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Evaluating Education Policy Through the Lens of Economics[1]

Course Info
14.###
12 units
Time [TBD, 1.5 ×2/week]
Location TBD

Instructor Info
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they/them
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Course Description

The high-level overview of what this class is about.

Who is college good for? What classes should students be required to take? What causes inequity in education? What makes good teaching? How should school admissions systems work? What meterstick should we use to measure the "success" of education?

There are many possible answers to each of these questions, and it seems like everyone has different thoughts on what the "correct" answer is. Over the past 12+ years of being a student, you've probably thought a bit about how education works (and how sometimes, it seems like it doesn't), and have your own answers. In this class, we won't decide what the "right" answer is (though we'll certainly discuss the merits of many answers) — but what we will do is look at these questions through a specific lens: the economists' toolkit for causal inference.

Economists seek to understand the world using data — how to make use of limited resources, and how to truly say that "X causes Y". We will explore three types of econometric designs: randomized controlled trials, regression discontinuities, and difference-in-differences, which allow us to disentangle causation from correlation. For each, we'll explore why they help show us causality in the real world, the assumptions they need, and how economists have used them to provide evidence on an important policy question. To do this all, we'll rely on understanding the core math behind each and reading papers that utilize these methodologies. We'll also take a critical lens to these papers: critical not in the sense of "disapproving", but rather, in the sense of evaluating the soundness of their arguments and whether the findings extrapolate to other contexts.

However, this course is also about more than just econometric methods; more importantly, we'll engage in dialogue about real-world policy. In this class, you will be asked to have opinions. To have those opinions questioned by those who don't agree and by evidence. You'll need to think critically about your beliefs and others', and be willing to change your mind. The goal of this class is not to find the right answers — it is to help us have more informed opinions, and to understand the multitudes of merits that opposing sides of a debate might have. The success of this course hinges upon the respectful dialogue and critical thinking, a culture we will build up throughout the semester.

Who should take this course?

Information on prerequisites, course goals, and reasons you might want to take this class.

This course serves as an **"intermediate" economics course** between an introductory microeconomics course

[1] Hi KTCPers! If you have thoughts on this syllabus and ways to make it better, I'd love to hear them — please reach out!

and a more advanced econometrics course, while still remaining **accessible to students who have no economics background**.

This course will rely somewhat on an **introductory knowledge of statistics**, including understanding expected values, variance, and tests for significance. We will be providing a lecture on this content, but know that this class, just like economics research, relies on mathematical techniques.

This course is especially intended for students who might be interested in **understanding what economics research is all about**. While economics is one of the most popular majors in the world, very few economics undergraduates get to apply economics to policy questions in the same way that professors and graduate students do.

Intended Learning Outcomes (ILOs)

How will you grow by taking this course?

By the end of this course, you will be able to...[a]

ILO 1. **Recognize** the main types of econometric research designs (randomized controlled trials, difference-in-differences, regression discontinuity, and instrumental variables), and **explain** the assumptions needed to determine causality.

ILO 2. Given a research setting, **assess** whether it meets the assumptions required to determine causal effects and the implications of results (or non-results) for policy.

ILO 3. **Justify** a position on a policy issue while simultaneously evaluating its shortcomings using both quantitative evidence from research and qualitative evidence from your own life experiences and those of your classmates.

ILO 4. **Critique** policy positions and hold dialogue in a respectful, thoughtful manner to collectively come to more informed answers, rather than to prove the "correctness" of your side.

ILO 5. **Propose** a research project that utilizes an econometric research design to evaluate a real-world policy question.

[a] The bolded words here are keywords highlighting levels of Bloom's Taxonomy, a framework for the progression of learning.

More informally, by the end of the class, you'll be equipped with a toolset to:

- Evaluate policy positions of those in the real world, and determine if their evidence is sufficient for their claim.
- Hold good dialogue with others (who you might not agree with) by asking meaningful questions and good listening practices.
- Communicate complicated topics to those who aren't experts in your field.

What to expect in this course

Information on logistics — the "what" of taking this course.

