

Economic Tools and Policy Evaluation

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EE469 Guest lecture

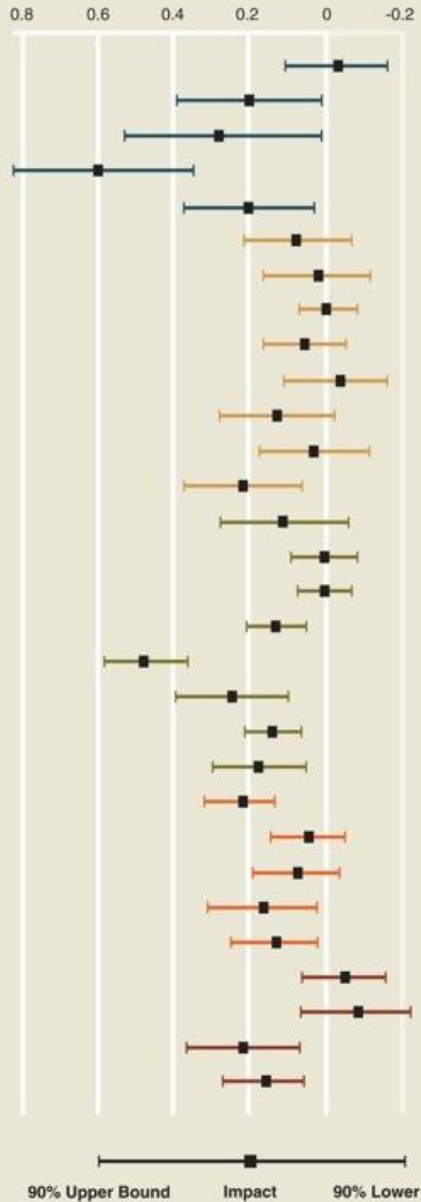


PUEY UNGPHAKORN INSTITUTE
FOR ECONOMIC RESEARCH

Impact on Test Scores (in SD),
with 90% Confidence Interval

Kremer et al. 2013

Additional SD per
\$100 (Log Scale)



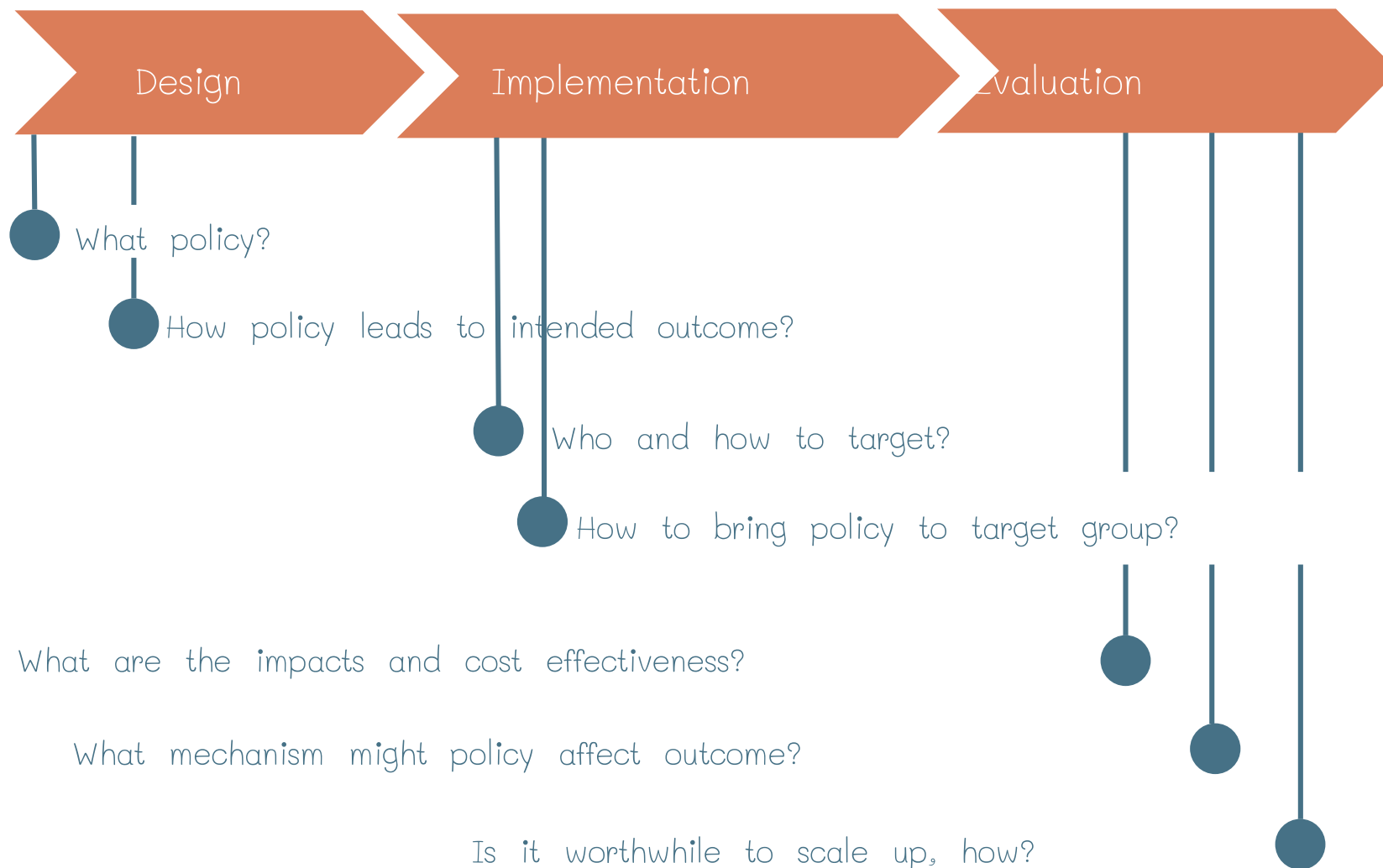
■ Access to Education ■ Business as Usual Inputs ■ Pedagogical Innovations ■ Teacher Accountability ■ School-Based Management

