EXPEREIMENTAL ECONOMICS

Chapter 2
Why Randomize?

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The Overview of Chapter 2

- 2.1 The challenge to measure causal impact
- 2.2 The advantages and disadvantages of the evaluation methods other than experimental approach
- 2.3 How does Randomization help measure causal impact?
- 2.4 The advantages and disadvantages of experimental approaches

2.1
Why It Is Difficult to Measure Causal Impact

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What is Causal Impact?

- The Causal Impact is X → Y
- Example:

  Uniform Donation as X → Better Grades as Y

WHY RANDOMIZED?

What is a Counterfactual?

- To compare students A, B, and C in this world with A, B, and C in a parallel universe illustrates a perfect counterfactual.

- **A Valid Counterfactual** refers to the characteristics of both *treatment group* and *comparison group* in average should be similar.

Some Problems

- We may find many factors change over time.

- We may also find selection bias ruin our inference of causal impact.

2.2
Advantages and Limitations of Evaluation Methods other than Experimental Approach

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Before evaluation…

- **Comparison group:** mimic what would have happened without the program
- **Assumptions:** specific conditions required for the evaluation method to hold

Qualitative Impact Evaluations (1)

- Quantitative: numbers; qualitative: stories
- Researchers talk directly to participants
- **Advantage:** rich information that is not translated into numbers
- **Comparison group:** implicit, often hidden inside stories

Qualitative Impact Evaluations (2)

- **Assumptions:**

1. Participants have good understanding of the counterfactual

2. Participants assess the outcome with no bias, or the biases can be seen through

3. Researchers have no biases when judging the data

Before-and-after Comparisons

- Measuring how participants changed over time
- **Comparison group:** participants themselves before the program
- **Assumptions:** the treatment group's outcomes remain the same without the program

Cross-section Comparison

- Participant-nonparticipant comparison
- Measuring the difference between program participants and nonparticipants
- **Comparison group:** individuals don't participate in the program
- **Assumptions:** no selection effect, e.g. Taipei & Hualien elementary schools

2.3
How Randomization Can Help Infer Cause

鄭紹鈺 Jheng, Shao Yu

How Randomization Works, Indeed?

- **Randomization**: it helps arrange a valid comparison group, reducing the problem counterfactuals.

- **Randomized Evaluation**: assign participants to each group randomly.

- How does it help mitigate the problem of counterfactuals?

The Magic: Random Assignment

- Both *Observable factors* and *Unobservable ones* are balanced in both treatment group and comparison group.

- The Example: The Problem of Lowest-Income Criterion

Steps of Random Assignment

- 1. Define eligible units of a program.
- 2. Randomly assign units to both groups and only intervene the treatment group!
- We thus make two groups statistically identical by selection of chance.

One More Thing…

- The random sampling and randomized evaluation are not the same.

- So, what is the advantage and disadvantage of experimental approaches?

2.4
Advantages and Limitations of Experimental Approaches

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Tailoring evaluation to question

- **Advantages:** answer the specific question well.
- **Disadvantages:** one evaluation only answer the specific question(s) it was designed to answer.

Generalizability problem

- It is not unique to experimental approach.
- Different behavior within and without experiment.
- Representative participants.
- If it can apply to other conditions…

Few assumptions, transparent findings

- There is no selection bias.
- Less complex analysis helps credibility and transparency of findings.
- The tradeoff between simplicity and research range.

Prospective Evaluation

- **The definition of prospective evaluation**: evaluation designed in advance

- **Advantages:** collect specific data and baseline data

- **Disadvantages:**

  - Costly, again

  - Long term results emerge in the long run

When is a randomized evaluation not useful?

- **When outcomes can only be measured in a very high level**
  - Macroeconomic problem
- **When general equilibrium effects are Important**
  - Outcome is determined by the aggregate of hundreds or thousands of interactions
  - Only possible to study when markets are somewhat separate

Ethical considerations: background

- Belmont principles
- **Respect for persons:** participants should be informed of risks and given a choice about participation.
- **Benefice:** the risks of research should be carefully weighted against the benefits.
- **Justice:** the people who take the risks should be those who benefits.

Cross Culture view on ethical

- **To respect every culture**
- **Change the guideline in different areas**

WHY RANDOMIZED?

What are the benefits?

- **If we answer an important question well, this can have big benefits to society and those who are studied.**

- If we find harm, program can be shut down.

- If we find benefits, program can be extended.

- Learn lessons potentially relevant to other situations.

Review of chapter 2

- **Why is it difficult to measure casual impact ?**
- **Advantages and Limitations of Evaluation Methods other than Experimental Approaches**
- **How can Randomization help infer cause?**
- **Advantages and limitations of the Experimental Approaches**

WHY RANDOMIZED?