STATUS QUO BIAS AND CONSUMERS' WILLINGNESS TO PAY FOR GREEN ELECTRICITY: A DISCRETE CHOICE EXPERIMENT WITH REAL ECONOMIC INCENTIVES

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Overview

There are several instruments to promote green electricity: the taxation of non-renewable resources, sudsidies to green producers or letting consumers reveal their preferences by paying a price mark-up for green electricity on liberalized markets. A bulk of economic literature addresses the question on how to best transform collective environmental objectives into individual behaviour and how the cost of improving environmental quality should be shared. Studies of individual preferences for green electricity focusing on the willingness to pay (subsequently: WTP) are relevant for policy measures to stimulate consumer awareness and consumption of green electricity, and marketing activities of utilities promoting green electricity products.

Focussing on the method of discrete choice experiments (subsequently: DCE), a number of studies report a positive WTP for green electricity (Kaenzig et al., 2013). However, in spite of the WTP for green electricity, preferences for green energy are converted into purchase behaviour only to a low degree.

The economic literature discusses numerous explanations for the gap between WTP measured with stated preference methods and real market behaviour. One argument lies in the hypothesis that the change of electricity contract incurs less tangible costs that exceed the benefits offered by green electricity. These costs lead to the omission of contract change and the prevelance of existing contracts, a phenomena labelled status quo bias (Samuelson and Zeckhauser, 1988). However, although this effect is well explored in experimental economics, it has not been accounted for in existing DCE studies that elicit contract change behaviour by assuming rational evaluation of alternatives offered. Another argument states that WTP estimates for green electricity in DCE studies are significantly distorted because of an inherent hypothetical bias. In choice experiments subjects evaluate alternatives without monetary incentives. It may thus be argued that the gap between measured WTP and observed market behaviour is due to an overestimation of WTP that results from the absence of resource restrictions or budget constraints.

This study seeks to validate both of these arguments on behalf of a modified DCE. First, our experimental approach allows for an empirical estimation of the status quo bias on the WTP for green electricity. We incorporate a clear reference situation to decision scenarios of the experimental design, which make switching costs more tangible. Seond the hypothetical bias of existing DCE studies is addressed by adding an incentive mechanism which induces monetary consequences for subjects corresponding to one of their choices in the experiment.

Thus the central question of this study is whether the framing of an alternative in repeated incentivised decision situations – whether it is in the status quo position or not – will significantly affect the likelihood of its being chosen.

Methods

Our modified DCE approach draws upon Lancaster's economic theory of value and random utility theory which serves as a widely used theoretical framework for preference elicitation methods (McFadden, 1973; Lancaster 1966). In this study, consumer utility is assumed to be influenced by the attributes "cost per month", "share of renewable energy" and "location of energy generation" (Kaenzig et al., 2013). Consumers give insights into their preferences by choosing one alternative from a set of energy contracts in 12 choice tasks with varying attribute level combinations.

To make the decision process more realistic a budget constraint is implemented so that different financial payouts are possible, depending on whether higher or lower energy prices are chosen. In order to not solely overincentivise the cost attribute respondents are given the chance to contribute a donation for the two other attributes respectively. Using a random lottery incentive system participants are told that there is a 10% chance that one of the 12 choice tasks is randomly chosen and becomes binding (Menges et al. 2005). Data is used to estimate part worth utilities for each attribute. Respondents' WTP is calculated dividing the difference in part worth utilities for the levels of other attributes by the cost attribute. With the purpose of introducing a status quo alternative one contract with is details in each choice task is presented in a default position as participant's current energy contract. The status quo option is

determined with respect to a certain attribute according to a lexicographic rule. Hence, the status quo alternative might be the cheapest, the most renewable or the most regional alternative in each choice task. Status quo bias is investigated by analysing choice frequencies between treatments with and without status quo (between subject analysis).

The classroom experiment is fully computerized. The experimental design includes a basic treatment, where stimuli are offered without any status quo alternatives in default positions. The status quo treatments induce framing effects: On the one hand they include the same set of stimuli, but on the other hand they entail certain alternatives in a default position. Subjects are assigned to treatments at random giving rise to a minimum of 25 independent observations per treatment.

Results

The experiment was conducted in February 2016 at Clausthal University of Technology. 101 participants, mostly students, were assigned randomly to one of the four treatments. While holding constant the set of choice alternatives participants were either placed in an hypothetical setting with or without a status quo (Treatment 1 and 2) or a non-hypothetical setting with or without a status quo (Treatment 3 and 4).

As far as we know, this is the first study that tests whether the framing of an alternative in repeated incentivised decision scenarios significantly affects the likelihood of its being chosen. Initial results show there are no significant differences between the part worth utilities for each attribute level in the status quo and the basic treatment. These findings confirm when looking at the count ananlysis on how many times the status quo option has been chosen by the subject. Although results seem to show no significant differences at first, looking at the part worth utilities and the number of times status quo has been chosen there appears to be a small tendency towards chosing the status quo. These tendencies appear to be stronger in the hypothetical setting. As there are only around twenty five observations for each treatment and the status quo was in all cases the cheapest contract there might to emerge significant diffences by changing the status quo to the most renewable option or by increasing the number of participants.

Looking at the WTP for both the hypothetical and the non hypothetical treatment the differences are also not significant. These results are consistent with Carlsson and Martinsson (2001). Two effects can be observed. While the WTP for the attribute “share of renewable energy” decreases between the non hypothetical treatment and the hypothetical treatment, the WTP for the attribute “location of energy generation” increases.

Conclusions

The approach modifies the methodology of discrete choice experiments through an incentive mechanism. A status quo option is included in decision making to increase the external validity of results. The results contribute to the analysis of WTP in the green electricity markets, removing the often remarked upon hypothetical bias. The confirmation of a status-quo bias in utility choice is meaningful. While utilities may use this insight to alter their defaults products in order to increase the share of green electricity in the electricity mix, the ethics of instrumentalizing biases of human decision making to increase market shares of more expensive products need to be addressed. The same holds true for government policies referred to as “libertarian paternalism”.

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