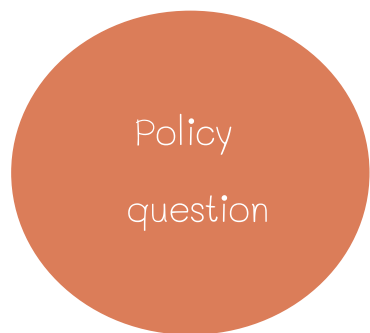
Unconditional cash transfers, Malawi (4)
Minimum conditional cash transfers, Malawi (4)
Girls merit scholarships, Kenya (8)
Village-based schools, Afghanistan (10)
Providing earnings information, Madagascar (16)
Reducing class size, Kenya (20)
Textbooks, Kenya (23)
Flipcharts, Kenya (24)
Reducing class size, India (21)
Building / improving libraries, India (36)
School committee grants, Indonesia (25)
School committee grants, Gambia (37)
Textbooks for top quintile, Kenya (23)
Adding computers to classrooms, Colombia (27)
One Laptop Per Child (OLPC), Peru (26)
Diagnostic feedback, India (39)
Read-a-Thon, Philippines (38)
Individually-paced computer assisted learning, India (21)
Extra contract teacher + tracking, Kenya (19, 20)
Remedial education, India (21)
Tracking by achievement, Kenya (19)
Contract teachers, Kenya (20)
Teacher incentives (year 1), Kenya (30)
Teacher incentives (long-run), Kenya (30)
Camera monitoring, India (28)
Teacher incentives (year 2), Kenya (30)
Training for school committees, Indonesia (25)
Grants & training for school cmte, Gambia (37)
Electing school cmte & linking to local govt, Indonesia (25)
Linking school cmte to local govt, Indonesia (25)



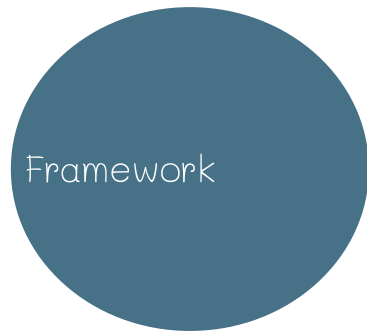
Evidence based policy making: Why?