Overall structure

This course has three units. Each introduces one of three different econometric techniques:

Unit 1. Randomized Controlled Trials (RCTs)

Unit 2. Regression Discontinuities (RDs)

Unit 3. Difference-in-Differences (D-in-D)

Each unit broadly follows a similar structure:

- Introduce the math and intuition behind the technique (ILO 1, ILO 2)
- Apply it to an interesting education policy question (ILO 2, ILO 3)
- Have discussions to think through the issue from an economic and social lens (ILO 3, ILO 4)
- A capstone assignment of some description (see more in Assessments) (all ILOs)

The tentative correspondence between units and policy questions is the following:

Unit 1. (RCTs) Is sorting students by ability (aka, "tracking") good?

Unit 2. (RDs) What is the impact of "elite" schools?

Unit 3. (D-in-D) How can we help fix the shortage of teachers?

This topic list is tentative and will be subject to change based on the interests of those in the class — i.e., you!

On active learning

One of the most important aspects of this course is the wide variety of perspectives you and your classmates bring. Multiple learning outcomes of this class rely on learning from each other; as students throughout your lives, you each have experiences that inform opinions on what education should look like. But there are [insert number] different people in this class, and thus [insert number] different opinions. Sharing your experiences and hearing the thoughts of others will help everyone have more nuanced, informed viewpoints of the world; this class will use active learning activities throughout this class, like small group brainstorms and class-wide debates, to help facilitate this sharing. **We all have much to learn from each other; as a result, you are expected to both a) be willing to share your own experiences and opinions in this classroom, and b) to engage with others' opinions respectfully and non-judgmentally.**

To do this effectively, this class requires the engagement of every student in the classroom. While there's no singular metric for "engaged" or "unengaged", various actions that demonstrate engagement include:

- Doing pre-class readings and assignments to the best of your ability
- Thoughtfully contributing to class discussions (both digital and in-person)
- Listening to and respecting the diverse opinions of other students

See also our inclusivity policy for more details.

Course materials

All course material will be available on Canvas.

During class, we will occasionally use smartphones / laptops to answer questions as a group. During days that this occurs, we'll have spare devices to use in case you need one for any reason (you don't own a laptop,[2] you forgot yours at home, it's out of charge, ...).

Assessments

This course features three units, each introducing a different econometric research design. Each unit will include some type of capstone assignment that is designed to help you connect the worlds of academic research and real-world policy. To build up to these capstones, each unit will have a variety of formative assessments to build us up to the capstone, providing multiple avenues for feedback and engagement. Before each assignment (formative and summative), we'll provide both:

- A rubric detailing the grading criteria for the capstone assignment
- Examples of past student work, with comments about what it did well and what could be improved upon

Unit 1. Randomized Controlled Trials (RCTs): at the classroom level (30%)

Capstone Assignment: "Peer Review+" (20%)
There are thousands upon thousands of published studies in the real world, but unfortunately, many results in the academic literature do not end up impacting policy. In this capstone assignment, we'll ask you to choose one of several research papers, and think about it from the lens of a reviewer. Is there evidence that this RCT is balanced? What is the treatment effect being identified? If you were thinking about this study from the lens of a practitioner, what additional data or research questions should be included in this study to have the most impact on policy?

Because you'll be looking at already-published studies, the focus of this assignment is not the same as traditional review (i.e., is the writing clear, are there changes to structure that would benefit the paper, etc.). The "+" in this assignment title means that you'll be thinking about this more from the perspective of a practitioner who's trying to read studies and see if it'd help their day-to-day job.

