

Inferência Causal

(orig: Econometria do Setor Público)

2º semestre de 2022

Sextas-feiras de 08:00 a 12:00

Professor: Rafael Terra

Atendimento: Segundas-feiras das 10:00 as 12:00 (favor marcar com antecedência).

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Material: Teams e Youtube

1 Objetivos do Curso

O curso de Econometria do Setor Público busca ensinar os métodos quantitativos de inferência causal. O curso tem um enfoque prático, com uso intensivo do pacote R.

2 Conteúdo

1. Módulo de Revisão de Econometria

(a) Regressão Linear

- i. Estimador MQO, Variância do Estimador, Variância Robusta, Endogeneidade.

(b) Painel

- i. Mínimos Quadrados Empilhados, Efeitos Fixos, Primeiras Diferenças, Efeitos Aleatórios, Teste de Hausman.

(c) Variáveis Instrumentais

- i. Estimador de Variáveis Instrumentais, Mínimos Quadrados em Dois Estágios, Estimador de Wald.

2. Módulo de Avaliação

(a) Modelo estrutural de Roy/Heckman/Borjas: Seleção amostral

- i. Descrição da intuição do modelo de Roy e a derivação do modelo econométrico estrutural de Borjas (usando a estratégia desenvolvida por Heckman).

(b) Seminário de alunos - grupo 1: Directed Acyclic Graphs (DAGs) para definir Structural Causal Models

(c) Métodos experimentais/Experimentos randomizados

- i. Tamanho da amostra, tamanho do efeito e poder do teste.
- ii. Desenho de avaliação.

- (d) Métodos quase-experimentais: seleção em observáveis
 - i. Matching e o uso dos propensity scores e regressão com covariadas
 - ii. Seminário de alunos - grupo 2: Inverse Probability Weighting (IPW)
 - iii. Controle sintético
- (e) Métodos quase-experimentais: seleção em não-observáveis (Experimentos Naturais)
 - i. Método de diferenças em diferenças e suas extensões
 - ii. Seminário de alunos - grupo 3: Event Studies e Staggered Differences in Differences.
 - iii. Local Average Treatment Effect
 - iv. Regressão com descontinuidade (RDD).
 - v. Seminário de alunos - grupo 4: Robust RDD (Cattaneo et al).
 - vi. O efeito do tratamento nos quantis. IVQTE
 - vii. Seminário de alunos - grupo 5: Machine Learning and Causality (Athey et al.)

3 Cronograma Aulas

O Cronograma inicial encontra-se na tabela 1.

Tabela 1: Tópicos de aulas

Tópicos	Sequência
Estimador MQO, Variância do Estimador, Variância Robusta, Endogeneidade.	04/11
Mínimos Quadrados Empilhados, Efeitos Fixos, Primeiras Diferenças, Efeitos Aleatórios.	04/11
Prática com R	11/11
Estimador de Variáveis Instrumentais, Mínimos Quadrados em Dois Estágios, Estimador de Wald.	18/11
Modelo de Roy/Borjas	18/11
Seminário grupo 1 e prática com R	25/11
Experimentos randomizados.	02/12
Tamanho da amostra, tamanho do efeito e poder do teste.	02/12
Prática com R	09/12
Matching e o uso dos propensity scores e regressão com covariadas	16/12
Controle sintético	16/12
Seminário grupo 2 e Prática com R	06/01
Método de diferenças em diferenças e suas extensões	13/01
Local Average Treatment Effect	13/01
Seminário Grupo 3 e Prática com R	20/01
Regressão com descontinuidade (RDD).	Aula 27/01
O efeito do tratamento nos quantis. IVQTE	Aula 27/01
Seminário Grupos 4 e 5 e Prática com R	03/02
Entrega da prova	10/02

4 Requisitos

Os requisitos para acompanhamento ótimo do curso são:

1. Cálculo Básico (funções de várias variáveis, limite e derivada parcial).
2. Álgebra linear Básica (Operações básicas com matrizes, matriz transposta, matriz quadrada, Identidade, matriz inversa, determinantes).
3. Estatística Básica. Operadores Esperança, Variância e plim. Teorema do Limite Central, LGN, Consistência e Eficiência dos estimadores, Inferência Estatística.
4. Regressão Simples e Múltipla (com notação matricial).
5. Ter **acesso ao software estatístico R**.

5 Avaliação

A avaliação será composta de:

- Três listas de exercícios: 40% da nota
- Seminários (grupos de + ou - 4 a 5 alunos): 20% da nota
- Uma Prova –formato a definir (ao final do curso): 40% da nota

O aluno que zerar algum item da avaliação ficará com zero de média. Ausência de alguma das avaliações requer atestado médico.

Referências

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Artigos

Introdução ao curso: Revisão

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Um Modelo Comportamental: O Modelo de Roy

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Seleção em Observáveis

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