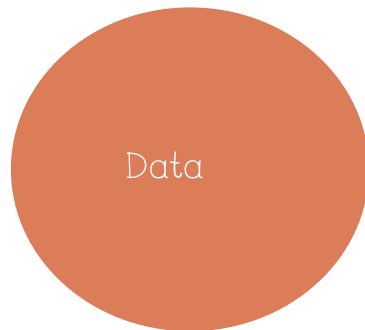




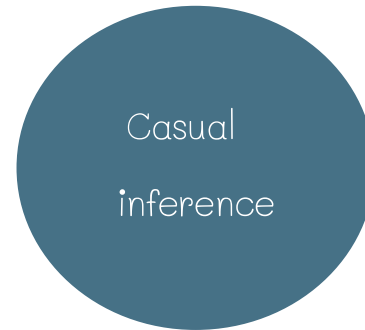
- Macro/micro
- ST/LT



- Mechanism
- Hypothesis

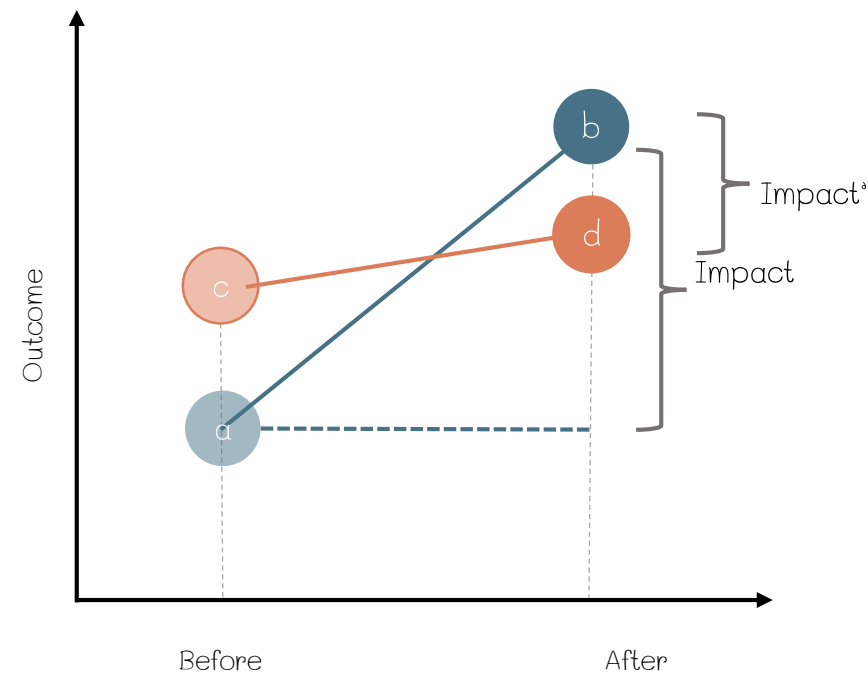
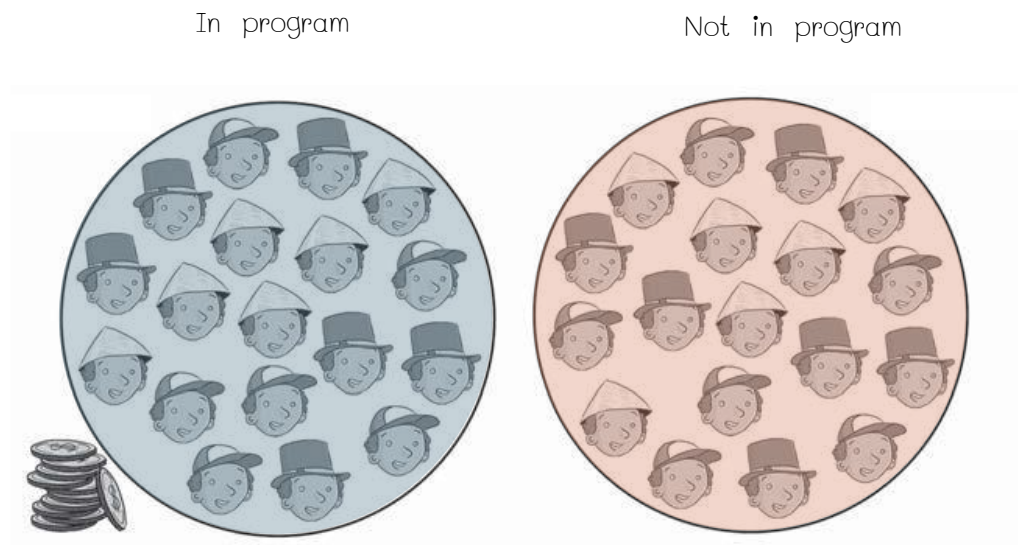


- Existing
- Need to collect



- Difference in difference
- Instrumental variable
- Regression discontinuity
- Matching
- Randomization
- Structural modeling
- Big data & mixed model

- Challenges in measuring impact of **program** on **outcome(s)**



(After) - (Before): Impact = $b - a$ but...other things also happen during the time?

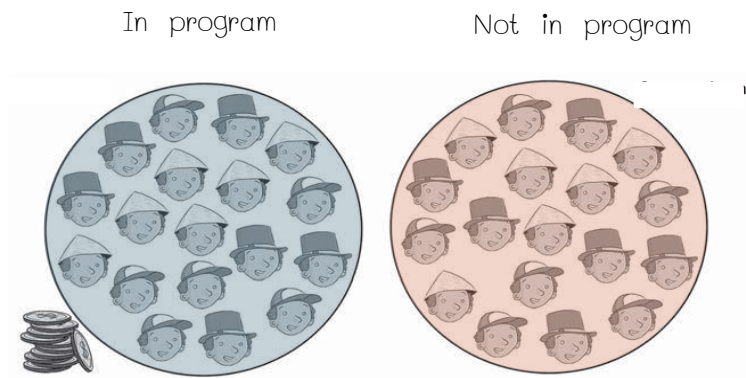


(In program) - (Not in program): Impact = $d - b$ but...are control and

treatment different even before the program? → **selection problem**

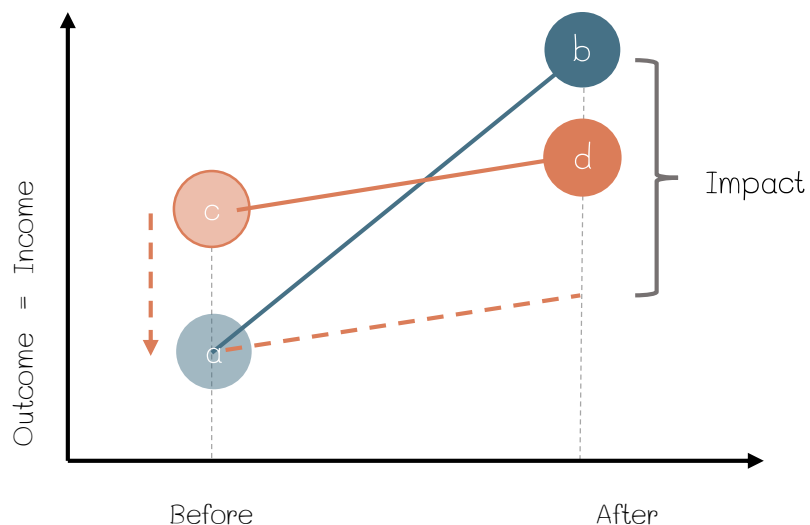
If data before and after program available

