

Willingness to pay for national climate change mitigation policies: Question format and scope effects

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Introduction

Political context

- Germany has set itself ambitious GHG reduction targets of 40% by 2020.
- It is estimated that with ongoing mitigation policies a reduction of 33% can be achieved (BMUB 2014).
- To close the gap, ongoing policies must be tightened and new measures have to be introduced.

→ Is the general population willing to pay for the proposed increase in GHG reduction?

Practical problems with elicitation of WTP

- Different question formats imply different psychological and strategic response incentives and therefore yield different WTP values.

→ Which format produces a WTP that is closest to "real" WTP

Response incentives

Two rivalling explanations about procedural variance in contingent valuation.

1 Strategic Incentives (Carson and Grooves 2007)

- In OE and Payment Ladder respondents can pretend to have lower WTP to secure provision at the lowest possible price: OE and Payment Ladder underestimate WTP.

2 Uncertainty (Flachaire and Hollard 2007, Ready et al 2001)

- In OE and Payment Ladder subjects tend to give an amount they are certain they would pay.
- In DC if respondents are uncertain weather they would really pay the given amount, they tend to say yes: DC overestimates WTP.

Question Formats

The question formats tested are:

1 Dichotomous Choice (DC) advisory referendum (DC)

Respondents can vote YES or NO in a hypothetical referendum.

- No strategic misrepresentation.
- Strong psychological incentive to say yes (yea-saying) which occurs if respondents neglect the economic costs in favor of a supportive expression to the programme (Green et al. 1998; Blamey et al. 1999).
- Expected overestimation of WTP.

2 Dissonance minimizing (DM) referendum (Blamey et al. 1999)

In addition to YES/NO options subjects can state to support the programme, but that they would not be willing to pay the given amount.

- Addresses the problem of yea-saying directly.
- Opens the possibility for strategic misrepresentation.
- Expected underestimation of WTP.

3 The two-way payment ladder (PL) (Voltaire et al. 2013)

On one side subjects select an amount they would be definitely willing to pay and on the other side they select an amount they would be definitely no more willing to pay.

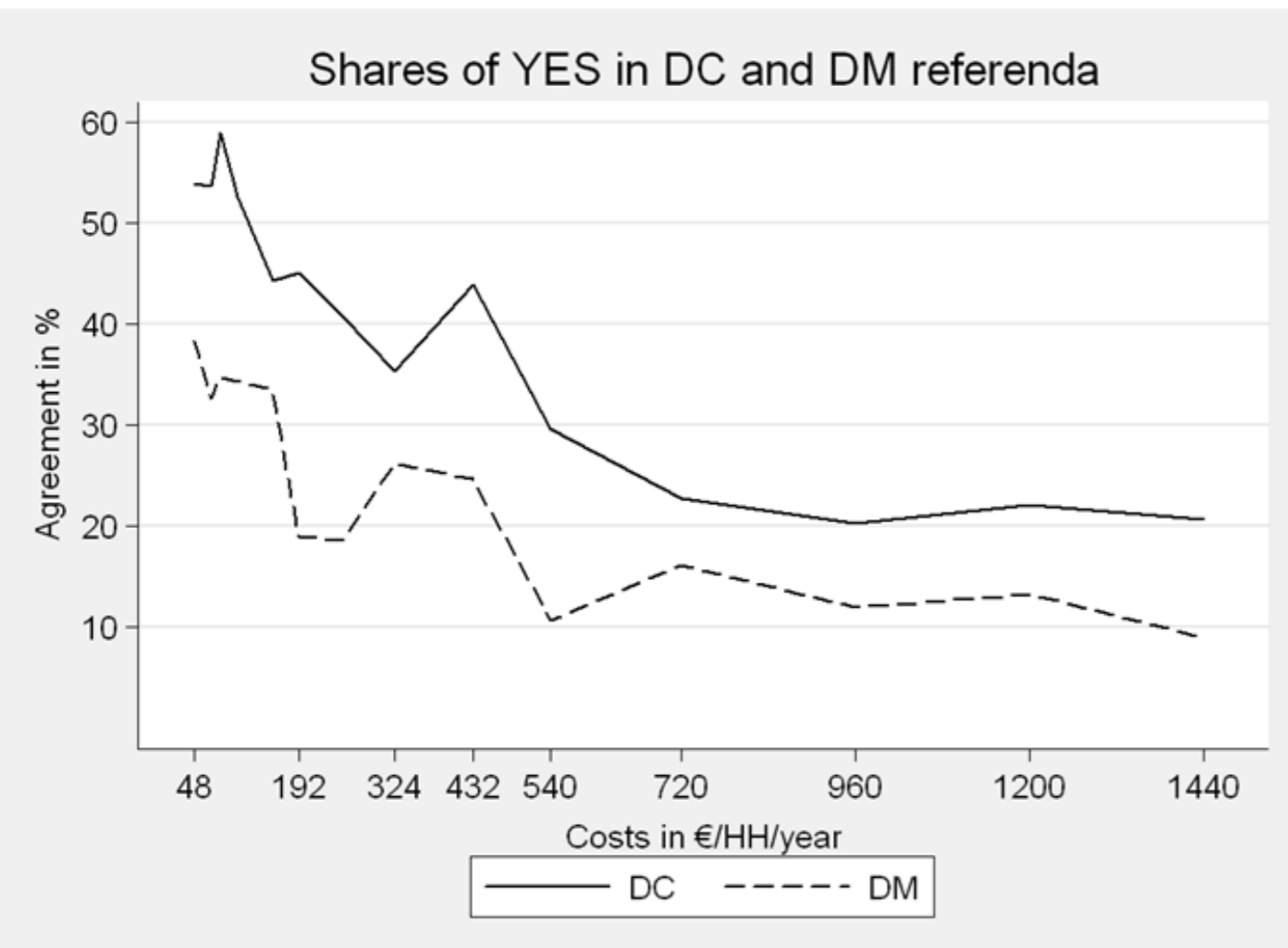
- Gives the opportunity to express their WTP in an interval.
- No yea-saying, but strategic misrepresentation.
- Expected underestimation of WTP.

