HOW TO DISCOVER THE TRUE VALUE OF NON-MARKET PUBLIC GOODS?

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Non-market public goods

• Goods not sold in the market

• Examples:
  – Clean air
  – Hiking trails in a national park
  – Public playground for children

• No market price → no indication of the value of the good

• What may we need the value of non-market goods for?
  – Estimation of benefits from public policy projects
  – Necessary for cost-benefit analyses
  – Measurement of losses from natural damages needed in litigation processes (e.g., BP oil spill)
How to discover the value of non-market public goods?

Revealed preference methods
• use information on actual behavior (e.g., visits to a recreational site)

Stated preference methods
• use surveys specifically designed to elicit information about preferences
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<table>
<thead>
<tr>
<th></th>
<th>Alternative A</th>
<th>Alternative B (continuation of the current policy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entertainment theaters</td>
<td>No change</td>
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</tr>
<tr>
<td>Drama repertory theaters</td>
<td>Tickets for 5 PLN</td>
<td>No change</td>
</tr>
<tr>
<td>Children’s theaters</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Experimental theaters</td>
<td>Tickets for 5 PLN</td>
<td>No change</td>
</tr>
<tr>
<td>Annual cost for You</td>
<td>100 PLN</td>
<td>0 PLN</td>
</tr>
<tr>
<td>Your choice</td>
<td>□</td>
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Source: Our article in the *Journal of Economic Behavior and Organization* 142 (2017), p. 53
How to discover the value of non-market public goods?

Revealed preference methods

- use information on actual behavior (e.g., visits to a recreational site)

Stated preference methods

- use surveys specifically designed to elicit information about preferences
  - can capture both use and passive-use values
  - go beyond existing data (hypothetical states)
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Some skepticism whether survey responses reflect true preferences:
– Possible hypothetical bias
– Lack of economic incentives to answer survey questions truthfully
– Elicitation effects and strategic voting
– Behavioural “anomalies” (e.g., attribute nonattendance, protest responses)
How to discover the true value of non-market public goods?

Make the surveys incentive compatible

Incentive compatibility = Revealing true preferences is the respondent’s best strategy
How to discover the **true** value of non-market public goods?

Make the surveys incentive compatible

Incentive compatibility = Revealing true preferences is the respondent’s best strategy

Necessary conditions for incentive compatibility (Carson and Groves 2007):

1. The survey is perceived as consequential:
   Respondents believe their responses will affect the finally undertaken solution.
2. The authority can enforce the payment (coercive payment).
3. The survey involves a yes-no answer on a single project.
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Recent advancements:
- A sequence of questions (Vossler et al. 2012)
- Open-ended format (Vossler and Holladay 2018)
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STUDY 1

Consequentiality in field surveys

- **Communicated via scripts:** The results of this survey will be shared with policy makers to help inform public decision making.

- **Measured via a follow-up question:** Do you believe the results of this survey will affect the final decision about ...? (Definitely yes – Definitely no)
Consequentiality in field surveys

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• **Measured via a follow-up question**: Do you believe the results of this survey will affect the final decision about ...? (Definitely yes – Definitely no)

• Our study involves both ways of controlling for consequentiality:
  – Four treatments varying the script emphasis on the survey consequentiality
  – Elicitation of perceived consequentiality at the end of the survey

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Your choice

12 choice tasks per person; online (CAWI); 1,700 citizens of Warsaw
Communicated and perceived consequentiality

- Perceived consequentiality significantly affects stated preferences
- Communicated consequentiality impacts stated preferences, though much weaker
- The consequentiality script barely influences consequentiality perceptions
Policy and payment consequentiality

• “Consequentiality describes a condition in which an individual faces or perceives a non-zero probability that

  – their responses will influence decisions related to the outcome in question

  – and they will be required to pay for that outcome if it is implemented.”

(Contemporary Guidance for Stated Preference Studies, Johnston et al. 2017)
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• But perceptions of consequentiality are typically assessed on the basis of a single, general question

• We, instead, measure the perceptions towards the two aspects of consequentiality
## Policy and payment consequentiability

- 6 choice tasks per person; in-person (CAPI); 800 Polish citizens
- Public-good scenario: Development of renewable energy sites

<table>
<thead>
<tr>
<th>Distance of a site from residential areas</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 m</td>
<td>2500 m</td>
<td>300 m</td>
<td>900 m</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size of a site</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large (35-50 turbines)</td>
<td>Large (15-25 tanks)</td>
<td>Small (0.5-5 hectares)</td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of sites</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Share of the area protected from renewable energy expansion</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>50%</td>
<td>10%</td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy transmission lines</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underground</td>
<td>Underground</td>
<td>Overhead</td>
<td>Overhead</td>
<td></td>
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<th>Change in the electricity bill per month (per year)</th>
<th>Wind energy</th>
<th>Biomass energy</th>
<th>Solar energy</th>
<th>It does not matter to me</th>
</tr>
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<tbody>
<tr>
<td>+30 PLN (+360 PLN)</td>
<td>-10 PLN (-120 PLN)</td>
<td>+30 PLN (+360 PLN)</td>
<td>0 PLN</td>
<td></td>
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| My choice                                           | □           | □              | □            | □                      |
STUDY 2

Policy and payment consequentiality

- Distinctive effects of policy and payment consequentiality
- Consequentiality enhances preference towards the project (rather than the status quo), with the effect being stronger for policy consequentiality
- Policy consequentiality lowers cost sensitivity, while payment consequentiality increases it
Alternative preference elicitation formats

- Empirical literature abundant with evidence on elicitation effects: Different formats often yield different value estimates
- A lab experiment with evaluation of an actual environmental good (tree planting)
- Four formats examined: single binary choice, double binary choice, payment card, open-ended
- All formats implemented as incentive compatible
- No elicitation effects found
Closing thoughts on incentive compatibility

• New hope for advancing stated preference methods
• Improvement of data quality and reliability of non-market value estimates
• Broader application of the methods for policy purposes
• Importance of further development, given no other methods for assessing passive-use values
• Some remaining issues, potentially solvable by future research, e.g.:
  – Difficulties with measurement of consequentiality perceptions
  – Possible behavioural causes of elicitation effects in field surveys
HOW TO DISCOVER THE TRUE VALUE OF NON-MARKET PUBLIC GOODS?

By using incentive compatible tools

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