Difference in difference



- Compare changes in outcomes over time between treatment and control groups

	After	Before	Difference
In school	b	a	$b - a$
Not in school	d	c	$d - c$
Difference	$b - d$	$a - c$	$(b - a) - (d - c)$



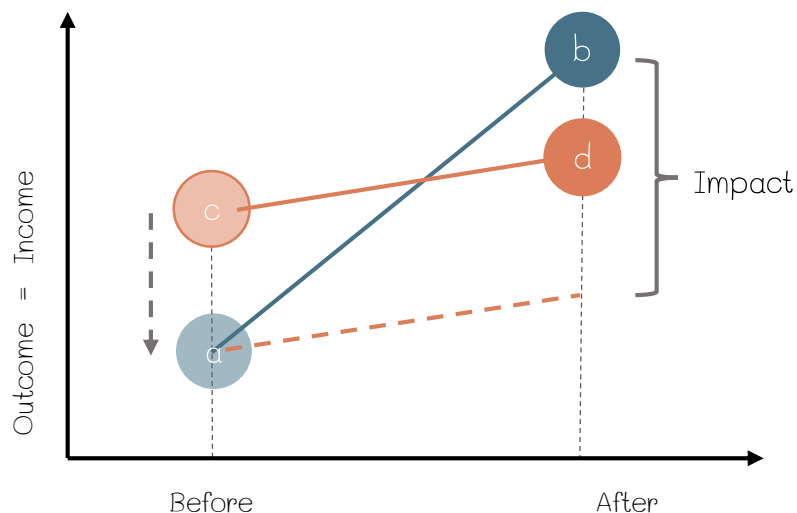
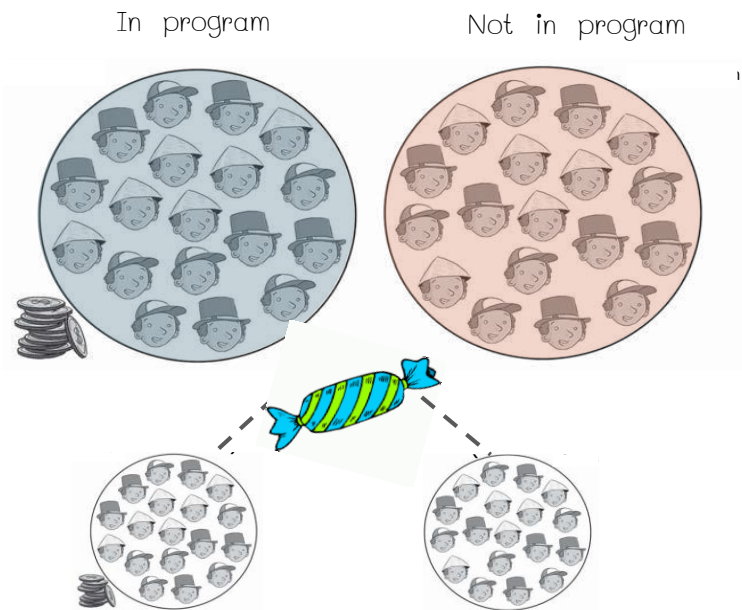
Correct for initial difference of treatment and control groups

Assume both groups move with similar time trend without program

But...do control and treatment change with same time trend?

If data before program **NOT** available

Instrument variable (IV)