Hypotheses

H1 $WTP_{DC} > WTP_{DM}$

H2 $WTP_{DM} = WTP_{PL}$

CV responses



Non-parametric WTP estimates (€/HH/year)

	DC	DM
Turnbull WTP	403	205
[95% CI]	[380; 425]	[192; 218]
Unrestricted WTP	418	241
Median WTP	108-156	0-48
N	1844	1859

H1 is supported: WTP_{DC} is stat. different from WTP_{DM} with $p < 0.01$ (two-tailed)

WTP in Payment Ladder

	PL min	PL max
∅ PL	90	257
Median WTP	48	108
N	951	951

Typical expenditure data: Large share of zeros and highly non-normal.

WTP_{Ladder_max} is close to the unrestricted Turnbull WTP of the DM referendum format.

H2 ?

Test for equality of WTP_{DM} and WTP_{PL}

Construct artificial referendum data from Payment Ladder:

- Randomly assign a cost level to each observation in the payment-ladder group.
- Create an indicator that is zero if chosen WTP is smaller than assigned a cost level and unity otherwise.
- Calculate Turnbull WTP and Variance.
- Repeat 100 times and average WTP and Variance.

Artificial WTP from PL

	PL max
Turnbull WTP	231
[95% CI]	[205; 257]
Unrestricted WTP	259

H2 is supported: WTP_{DM} is not stat. different from WTP_{DM} with $p < 0.05$ (two-tailed)

Practical implications

Take Home Message: WTP from DM referendum equals max. WTP in two-sided Payment Ladder.

- The lower bound Turnbull WTP from a DC referendum type format, that allows to reject the offered bid amount and simultaneously express support for a given project, represents an upper limit of a WTP range subjects consider to be willing to pay.
- The presentation of a list of possible WTP values does not cause strategic behavior which biases WTP differently from a DC referendum style question in which the problem of yea-saying is specifically addressed.
- Thus strategic incentives are similar in both formats.
- And therefore: If subjects do not lie or make use of the strategic incentive to underbid in a CV exercise, the payment ladder and the DM referendum should be preferred over the DC referendum.