

Inferência Causal

(orig:Econometria do Setor Público)

2º semestre de 2025

Sextas-feiras de 14:00 a 18:00

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Atendimento: agendar horário.

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Material: SIGAA, 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 ou Double/debiased machine learning for treatment and structural parameters
- (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: Paper empírico que use métodos alternativos baseados COnditional Average Treatment Effect.
 - 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: Paper empírico que use Staggered Differences in Differences , Synthetic Differences-in-Differences.
 - iii. Local Average Treatment Effect
 - iv. Regressão com descontinuidade (RDD).
 - v. O efeito do tratamento nos quantis. IVQTE
 - vi. Seminário de alunos - grupo 5: Paper empírico que use Random Causal Forests ou Paper empírico que use Robust RDD (Cattaneo et al).

3 Cronograma Aulas

O Cronograma inicial encontra-se na tabela 1.

Tabela 1: Tópicos de aulas

Tópicos	Sequência
Aula 1: Estimador MQO, Variância do Estimador, Variância Robusta, Endogeneidade.	25/10
Aula 2: Mínimos Quadrados Empilhados, Efeitos Fixos, Primeiras Diferenças, Efeitos Aleatórios.	25/10
Prática com R (por vídeo gravado)	25/10
Aula 3: Estimador de Variáveis Instrumentais, Mínimos Quadrados em Dois Estágios, Estimador de Wald.	01/11
Aula 4: Modelo de Roy/Borjas (Função Controle)	01/11
Aula 5: Experimentos randomizados.	08/11
Aula 6: Tamanho da amostra, tamanho do efeito e poder do teste.	08/11
Aula 7: Matching e o uso dos propensity scores e regressão com covariadas	22/11
Prática com R	22/11
Aula 8: Controle sintético	29/11
Prática com R	29/11
Aula 9: Método de diferenças em diferenças e suas extensões	06/12
Seminário grupo 1 e Seminário grupo 2	06/12
Aula 10: Local Average Treatment Effect	20/12
Prática com R	20/12
Seminário Grupo 3 e Prática com R	10/01
Aulas 11 e 12: Regressão com descontinuidade (RDD).	17/01
Aula 13: O efeito do tratamento nos quantis. IVQTE	24/01
Seminário Grupos 4 e 5 e Prática com R	31/01
Prática com R	07/02
Entrega da prova	15/02

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% +10%
- Seminários (grupos de + ou - 3 alunos): 20% da nota
- Uma Prova –take-home: 30% da nota

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

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Artigos

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Introdução à Avaliação de Políticas Públicas

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