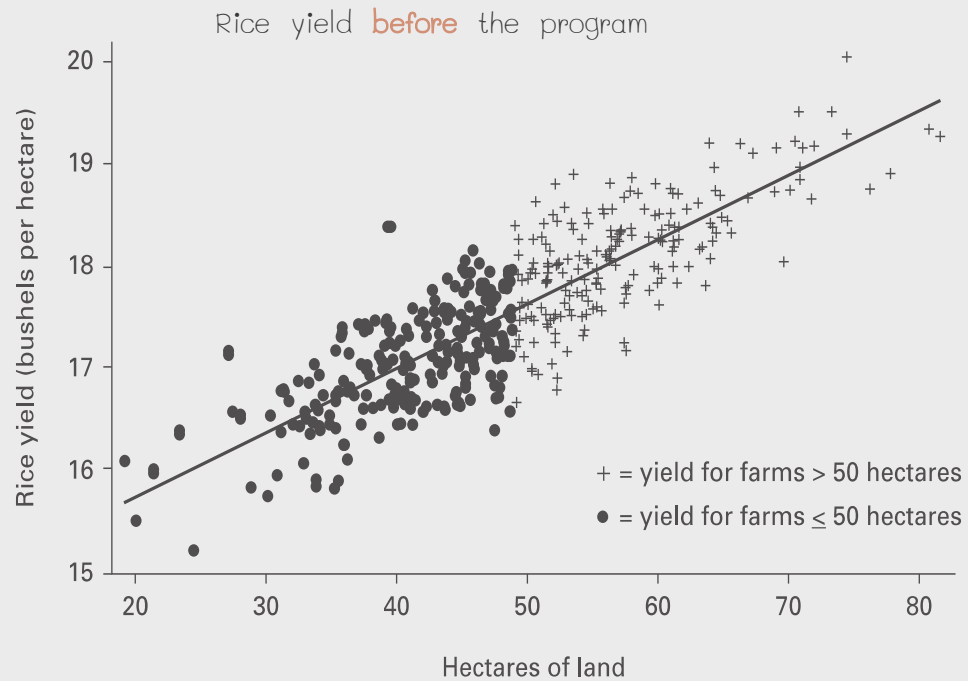


- Find instrument that are not related to outcome but can induce subject into treatment/control groups

Correct for initial difference of treatment and control groups

- Ex) Angrist (1990) estimate impacts of military service on labor outcome
 - IV: draft lottery
- Ex) Angrist and Krueger (1991) estimate effects of compulsory school on earnings
 - IV: quarter of birth in the census

(In the US, students can enter school when they turn 6 in Jan and have to stay in school until they reach 16)



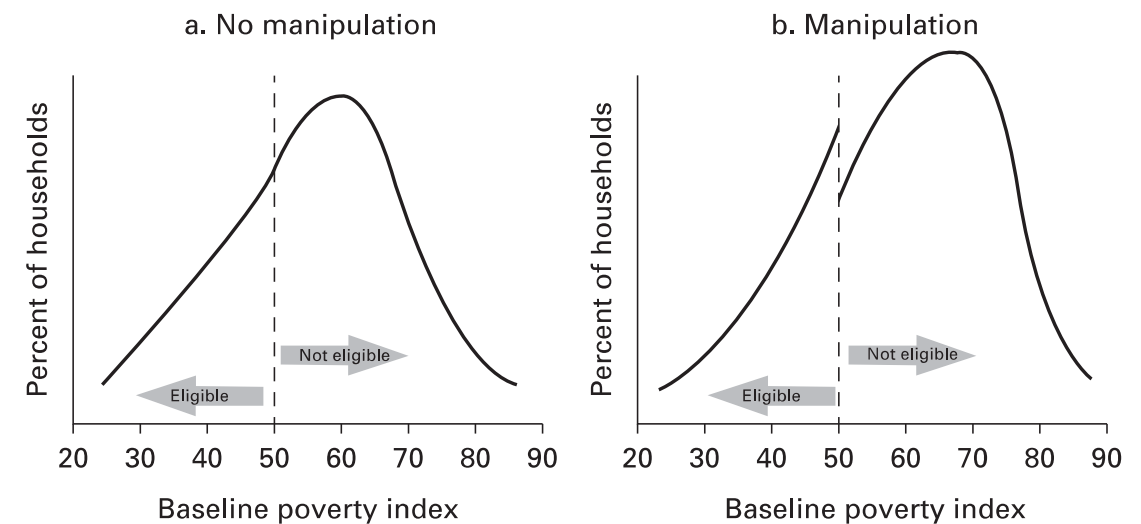
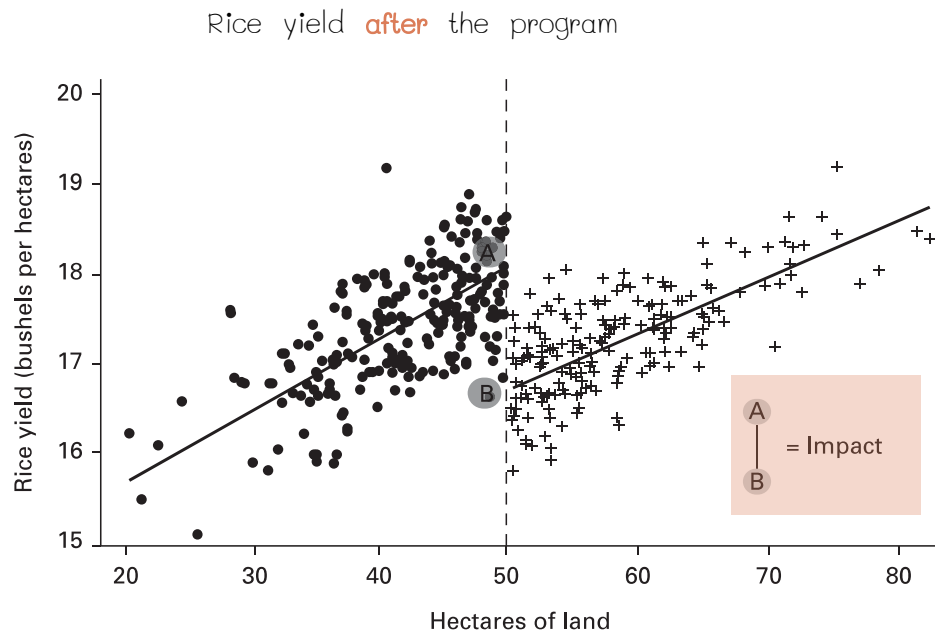
If data before program **NOT** available