Formative Assignments (10%)
This unit will include the following formative assessments spread across several class sessions:

- Class 3: Group work analyzing studies for balance and treatment effects
- Class 4: In-class discussion of shortcomings of a study
- Class 6: Outlines for your capstone assignment, with instructor feedback

Unit 2. Regression Discontinuities (RDs): using policy quirks (30%)

Capstone Assignment: Policy Memo (20%)
Research needs to be shared with people who can act on it; doing so requires communicating the most important context, findings, and limitations of studies. In this assignment, you'll be asked to read a paper using the paper-reading and research-interpreting skills we have learned and practiced over the previous few weeks, and write a one-page memo about it to a policy-maker who lacks the same economics background as you. Following the norms we'll build up in this class, you'll then need to demonstrate your understanding of its main argument, assess whether the study assumptions are plausible, and communicate those results

[2] If this is the case for you, I encourage you to reach out to me to help find resources for your academics more broadly. I can help direct you to the right person at Student Financial Services, or work with the economics department to try and provide you with a device.

without heavy technical jargon. Importantly, policy-makers should not listen to the results of a singular paper, and you should further support your argument and add caveats by integrating other pieces of evidence from your own experiences, classroom discussions, and other papers we've read.

To be explicitly clear: in this assignment, you are not expected to agree fully with this paper. However, you are expected to take a stance on whether you agree with it or not. You'll be graded on your explanation of the study's assumptions, your interpretation of the results, and how well you support your policy recommendation. In addition to a "main" grade for this assignment, your feedback will include questions that we think a non-economist policy-maker might have, who might have questions about the study design, the nuances of your argument, or any pieces of evidence that are relevant to them. You'll be able to earn ½ of any missed points back by responding to this "policy-maker's" comments in a thoughtful, thorough way (allowing you to demonstrate further whether you meet the unit's ILOs).

Formative Assignments (10%)
This unit will include the following formative assessments spread across several class sessions:

- Class 2: group in-class work (ungraded)
- Class 3: Discussion post with interpretation and questions about an RD paper, and in-class discussion about said paper
- Class 4: Homework with examples of RDs, with questions about reasons that this research design meets (or doesn't) the RD assumptions for causality
- Class 6: In-class discussion of a paper read outside of class (which will most closely mimic our capstone)

Unit 3. Difference-in-differences (D-in-D): when policy changes (40%)

Capstone assignment: research study proposal (25%)
To end this class, we'll start putting you into the shoes of economists, who analyze the effectiveness analyzing real-world policies. Study designs don't pop out of thin air, but instead are the result of careful consideration and analysis. In this capstone, we'll ask you to propose a study utilizing a difference-in-difference technique to analyze a well-posed policy question of your choice. You'll need to describe the specific setting, policy change, and comparison groups of interests. Research studies need data, and so you'll also be asked to either (a) identify a publicly-accessible dataset that can answer your research question, or (b) an agency/organization that has this data, and reasons that they should collaborate with you on this project. Finally, we'll ask you to think about the "so what" of your study. There are many different results that you might find — what does each mean for policy? what aspects of real-world policy aren't being captured by this study? are there any additional nuances to consider?

Your grade on this assignment will reflect the quality of your proposed research project (particularly surrounding its identification), your analysis of its implications, and your ability to communicate this all clearly and thoughtfully. With this assignment, we hope to connect you to policy as much as possible.

Formative assessments (15%)
Coming up with research designs is difficult; even as a professor, it is still difficult to find settings to answer questions that we're interested in with clean identification and available data. To help us build up to this capstone, we'll include several formative assessments, including:

- Class 2: Research question + setting proposals

- Class 4: Proposed datasets/partners
- Class 7–8: A capstone rough draft, with peer + instructor feedback

Course policies

Expectations we will hold you to as a part of this class.

Just like every other class you've taken in life, this course has policies surrounding late work, attendance, collaboration, and more. This section is meant to tell you not just the *what* of these policies, but also the *why*. When I was a student, professors frequently presented these without a pedagogical explanation; I want to help you understand how the policy choices we've made contribute to your learning in course design.

Collaboration and integrity

Research, much like work in general, is inherently collaborative. On many assignments this semester, including homework and assignments labeled as "groupwork", you are allowed and encouraged (and in some cases, required) to work with others. When you collaborate, you'll be asked to acknowledge the people you worked with by name. For assignments where collaboration is optional, you can work together to brainstorm, solve math, or read a paper, but you are asked to do write-ups individually without referring to the work of your peers, so that your work can reflect your understanding of the material, and not give you an unfair advantage over your peers.

