

FGV Sao Paulo School of Business Administration
14.349-30 Causal Inference in Strategy Research
(2015-II)

Instructor: Rodrigo Bandeira-de-Mello

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Time & Room

Classes: Mondays, 1-4pm
Room 1005

Office

Room 1105, Itapeva 474
Email: rodrigo.bandeira.demello@fgv.br

Overview and Course Goals

The major sources of data in strategy research comes from natural observations of sample units in their own settings. This is why empirical research in strategy has increasingly made use of sophisticated methods to overcome the major drawbacks of inferring causality from observational studies. This seminar covers the main designs and inference methods suitable for causal effect identification in observational studies. We draw from examples of applications in fields where these methods have been largely applied and discussed, such as economics and political science, in order to discuss their applications in strategy research. This seminar is an extension of the actual courses on quantitative methods in our graduate program. I address the topics of this course from the practical point of view, not from a purely statistical analysis. The statistical notation used here is sufficient to make the researcher more confident when discussing the "tricks of the trade" of method applications. The class is open to qualified students from other research streams other than strategy.

I expect that, by the end of this course, you will be able:

- to propose creative designs to identify causal effects for major problems in strategy research;
- to critically analyze the existing publications that aims at testing causality;
- to compute estimates for causal effects.

Prerequisites

These are the three prerequisites for this course:

- Research methods: proposing research questions, deriving hypotheses, identifying the basic research designs in quantitative research. These topics are covered in the course "Métodos de Pesquisa", mandatory for all grad students.
- Statistics: correlation, partial correlation, OLS regression, hypothesis testing, probability distributions. These topics are covered in the courses "Análise Multivariada de Dados" and "Metodos Quantitativos de Pesquisa".
- Computation: familiarity with any statistical software. We will use R in this course (more on this below).

In order to help you to decide whether this course or not, I prepared the following **self-assessment test**. Please assign the most probable answer you give to each one of the three questions and then sum up the final score.

Question 1) Look at the equation below and assign your answer:

$$\hat{y} = \alpha + \sum_{i=1}^n \beta_i x + \epsilon \quad (1)$$

(0 pt) "I have no idea how to read this and what it implies".

(1 pt) "I can read it, and I guess what it is, but I do not know how to write one by myself".

(2 pts) "I can read it, understand it, and know how to write a new equation like this".

Question 2) Look at the table below and assign your answer:

Table 2. Effects of resources and exchange conditions on interfirm cooperation

	Resources		Exchange Conditions	
Age	0.09	0.82	0.05	0.43
Size	-0.05	0.43	-0.43**	3.12
Growth	0.10	0.86	-0.07	0.67
Brand name	-0.25*	2.39		
TMT Experience	-0.01	0.12		
Slack Capital	-0.25*	2.10		
Asset Specificity			0.20*	2.06
Specific Knowledge			-0.23*	2.23
Geographic Dispersion			0.39**	2.85
df	(6,87)		(6,87)	
R ²	0.16		0.24	
F	2.83*		4.42***	

N = 94

*p<0.05

**p<0.01

***p<0.001

- (0 pt) "I have no idea how to read this and what it implies".
(1 pt) "I can interpret the main results".
(2 pts) "I can fully understand all tests performed in the table".

Question 3) Can I write a statistical software code to produce the table presented in Question 2?

- (0 pt) "I have never used any statistical software before".
(1 pt) "I can produce the table only by using the software menus, but I never wrote a code".
(2 pts) "I can write the code, run it, and present the output".

If your total score is **zero**, I am afraid this course is not for you this semester. If your total score is between **one and three**, you are qualified to take the course but keep in mind that you will need additional work on some prerequisites. If your total score is **greater or equal to four**, then this course is the right one for you.

Course Requirements

Presentations (30%): Course sessions for each topic rely on theory and examples of applications. One important part of this course is to discuss strengths and weakness of the decisions made by the authors of selected applications. During the course, you will provide your own evaluation for one or more papers using, at least, the content of this course. Please prepare a presentation on the following topics: a) question and motivation; b) contribution; c) hypotheses (in a graphical representation, if possible); d) design and estimation methods; e) your personal assessment. One slide per topic is sufficient. Item e) is the most important item for grading purposes.

Problem sets (30%): These monthly assignments include interpretation and computation exercises about the topics covered in the period. They will be graded according to a three-point scale: $\sqrt{-}$, $\sqrt{}$, and $\sqrt{+}$. I encourage you to work together with your classmates, but you have to write your own answer. Please, if it is the case, write the names of your co-workers on your assignment. Each problem set will count equally toward the calculation of the final grade. You will have around 15 days to finish each set. I expect that you bring your typed, commented, and well-organized answers to class on the due date. I will not accept late or email submissions.