Regression discontinuity

Compare control and treatment within the neighborhood of eligibility threshold

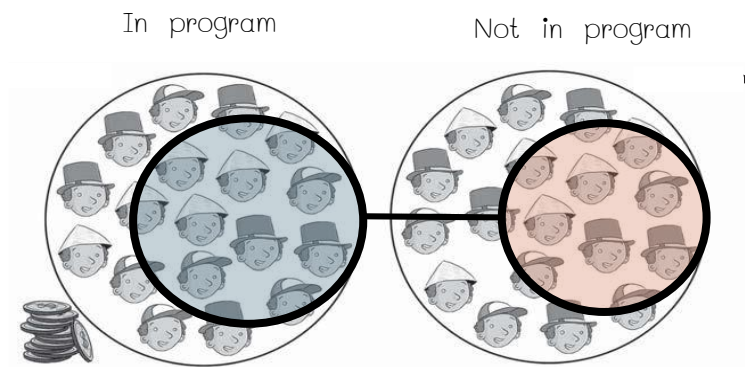
Correct for initial difference of treatment and control groups

Assume subjects cannot manipulate their eligibility ... but



If data before program NOT available

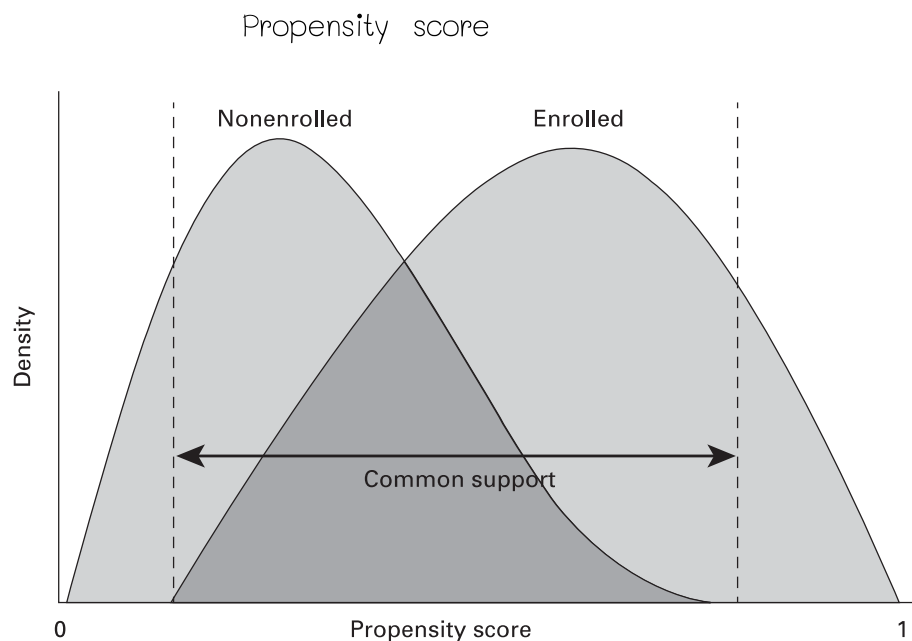
Matching



- Construct control group that have statistically similar to treatment based on observed characteristics