The Institute maintains an academic integrity policy, and you will be held to it throughout this class. Violations, including plagiarism, unauthorized collaboration, and cheating, will result in official Institute sanctions.

If you ever have questions about academic integrity, please feel free to reach out to me over email.

Attendance + class participation

Attendance is critical to your success in this class. Many of our ILOs rely on discussion with your peers (see more in the section on active learning). These types of conversations cannot happen honestly and vulnerably online, or in any make-up form. Attendance does not directly count for your grade, but participation in this classroom's activities will be, as described in the section on assessments.

Late assignments

Every assignment will come with a due date. You can automatically apply for a 24-hour extension by filling out this form **(TODO: add link)** **before** the deadline passes. On it, you'll be asked to describe why you need an extension and how an extra day will support your learning. We have this system to help you "take charge" of your own learning, trusting in you all to be responsible students and adults.

If you find yourself needing more than a 24-hour extension, such as for medical or family emergencies, a religious observation, or other extenuating circumstances, please reach out to me as soon as possible. I want to work with you to help make sure you can complete assignments in a way that aligns with your capacity while still aligning with the goals of this class.

Using AI and LLMs

It is your responsibility to ensure that you personally understand the course material, so be sure you devote concentrated, independent effort to all work in this class. **You may use large language models to assist with**

superficial grammatical corrections of your writing, but not to provide or suggest content. In all cases, you remain personally responsible for the originality, correctness and quality of your submissions.

At the end of the day, LLM tools like ChatGPT are here to stay. However, your understanding of the material, your discussions with peers, and your growth through this class all require engagement from you — the living, breathing, physical you. No LLM can replace your thoughts, perspective, and personness.

Other Tools, Resources, and Tips

How can you help yourself (and your peers) succeed?

Office hours

This class has office hours run by both the course TAs and me. You can (and in fact, are recommended to) come to office hours for many purposes, including (but not limited to):

- Asking for clarification or further elaboration on lecture content
- Nudges and assistance on problem sets
- Advice on economics at MIT (recommended courses, research opportunities, ...)
- Advice on economics as a field (career options, skills needed for different jobs, info on economics graduate school, ...)
- Advice on navigating MIT (advising options, tutoring centers, academic policies, ...)
- What things do I do for work (what life as a professor looks like, what I'm currently researching, thoughts about papers I've worked on, reflections on my economics journey, ...)

I'll always prioritize material about this class during OH (i.e., the first two bullet points above), but I want to be explicit that office hours are for much more than that — they're aimed at supporting you in the many ways that support exists.

You might also have a sensitive topic you want to discuss with more privacy — grades, personal circumstances, concerns with the class, and more — if this ever is the case, please reach out to me or anyone on the teaching staff, and we'd be happy to talk. You can also reach out anonymously at this link **(TODO: add link)**, though that limits our ability to respond personally to your concerns.

On inclusivity

Everybody belongs in this classroom. No difference, visible or nonvisible, should make anyone feel like they cannot or should not contribute to this class.

Doing this is much harder than simply writing it. It requires the buy-in of every person to create an environment where people are treated with respect, where people feel welcome to share their opinions, and where people can interact without judgment. It requires me, as a professor, to demonstrate these behaviors every day. It requires you, as individuals, to be willing to speak up to share your own beliefs, to hold each other accountable to create such an environment, to listen thoughtfully and with respect, to assume best intentions, and to work to understand each other's viewpoints.

In our first class session, we'll talk about the norms that we want to hold in this classroom and how we can help everyone feel welcome. This environment fosters learning and good dialogue and is critical to the

success of our class. If, at any point, you do not feel like this is true, please send me an email or reach out to me anonymously at this form **(TODO: add link)**.

Disability-related accommodations

If you need disability-related accommodations, please meet with me as early as you can in the semester. Making sure that all students can participate equally in our class is vital to the success of our course, and we want to talk with you to help make this happen.

Note that disability-related accommodations are managed at an institutional level by Student Disability Services; if you don't yet have approval for accommodations, please reach out to them at sds-all@mit.edu during the first week of classes.

