

ECNS 432

Ch. 12: Valuing Impacts with
Experiments and Quasi-Experiments

- Chapter 12
 - EXTREMELY RELEVANT FOR MANY OF YOUR RESEARCH PAPERS!!!
 - When I ask you “what is your empirical model/method”, I’m often referring to this stuff!

Experiments and Quasi-Experiments

- CBAs of any intervention require comparisons b/w alternatives
 - The program/policy subject to evaluation is compared to a counterfactual (i.e. the situation that would exist w/o the program/policy)
 - Impacts are measured as differences in outcomes b/w the two situations
- Internal validity: Depends on the particular way in which the comparison b/w the program and the situation w/o the program is made
- External validity: Refers to how well results generalize
- Ex. RCTs in developing countries

Commonly Used Evaluation Designs

- Design 1: Classical experimental design (somewhat of a gold standard)
 - Comparison of net changes b/w treatment and true control groups
- Structure

Classical experiment	Pre-observation	Treatment	Post-observation
Random assignment (treatment)	O ₁	X	O ₂
Random assignment (control)	O ₃		O ₄

- Example: Pilot project of an educational program with random assignment
 - Sex education courses
 - Treatment (abstinence only)
 - Control (general sex educ.)
- Advantages: Q. What does random assignment guard against?
- Ans. Systematic differences b/w control and treatment groups
- Disadvantages: Costly
 - Ethics of random assignment
 - External validity

Commonly Used Evaluation Designs

- Design 2: Classical experimental design without baseline data
- Structure

Classical experiment w/o baseline data	Pre-observation	Treatment	Post-observation
Random assignment (treatment)		X	O ₂
Random assignment (control)			O ₄

- Advantages: Similar to Design 1
- Disadvantages: If random assignment is done incorrectly (i.e. not truly random), then no pre-treatment characteristics available to make statistical adjustments
 - Can be an issue when sample sizes are small

Commonly Used Evaluation Designs

- Design 3: Before and After Comparison
 - No control group
 - No random assignment

- Structure

Before/After comparison	Pre-observation	Treatment	Post-observation
	O_1	X	O_2

- Advantages: Often feasible
Relatively inexpensive
Reasonable when factors other than treatment are unlikely to affect outcome (think of a true exogenous shock)
- Disadvantages: Does not control for other factors that may cause the change (especially problematic when you cannot observe and, thus, control for detailed characteristics for the affected individuals, groups, etc.)
- Ex. Supply-side drug intervention (Dobkin and Nicosia 2009, AER)

Commonly Used Evaluation Designs

- Design 4: Nonexperimental comparison w/o baseline data
- Structure

Nonexperimental comparison w/o baseline data	Pre-observation	Treatment	Post-observation
Treated group		X	O ₁
Quasi-control group			O ₂

- Advantages: Not much!
Feasible, cheap
- Disadvantages: Danger of sample selection bias caused by systematic differences b/w treatment and quasi-control group
- Ex. Compare marijuana use in CA (med. marijuana legal) with marijuana use in UT (med. marijuana illegal) based on post-medical marijuana legalization data.

Commonly Used Evaluation Designs

- Design 5: Nonexperimental comparison w/ baseline data
- Structure

Nonexperimental comparison w baseline data	Pre-observation	Treatment	Post-observation
Treated group	O ₁	X	O ₂
Quasi-control group	O ₃		O ₄

- Most often used technique to evaluate large scale policies where randomized trials would be prohibitively costly
- Advantages: Permits detection of *measurable* differences b/w treatment and quasi-control groups
 - i.e. provides info on how groups differed prior to treatment
 - Can control for “selection bias” based on *observable* characteristics

Commonly Used Evaluation Designs

- Disadvantages: Sample selection bias is still an issue due to *unobservables*

FOR YOUR PAPERS

- Think about the type of experimental design that is feasible