Project (40%): The final project will be a short research paper which typically applies a method we learned in this course to an empirical problem of your substantive interest. You are free to chose any topic you want as long as there is a clear research question that addresses causality in strategy research. Projects co-authored with another student is strongly encouraged. A replication paper is accepted as long as it goes beyond the original analysis by applying one of the methods learned in the course. I suggest that you follow the SMJ Research Notes section for examples and style guidelines. Please submit a copy of your analysis code too. The project milestones and deadline are listed in the course sessions and schedule section.

Computation

I will teach the course using R software. You can download it for free here. This is an open-source software with great tutorials and resources available online. Just google it. You might want to use R with the integrated development environment RStudio. You can also download it for free here. A good suggestion are the tutorials provided by Dan Goldstein (tutorial 1 and tutorial 2) and DataCamp.

If you are familiar with other statistical software you may use it for the course at your own risk. I can only give support for R.

Books

We will read chapters from these books:

Angrist JD, Pischke JS. 2014. *Mastering 'Metrics: The Path from Cause to Effect*. Princeton University Press

Angrist JD, Pischke JS. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press

Morgan SL, Winship C. 2014. *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Cambridge University Press. 2nd. ed. edition

Course Sessions and Schedule

Session (03/08): Introduction to Causality

- Overview, course requirements, course outline
- The selection problem
- The potential outcome model
- Causality as counterfactuals

Readings

- Morgan and Winship (2014, chapters 1, 2, and 3)

Session (10/08): Randomized experiments I

- Identification of causal effects under randomization

- Natural and field Experiments

Readings

- Angrist and Pischke (2008, chapters 1 and 2)
- Angrist and Pischke (2014, chapter 1)

Readings: applications

- To be defined

Session (17/08): Randomized experiments II

- Practical considerations

Readings

- Angrist and Pischke (2014, chapter 1)
- Natural experiment: Ferraz and Finan (2008) and Harrison and List (2004)
- Field experiment: Olken (2007)
- Levitt and List (2006)
- Gaines, Kuklinski, and Quirk (2007)
- Duflo, Glennerster, and Kremer (2006)

Readings: applications

- To be defined

Session (24/08): Regression

- OLS as estimator of causal effects
- Practical considerations

Readings

- Angrist and Pischke (2008, chapter 3)
- Angrist and Pischke (2014, chapter 2)
- Hamilton and Nickerson (2003, chapter 2)

Readings: applications

- To be defined

Session (31/08): Instrumental Variables I

Turn in Problem Set 1

- Local average treatment effects (LATE)
- Two-stage least squares
- Treatment non-compliance

Readings

- Angrist and Pischke (2008, chapter 4)
- Angrist and Pischke (2014, chapter 3)
- Morgan and Winship (2014, chapter 9)
- Angrist, Imbens, and Rubin (1996)

Readings: applications

- To be defined

Session (14/09): to be defined

EnAnpad

Session (21/09): Instrumental Variables II

- Searching for a good instrument in strategy research

Readings

- Acemoglu, Johnson, and Robinson (2000)
- Angrist, Imbens, and Rubin (1996)
- Angrist (1990)

Readings: applications

- To be defined

Session (28/09): Mid-term project presentation

- Selected students will present their projects. Please be prepared for a 10-minute presentation-discussion showing: research question, motivation, empirical strategy, and data collection.

Session (05/10): Matching I

Turn in Problem Set 2

- Selection on observables
- The propensity score

Readings

- Morgan and Winship (2014, chapter 5)

Readings: applications

- To be defined

Session (19/10): Matching II

- Practical considerations for PSM in strategy research

Readings

- Sekhon and Titiunik (2012)
- Rubin (2001)
- Caliendo and Kopenig (2005)
- Imbens (2014)

Readings: applications

- To be defined

Session (26/10): Fixed Effects and Differences-in-Differences I

- Selection on time-invariant unobservables

- Practical considerations

Readings

- Angrist and Pischke (2008, chapter 5)
- Angrist and Pischke (2014, chapter 5)

Readings: applications

- To be defined

Session (09/11): Fixed Effects and Differences-in-Differences II

- Practical considerations for research in strategy

Readings

- Bertrand, Duflo, and Mullainathan (2004)
- La Ferrara, Chong, and Duryea (2012)
- Ladd and Lenz (2009)

Readings: applications

- To be defined

Session (16/11): Regression-Discontinuity Design

Turn in Problem Set 3

- Identification
- Sharp and Fuzzy designs
- Estimation
- Practical considerations

Readings

- Angrist and Pischke (2008, chapter 6)
- Angrist and Pischke (2014, chapter 4)
- Boas, Hidalgo, and Richardson (2014)
- Imbens and Lemieux (2008)
- Hahn, Todd, and Klaauw (2001)

Readings: applications

- To be defined

Sessions (23/11 e 30/11): Final project presentation

- All students will turn in their final projects on this date.
- Selected students will present the results of their projects. Please be prepared for a 20-minute presentation + discussion showing: research question, motivation, empirical strategy, and results.

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