Resources at MIT that you can use

You are not alone at MIT. There are resources for truly *any* type of issue you may have. Asking for help is not a sign of weakness; it's a sign of honesty and self-awareness. Everybody becomes who they are due to the influence of others; no one can do it alone. I'd encourage you to read this blog from a good friend of mine.

A partial list of all of the resources that exist include:

- S3 (Student Support Services), for when you're feeling overloaded, have a medical issue that is impacting your coursework, or generally need support
- MIT mental health resources. Mental health, just like physical health, sometimes requires you to find support. Just like visiting the doctor, mental health care can be preventative. There is no bad reason to reach out for mental health support — struggling with motivation, feeling down, anxiety, substance abuse, depression, and so much more. There are several mental health resources on campus, including:
  - MIT Student Mental Health & Counseling Services - Clinicians on Call [617-253-2916],
  - Urgent Care @MIT Medical [617-253-1311]
  - ULifeline Crisis Text Line [Text: "START" to 741-741]
  - MIT Police [617-253-1212]
- DoingWell at MIT, which compiles resources across campus
- Your GRA and/or house team, for helping navigate resources at MIT

Course Calendar

Unit 1. Randomized Controlled Trials: at the classroom level

Randomized Controlled Trials are commonly used in the sciences to understand many natural phenomena. However, they're also used in economics as a way to help us cleanly identify the effects of various policies. We'll begin our class by talking about RCTs through the lens of economics: their design, their internal validity (whether it answers the question we're asking), and their analysis. We'll also think about their external validity — what aspects of the answers extrapolate to other situations. We'll do so to help remind us that academic studies do not tell us everything, and that we need to consider many, many other factors as we think about recommending and implementing policy.

Unit 1 ILOs:

- **Describe** the methodology of a randomized controlled trial and the assumptions needed for the study's results to represent a causal effect.
- **Interpret** the results of an RCT in an economics paper, **analyze** the paper's identification strategy and policy relevance, and clearly **communicate** these findings to a non-economist.
- **Employ** principles of good discussion — thoughtfulness, question-asking, and active listening — in our classroom discussions.

Unit 2. Regression Discontinuity: using policy quirks

In this unit, we will discuss a second econometric method used to study policy changes: the regression discontinuity (RD). RCTs (Unit 1) are infeasible to run in most settings (you can't just randomize who gets to go to college), and in this unit, we'll learn one way of studying causal effects with observational data. We'll look at policies with sharp (or fuzzy) cutoffs for eligibility, amount, or any other factor — and what that tells us about the effect of this program on its participants. We'll also take a critical look at the shortcomings of RDs — the (strong) assumptions needed to believe them and what they don't tell us — to ensure we don't lose track of the real world.

Unit 2 ILOs:

- **Explain** the assumptions required for an RD to give an unbiased estimate of treatment effects and why each assumption is required.
- Given the design and results from an RD...
  - **interpret** the results from a regression table, including statistical significance and what treatment effect is being estimated,
  - **judge** whether the study meets the assumptions needed to create an unbiased estimate of the treatment effect, and
  - **formulate** specific policy actions combining the RD results and the educational experiences of students in this class.

Unit 3. Difference-in-differences: when policy changes

We'll end our class with difference-in-differences, another frequently-used method to understand the effects of policies. Many policies don't have clean (or fuzzy) cutoffs, and so we can't use RDs. However,

by comparing similar groups that had different treatment statuses, we can help to disentangle the policy's causal effects. We'll use this to look at questions like school funding, curricula requirements, and more, again looking at how to analyze them, what they tell us, and the assumptions we need for our results to be valid. In this unit, we'll also deal with even more challenging and nuanced policy questions, and will have thoughtful, respectful discussions of policies in the classroom.

Unit 3 ILOs:

- **Explain** the assumptions required for a difference-in-differences study to give an unbiased estimate of treatment effects and why each assumption is needed.
- **Propose** a study to address a question of policy importance, and in doing so, **justify** the relevance of your question to policy-makers and how your setting will answer said question.
- **Critique** the ideas of your peers and yourself in a thoughtful, constructive manner.