Winter 2024

Econometrics 220E

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1 Organization

1.1 Class

Monday/Wednesday, 2:00pm-3:20pm, SSB 107

No class on Monday, January 15 (Martin Luther King, Jr. Holiday) and Monday, February 19 (Presidents' Day Holiday)

1.2 Office hours

By appointment (Zoom or in-person). Please email me.

2 Course outline

Econ 220E covers the econometric foundations of popular causal inference and high-dimensional methods. It is designed to complement the many available excellent applied and methods courses, such as Econ 250A.

The following is a tentative outline of the course, including the main references. Additional papers and resources are referenced in the lecture.

1. Unconfoundedness

[Koenker and Bassett (1978), Heckman et al. (1997), Imbens (2004), Koenker (2005), Angrist and Pischke (2009), Imbens and Wooldridge (2009), Wooldridge (2010), Chernozhukov et al. (2013), Imbens and Rubin (2015), Chernozhukov et al. (2020)]

2. Instrumental variables with heterogeneous effects

[Imbens and Angrist (1994), Angrist et al. (1996), Abadie (2003), Heckman and Vytlacil (2005), Angrist and Pischke (2009), Imbens and Rubin (2015), Huber and Wüthrich (2019), Blandhol et al. (2022)]

3. Econometrics of experiments

[Angrist and Pischke (2009), Lee (2009), Gerber and Green (2012), Imbens and Rubin (2015), Athey and Imbens (2017), Muralidharan et al. (2019), DiNardo et al. (2021)]

4. Program evaluation with panel data

[Abadie and Gardeazabal (2003), Abadie et al. (2010), Athey and Imbens (2006), de Chaisemartin and D'Haultfoeuille (2022), Doudchenko and Imbens (2016), Abadie (2021), Chernozhukov et al. (2021), Roth et al. (2022), Roth and Sant'Anna (2022)]

5. High-dimensional methods

[Hastie et al. (2009), Belloni et al. (2014), Hastie et al. (2015), Chernozhukov et al. (2018), Wager and Athey (2018), Knaus et al. (2021), Chernozhukov et al. (2022), Hansen (2022)]

3 Grading

3.1 Two paper summaries (25% each, 50% in total)

3.1.1 Papers

You can choose two of the following three papers.

- 1. Angrist et al. (2006) (Theorem 1)
- 2. Sun and Abraham (2021) (Proposition 1)
- 3. Semenova (2023) (Lemma 1)

3.1.2 Format

The summaries should contain the following elements:

- 1. Short description of the paper with a focus on its contribution
- 2. Discussion of the theoretical result indicated in the list of papers, including an intuitive yet formal explanation of the main arguments/steps in the proof. The goal is not to reproduce the proof in the paper step by step but to explain the key arguments in your own words/math and add additional steps if needed.
- 3. Critical assessment including the main strengths and weaknesses of the paper

Format: 4–5 pages (1.5 spacing, 12pt), excluding references

3.1.3 Deadlines

- 1. Summary 1: February 18, 11:59pm
- 2. Summary 2: March 4, 11:59pm

3.2 Monte Carlo study (50%)

Choose an econometrics paper, which:

- 1. is related to the course topics,
- 2. was published at least at the top-field level after 2014 (exceptions are possible; please check with me), and
- 3. is not discussed in detail in class.

Please check with me to get my approval as soon as you have made your choice.

The assignment should contain the following elements:

1. Summary of the paper

- 2. Description of the theoretical properties of the method proposed/analyzed in the paper
- 3. Monte Carlo simulations investigating these theoretical properties. The simulations should be based on two different data-generating processes and demonstrate a case where the method works and a case where it does not. These data-generating processes should be motivated by the theoretical assumptions and results.
- 4. Replication package including instructions on how to run the code

Format: The assignment should contain about 8 pages of text (1.5 spacing, 12pt) and no more than 4 additional pages with tables and figures.

You may work in groups of three students (all students will get the same grade). Deadline: March 21, 11:59pm

References

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