Correct for initial difference of treatment and control groups

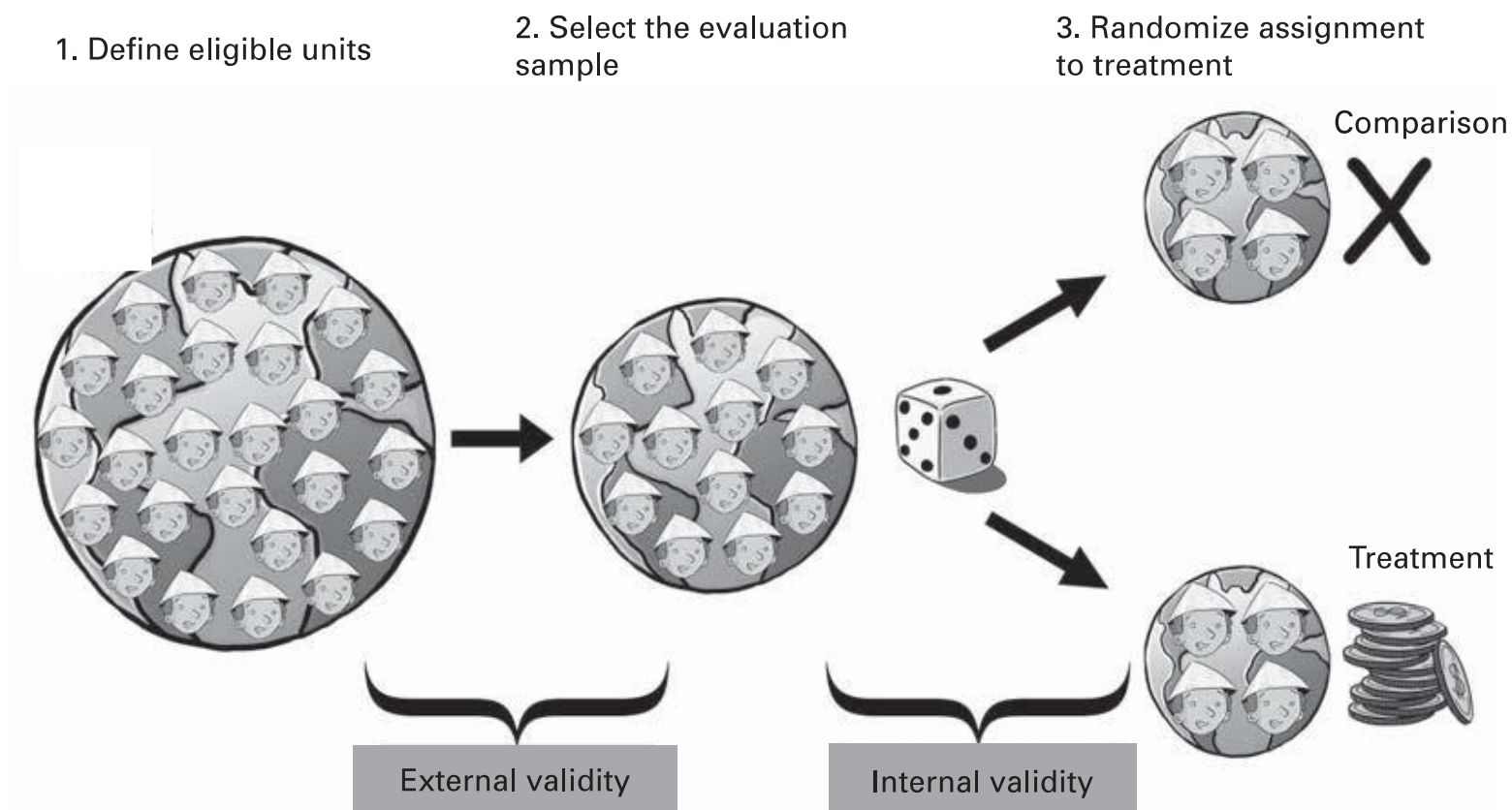
Assume sorting based on observed characteristics



But...how can we ensure that control and treatment are not different based on unobserved characteristics?

- Pure randomization: Randomly assign subject to program (treatment) and control group

