects of Multiple Treatments Under the Conditional Independence Assumption,' IZA Discussion Paper 91, IZA, Bonn, Germany.

Brand, J. E. and Y. Xie (2007). 'Identification and Estimation of Causal Effects with Time-Varying Treatments and Time-Varying Outcomes,' Published in *Sociological Methodology* 37 (1): 393-434, 2007.

Flores, C. A. (2005). *Estimation of Dose-Response Functions and Optimal Treatment Doses with a Continuous Treatment*, PhD Dissertation, University of California at Berkeley, 199p.

- **Exercícios Práticos no Computador**

- Estimação e aplicação do Escore de Propensão para múltiplos tratamentos;
- Estimação e aplicação do Escore de Propensão para tratamento contínuo;
- Testes de balanço.

## **11 - Problemas de Contaminação na Validação Interna**

Dia 25/06/2008

**Instrutor:** Fábio Veras Soares e Rafael Perez Ribas

### **Bibliografia básica:**

Heckman, J. J., N. Hohmann, J. Smith, M. Khoo (2000). 'Substitution and Dropout Bias in Social Experiments: A Study of an Influential Social Experiment,' *Quarterly Journal of Economics* 115 (2): 651-694.

Miguel, E. and M. Kremer (2004). 'Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities,' *Econometrica* 72 (1): 159-217.

### **Bibliografia complementar:**

Barrera-Osorio, F., M. Bertrand, L. L. Linden, F. Perez-Calle (2008). 'Conditional Cash Transfers in Education: Design Features, Peer and Sibling Effects: Evidence from Randomized Experiment in Colombia,' Working Paper 13890, NBER, Cambridge MA.

Heckman, J. J. (1991). 'Randomization and Social Policy Evaluation,' Technical Working Paper 107, NBER, Cambridge MA. Published in C. F. Manski and I. Garfinkel, *Evaluating Welfare and Training Programs*, Harvard University Press, Massachusetts, 1992.

- **Exercícios Práticos no Computador**

- Revisão das práticas anteriores.



## **12 - Problemas de Validação Externa (Scaling Up)**

Dia 02/07/2008

**Instrutor:** Fábio Veras Soares e Rafael Perez Ribas

### **Bibliografia básica:**

Duflo, E. (2003). 'Scaling Up and Evaluation,' ABCDE Annual World Bank Conference on Development Economics, Bangalore, May.

### **Bibliografia complementar:**

Heckman, J. J., L. Lochner, C. Taber (1998). 'General-Equilibrium Treatment Effects: A Study of Tuition Policy,' *American Economic Review* 88 (2): 381-386.

- **Exercícios Práticos no Computador**
  - Revisão das práticas anteriores.

### **Bibliografia de apoio:**

Cameron, A. C. and P. K. Trivedi (2005). *Microeconometrics: Methods and Application*, Cambridge University Press, New York.

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge MA.

Heckman, J. J. (1999). 'The Economics and Econometrics of Active Labor Market Programs,' *Handbook of Labor Economics*, v. 3, chap. 31, pp. 1865-2097.

Baker, J. L. (2000). *Evaluating the Impact of Development Projects on Poverty: A Handbook for Practitioners*, World Bank, Washington D.C., 225p.

### **Bibliografia para outros temas não abordados no curso:**

Hotz, V. J., C. H. Mullin, S. G. Sanders (1997). 'Bounding Causal Effects Using Data From a Contaminated Natural Experiment: Analysis the Effects of Teenage Childbearing,' *Review of Economic Studies* 64 (4): 575-603.

Manski, C. F. (1990). 'Nonparametric Bounds on Treatment Effects,' *American Economic Review* 80 (2): 319-323.

Bourguignon, F., F. H. G. Ferreira, P. G. Leite (2002). 'Ex-ante Evaluation of Conditional Cash Transfer Programs: The Case of Bolsa Escola,' William Davidson Working Paper 516, University of Michigan Business School.

ADB (2007). *Poverty Impact Analysis: Selected Tools and Applications*, Parts 1 and 2.

**Link com o material do curso:** <http://www.undp-povertycentre.org:8080/evaluation/>

**Link para curso do NBER (Imbens & Wooldridge):** <http://www.nber.org/minicourse3.html>