

Information Effects on Consumer Willingness to Pay for Electricity Attributes

Elcin Akcura, Electricity Policy Research Group, Faculty of Economics, University of Cambridge
And European Bank for Reconstruction and Development (EBRD)

Phone: (44)07708899764

E-mail: akcurae@ebrd.com

Overview

The role of information in consumers' decision making process is a rich area of research especially with regards to market goods. Less attention has been paid to information effects in consumers' valuation of non-market goods. Understanding how information can affect consumers is particularly pertinent to the electricity sector in the UK which is undergoing fundamental changes that will have implications on both service levels and prices. Consumers are key stakeholders in the shifts in the electricity generation fuel mixture as well as to changes in the security of supply. In this context it is essential to assess whether providing the public with information can affect the support for these policies.

This paper applies the contingent valuation method (CVM) to investigate information effects in the valuation of electricity and water attributes through two self-designed surveys. Specifically, the paper analyses two caveats of information effects: the motivation of the respondent to analyse the information provided and whether the quantity as well as complexity of information leads to information overload.

Firstly, the relevance of the service attribute and its effect on information processing is explored with application to electricity and water service disruptions. The respondent's past experience of service disruption is used as a measure of relevance of the attribute. The hypothesis of the paper is that the personal relevance of the utility service disruption to the respondent affects their motivation to process the information provided in the survey. Water service disruptions are likely to be less relevant to respondents than electricity disruptions since water service disruptions occur less often than blackouts in the UK. It is thus expected that information provided in the survey will lead to a higher willingness to pay (WTP) for avoidance of blackouts than water disruptions.

Secondly, the paper investigates whether the quantity and complexity of information places a cognitive burden on the respondents by analysing UK households' WTP a premium to achieve a lower carbon fuel mixture for electricity generation. The socio-economic, behavioural and attitudinal characteristics that affect willingness to pay are also examined.

Methods

In order to address these research questions, two surveys were conducted online covering England, Scotland and Wales. The first survey was administered in 2006 and the second survey was conducted in 2008. Each survey has a sample size of 2000 respondents. For both surveys, half the survey sample was presented with information on the attribute in question before being asked their valuations, while the other half was asked for their valuation without the information card.

In the 2006 survey each respondent was presented with a table listing the UK's 2006 fuel mixture for electricity generation. The respondents were then asked to fill out a similar table to create their ideal electricity generation fuel mixture. Prior to this half the sample was presented with a textual script designed to portray a balanced view of the main advantages and limitations of each fuel type. The respondents were then asked their WTP for their ideal electricity generation fuel mixture.

The 2008 survey was designed to elicit willingness to pay for avoidance of electricity and water service disruptions. Similar to the 2006 survey, prior to answering the willingness to pay questions half the sample was provided with a short paragraph of information on the potential reasons and uses of the premium to ensure security of supply.

One of the potential difficulties in modeling WTP responses obtained from CVM surveys is that the distribution of stated WTP tends to be multi-modal and in most cases has a spike at zero. Conventional models that are applied to estimate WTP, such as ordered logit or probit, ignore this potential multi-modality in the dataset which can lead to bias and inconsistent estimates.

There is a high propensity for zero WTP responses in both the 2006 and 2008 surveys. In order to take into account of the excess zeros, I utilize the zero-inflated ordered probit (ZIOP) model proposed by Harris and Zhao (2007). The ZIOP model allows the consideration of the factors that affect zero WTP separately from the factors that affect positive WTP. This is a particularly important consideration in WTP studies because the factors that influence a respondents to state a zero WTP are likely to be different from those stating a positive amount of WTP.

Results

The main hypothesis of this paper is that the personal relevance of the utility service attribute to the respondent affects their motivation to process the information provided in the survey. The relevance of the electricity and water disruptions can be measured by the number of disruptions experienced by the respondent prior to the survey. The higher the number of disruptions, the higher is the likelihood that the issue of service disruption will be more relevant to the respondent which will have an impact on their motivation to process the information presented in the survey.

Over half of the 2008 survey sample reported experiencing a blackout, in contrast to less than 25 per cent of the sample experienced a water disruption. Electricity shortages can then be considered to be more relevant to the respondents than water disruptions. As a consequence, the ex-ante expectation is for information effects to be observed for electricity disruptions but not for water disruptions. This hypothesis is supported by the regression results. The information provided in the survey has a positive and significant effect on willingness to pay for avoidance of blackouts but it is insignificant for willingness to pay for avoidance of water service disruptions.

The content and quantity of information can also affect respondent valuations. If the volume of information presented in the survey is too large or cognitively demanding it can lead respondents to disregard the information completely, in which case there will be no differences in WTP for a group provided with the information and the control group. The results from the EPRG 2006 survey provide evidence of information overload.

Conclusions

Utilizing data from two surveys, this paper finds evidence that information affects WTP only if the service attribute in question has personal relevance to the respondent. The results from the EPRG 2006 survey also indicate that the quantity of information presented to the respondents has an effect. If the information is cognitively demanding then it can lead to information overload and result in the information being ignored. These findings suggest that information presented should not be too cognitively challenging and is likely to matter only if the public already have had some experience with the issue.

References

Harris, M.N. and X. Zhao (2007), "A Zero-inflated Ordered Probit Model, with an Application to Modelling Tobacco Consumption," *Journal of Econometrics*, 141, 1073-1099.