Correct for initial difference of treatment and control groups

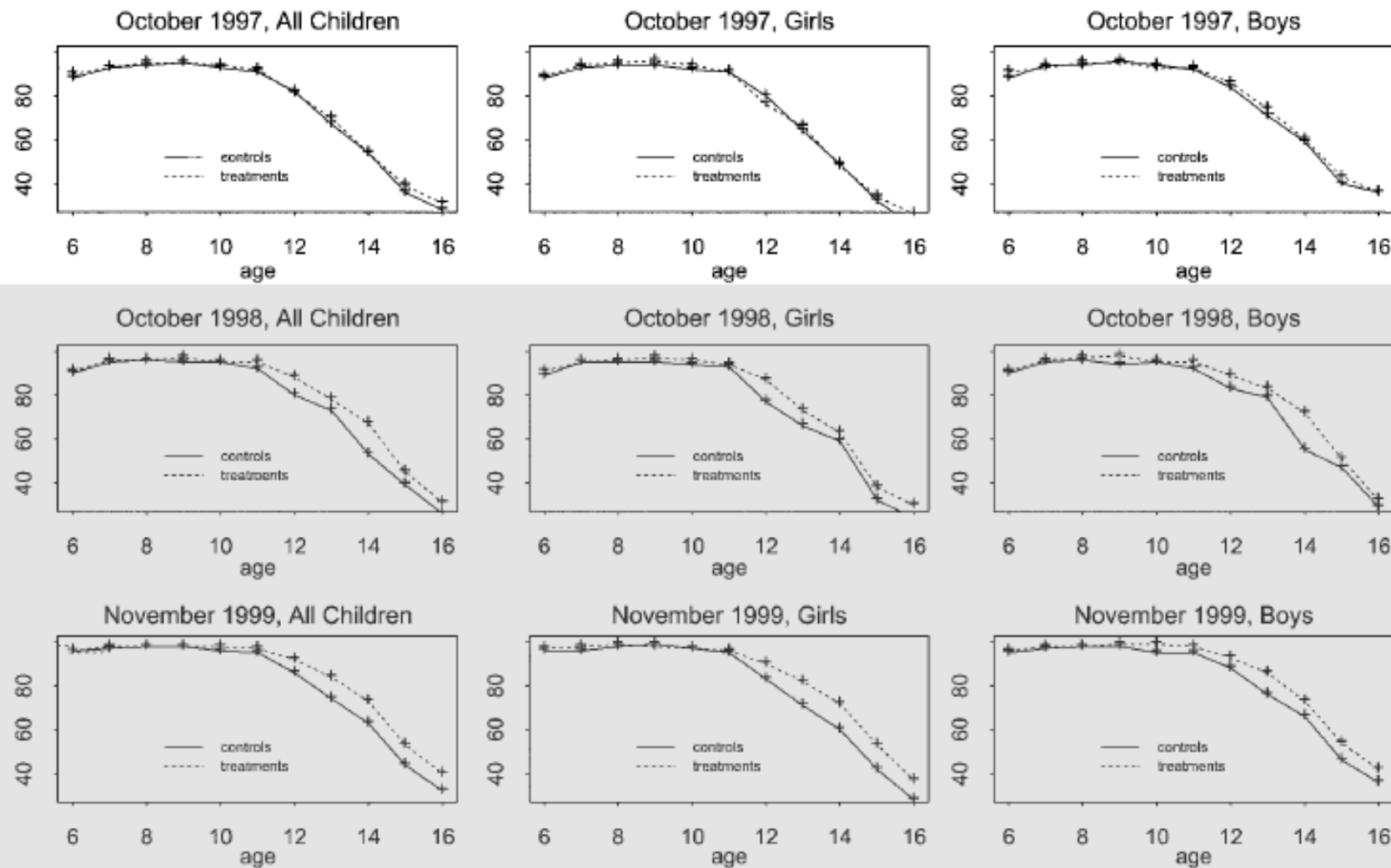


Challenges

- Noncompliance → quasi randomization
- feasible?
- Costly?
- Complex, macro policy
- External validity?

Ex) Behrman et al.(2005) evaluate
Progressa CCT program

- Randomly select villages in
treatment and controls
- Compare eligible households in
control and treatment groups



Other method and the use of big/admin data

- Structural modeling:

- 1) develop model and calibrate with data with good variations
- 2) simulate what would happen to outcome with policy options

Ex) Townsend evaluate Thailand village funds

- Big/admin data: ex) researchers in the US have been exploiting census data

- 1) Cover before and after program
- 2) track for long-term outcomes
- 3) large coverage → external validity and impact heterogeneity

Ex) Duflo 2001, Chetty's work with tax records, etc.

Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment

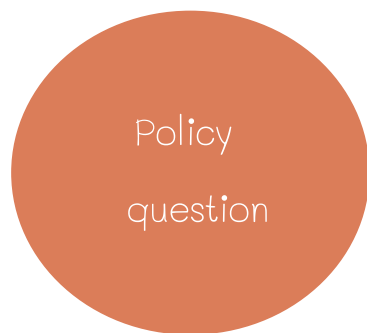
By ESTHER DUFLO*

Duflo's famous paper using Indonesia Census

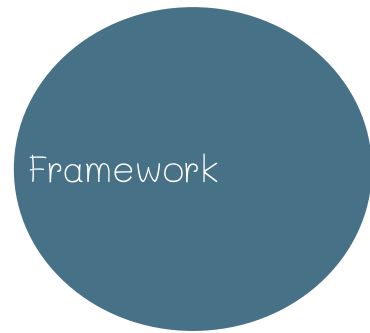
Between 1973 and 1978, the Indonesian government engaged in one of the largest school construction programs on record. Combining differences across regions in the number of schools constructed with differences across cohorts induced by the timing of the program suggests that each primary school constructed per 1,000 children led to an average increase of 0.12 to 0.19 years of education, as well as a 1.5 to 2.7 percent increase in wages. This implies estimates of economic returns to education ranging from 6.8 to 10.6 percent. (JEL I2, J31, O15, O22)

Birthplace Birthday	Years of education			Log(wages)		
	Level of program in region of birth			Level of program in region of birth		
	High (1)	Low (2)	Difference (3)	High (4)	Low (5)	Difference (6)
Panel A: Experiment of Interest						
Aged 2 to 6 in 1974	8.49 (0.043)	9.76 (0.037)	-1.27 (0.057)	6.61 (0.0078)	6.73 (0.0064)	-0.12 (0.010)
Aged 12 to 17 in 1974	8.02 (0.053)	9.40 (0.042)	-1.39 (0.067)	6.87 (0.0085)	7.02 (0.0069)	-0.15 (0.011)
Difference	0.47 (0.070)	0.36 (0.038)	0.12 (0.089)	-0.26 (0.011)	-0.29 (0.0096)	0.026 (0.015)

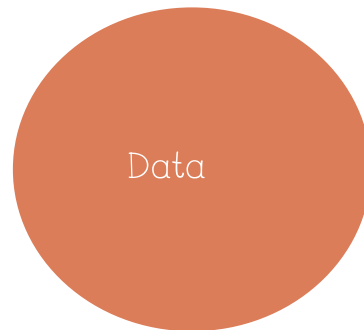
Choosing economic tools to do evidence based policy



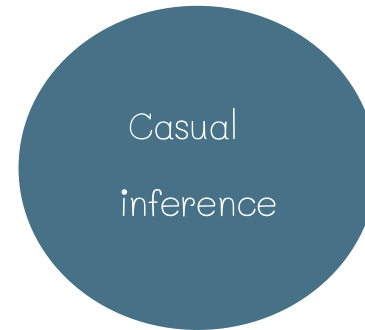
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