Capacity Building workshop on Impact Evaluation of Employment Programs

Quasi-Experimental Designs
Part 1: Regression Discontinuity Design

Maciej Wilamowski, Gdańsk, February 22, 2017
Quasi-experimental methods (require more assumptions)
Recap: need the right proxy for the counter-factual

With large sample, random program assignment ensures two groups have very similar characteristics ON AVERAGE

A lottery ensures the two groups are the same
But what if you **cannot** randomize?

TREATMENT GROUP

CONTROL GROUP

not the same
IE Methods Toolbox

- Randomized Assignment
- Discontinuity Design
- Difference-in-Differences
- Matching
DISCONTINUITY DESIGN
Discontinuity Design

Many programs select participants using an index or score:

- **Anti-poverty Programs**
  - Targeted to households below a given poverty index/income

- **Pensions**
  - Targeted to population above a certain age

- **Education**
  - Scholarships for students with high scores on standardized text
  - Programs for certain age groups (youth, elderly)

- **Labor**
  - Programs targeted on the duration of unemployment
Discontinuity Design

Compare outcomes $Y$ for units just above and below the cut-off point.

Units just above the cut-off point are very similar to units just below it – *good comparison.*
Regression Discontinuity Design-Baseline

Outcome (e.g. probability of being employed)

Score (e.g. age)

Not eligible

Eligible
Regression Discontinuity Design - Post Intervention

Outcome (e.g. probability of being employed)

Score (e.g. age)

IMPACT
For a Discontinuity Design you need...

1) **Continuous eligibility index**
   - e.g. income
   - e.g. age
   - e.g. unemployment spell (months)

2) **Clearly defined cut-off.**

   Participants with a score \( \leq \) cutoff are **eligible**
   Participants with a score \( > \) cutoff are **not-eligible**
   Or **vice-versa**
Example: Progresa CCT

**Eligibility** for Progresa is based on national poverty index (equivalent of a household’s income)

Household is considered poor if *score* ≤ 750

Eligibility for Progresa:
- Eligible if score ≤ 750
- Not eligible if score > 750
Example of Progresa

Score vs. consumption at Baseline - No treatment

![Graph showing the relationship between Poverty Index and Consumption Fitted values. The graph indicates a strong positive correlation, with values ranging from approximately 153.578 to 379.224 on the Consumption Fitted values axis and from 276 to 1294 on the Poverty Index axis.](image-url)
Example of Progresa

*Score vs. consumption post-intervention period-treatment*

30.58**

Estimated impact on consumption (Y)

(**) Significant at 1%
# Progresa Policy Recommendation?

<table>
<thead>
<tr>
<th>Impact of Progresa on Consumption (Y)</th>
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</thead>
<tbody>
<tr>
<td>Case 1: Before &amp; After</td>
<td>34.28**</td>
</tr>
<tr>
<td>Case 2: Enrolled &amp; Not Enrolled</td>
<td>-4.15</td>
</tr>
<tr>
<td>Case 3: Randomized Assignment</td>
<td>29.75**</td>
</tr>
<tr>
<td><strong>Case 4: Discontinuity Design</strong></td>
<td><strong>30.58</strong></td>
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</tbody>
</table>

**Note:** If the effect is statistically significant at the 1% significance level, we label the estimated impact with 2 stars (**). If significant at 10% level, we label impact with +.
Example with 2 thresholds: Cambodia CCT

- **Eligibility** is based on an index of the probability of dropping out of school.
- 2 cutoff points within each school:
  - Applicants with the highest dropout risk offered US $60 per year scholarship
  - Applicants with intermediate dropout risk offered US $45 per year scholarship
  - Applicants with low dropout risk were not offered scholarship by the program
Example with 2 thresholds: Large impact on $45 scholarship

- No scholarship versus $45
- $60 versus $45 scholarship

Advantages of RDD for evaluation

Yields an **unbiased** estimate of treatment effect at the discontinuity

Can take advantage of a known rule for assigning the benefit
  - This is common in the design of social interventions
  - No need to “exclude” a group of eligible households/individuals from treatment
Warning

- **Need a large enough sample** of people around the cut-off. Because only compare who around the cut-off.
- **Majority of eligible subjects must participate.**
- **Not always generalizable:** it tells us the impact of the program for the people around the cut-off.
  - Youth program: would the program have the same impact for very young (16-20 y.o.) and not so young (20-24 y.o.) participants?
  - Progresa: would the impact have the same impact for very poor and not so poor households?
Example: Effect of Youth Job Guarantee on employment [Sweden]

**Program**

**WHAT?** Youth employment program (<25) with in-depth activation once the jobseeker has been registered for more than 90 days at the PES

**WHERE?** Started in 2007, Sweden

| Open unemployment and registration at the PES (3 months) | **The Youth Job Guarantee:** - In-depth assessment and counseling - Job seeking activities with coaching (at least 3 months, normally) | **The Youth Job Guarantee:** - Work experience or training - Job seeking activities at least 4h/week (12 months, max 15 months in total) |

**WHY?** Increase employment among long-term unemployed youth

**Method/Eligibility**

- Registered jobseekers who are unemployed for more than 90 days, and who are <25 years old are **eligible**
- Registered jobseekers who are unemployed for more than 90 days, but who are >=25 years old are **not eligible**

**Data**

Look at two cohorts: **2008** and **2009**

Combine data from PES and Health registries
Example: Effect of Youth Job Guarantee on employment [Sweden]

Results

• Participants in the YJG program increases the probability of finding employment during the first 90 days of the unemployment spell by around 2 percentage points.
• Taking into account that about 28 percent of the 25-year-olds find employment within 90 days, this would correspond to an increase of about 7 percent.

IMPACT = 2 percentage points
(=30%-28%)
Poland:
When can you use RDD?
Examples/discussion

- Family 500+
- Money to start self-employment. (Środki na podjęcie działalności gospodarczej)

Are the above-mentioned programs good candidates to be evaluated using RDD.

- Why? Why not?
- What the eligibility rule should be?
- What the goal of the evaluation should be?
Poland: When can you use RDD?

Family 500+

• Eligibility rule:
  • Disposable income below 800 PLN per person.
  • Below the cutoff the family receives the support for every child.

• Treatment group: Families with one child and income below 800 PLN per person.
• Control group: Families with one child and income above 800 PLN per person.

• Goal of the evaluation:
  • Fertility rate
  • Consumption
  • Results in school of children
  • Effects on labor market

• Problems:
  • Self-selectoin. Families around the cutoff have control of their income.
Poland:
When can you use RDD?
Money to start self employment.

- Eligibility rule:
  - People younger than 30 years old.

- Treatment group: Unemployed younger than 30.
- Control group: Unemployed older than 30.

- Goal of the evaluation:
  - Effect of long run employment.

- Problems:
  - Most of the unemployed that are eligible do not receive the support.
  - People register as unemployed only to be able to apply for the funds. If not for the program they would not register as unemployed and there is a good Chance that they would start the self-employment anyway.
Keep in Mind

Discontinuity Design

- Requires **continuous eligibility criteria with clear cut-off**.
- Gives unbiased estimate of the treatment effect: *Observations just across the cut-off are good comparisons*.
- **No need to exclude** a group of eligible households/individuals from treatment.
- Can sometimes use it for programs that already ongoing.
Test
When is it possible to do regression discontinuity design?

A. When there is a continuous eligibility criteria with a clear cut-off.

B. When there is a comparison group of people who do not receive the program.

C. When government randomly assigns some to receive the program and some not.
Thank you!