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AAEA, CAES, & WAEA Joint Annual Meeting, Pitsburgh, Pennsylvania, July 24-26, 2011

1. INTRODUCTION

In experimental auctions, researchers interested in eliciting people's valuation for a new product or product attribute routinely endow subjects with a conventional good and ask them their willingness to pay (WTP) to exchange the endowed conventional good with an upgraded good with the attribute of interest.

The initial endowment can introduce a bias in the form of endowment effect, consistent with loss aversion effects gained from Kahneman and Tversky's (1979) prospect theory which implied that people value a good more if it is already in their possession.

Corrigan and Rousu (2006) found that endowing subjects with a good significantly affects WTP values even in the absence of loss aversion. They postulated two possible explanations: top dog effect (i.e., subjects derive some utility from being declared the winner or top dog) and reciprocal obligation effect (i.e., participants want to repay the experimenter for endowing them with the product).

The studies that evaluated initial endowment effects in experimental auctions used single unit auction mechanisms. While these are useful, it is generally not known if these effects are present in multi-unit auction settings.

In multi-unit auctions, multiple units of the same product are auctioned and the bidder(s) can bid for more than one unit (Krishna 2002). The use of multi-unit auctions allows the derivation of demand curve for the product being auctioned for each individual and the market. Hence, demand elasticities and consumer surplus measures can be derived, which can then be used, among others, in evaluating consumer demand and welfare implications of policy interventions

2. OBJECTIVE

Assessing the sensitivity of multi-unit auctions to the endowment effect and determining which experimental approach (i.e., endow-upgrade vs. full bidding) practitioners should employ when using multi-unit auctions to estimate consumers' WTP for multiple units of a product.

3. EXPERIMENTAL DESIGN

Endow-upgrade experiment

Sample: 80 subjects were randomly drawn from a list of people who are responsible for food shopping in their household.

Product: 6 identical units of organic milk (1 liter/unit).

Endowment: 6 identical units of conventional milk (1 liter/unit).

Participation fees: 10€

Software: Z-Tree, collects bids and determines the winner(s) and the clearing price

Step1: Welcoming participants and give them their participation fee, their identification number and a questionnaire. We then asked participants to complete the questionnaire.

Step2: Explaining how the specific auction works carrying out a training session.

Step3: Each participant had to submit, through the computer, how much she/he was willing to pay to exchange each item of their conventional milk with a unit of organic milk. We provided subjects a reference price of 0.90€ for the conventional milk. Once all participants finished reporting their bids, the software determined the winner(s) and the clearing price. Then the experiment ended by handing the product to the winner(s) who had to pay the corresponding market-clearing price.

Full bidding experiment

Sample: 90 subjects were randomly drawn from a list of people who are responsible for food shopping in their household.

Product: 6 identical units of organic milk (1 liter/unit).

Endowment: NO

Participation fees: 15€

Software: Z-Tree, collects bids and determines the winner(s) and the clearing price

Steps: We conducted the full bidding experiment using the same three steps as in the endow-upgrade experiment, except that subjects were asked to report their WTP for the organic milk items rather than their marginal WTP to exchange conventional milk with organic milk. Similar to the first experiment, we provided subjects a reference price of 0.90€ for the conventional milk. Therefore, the price premium they are willing to pay for the organic attribute is computed by subtracting 0.90€ from their WTP for the organic milk.

4. RESULTS

Figure 1: Mean of the Price Premium for the Organic Attribute Obtained in Endow-upgrade and the Full Bidding Experiment

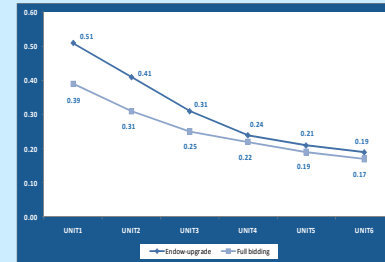


Table 1: Results from the estimation of six Tobit models

VARIABLES	MODEL1 UNIT1	MODEL2 UNIT2	MODEL3 UNIT3	MODEL4 UNIT4	MODEL5 UNIT5	MODEL6 UNIT6
CONSTANT	0.437***	0.270	0.194	0.074	-0.015	-0.064
ENDOWMENT	0.179***	0.160**	0.128*	0.121	0.142	0.142
WEEKLY	0.072	0.105	0.054	0.017	-0.034	-0.050
QUANTITY	-0.015	-0.009	-0.010	-0.016	-0.012	-0.010
HOUSEHOLD	0.048	0.051	0.006	0.102	0.124	0.117
GENDER	0.056	0.107	0.138*	0.145*	0.154*	0.153*
AGE	0.000	-0.001	0.000	0.001	0.000	0.000
CHILDREN	-0.153**	-0.150**	-0.213**	-0.239***	-0.209**	-0.220**
INCOME	-0.113	-0.058	0.015	0.007	0.060	0.080
Loglikelihood	-105.35	-107.37	-106.66	-111.87	-110.00	-110.00
Wald chi2	15.90	13.76	15.76	13.19	13.19	11.79
Prob > chi2	0.04	0.08	0.04	0.05	0.16	0.16

***, **, * Statistically significant at 5% and 10% level

Table 3: Difference in Premium Prices Obtained from Endow-upgrade Experiment and Full Bidding Experiment: Buyers of Different Units by Auctioned Unit

	Buyers 1 unit	Buyers 2 units	Buyers 3 units	Buyers 4 units	Buyers 5 units	Buyers 6 units
UNIT1	0.13	0.19	0.10	-0.05	-0.15	-0.10
UNIT 2	-	0.21	0.12	-0.10	-0.11	-0.08
UNIT 3	-	-	0.12*	-0.14	-0.08	-0.08
UNIT 4	-	-	-	-0.21*	-0.08	-0.09*
UNIT 5	-	-	-	-	-0.05	-0.11**
UNIT 6	-	-	-	-	-	-0.11**
Number of Bidders	18	18	16	10	5	76

***, **, * Statistically significant at 5% and 10% level

To obtain the different type of buyers, we divided the subjects in the two experiments based on the number of units of organic milk they are willing to buy: buyers of one unit, buyers of two units etc. (i.e. participant is considered a buyer of a unit if for that unit s/he reported a positive premium price).

5. DISCUSSION

Results (Figure 1 and Table 1) show that The mean of price premium in the endow-upgrade experiment is higher than that obtained in the full bidding experiment but differences are only significant in the first three units.

The differences in WTP values between the endow-upgrade and the full bidding experiments tend to be insignificant as the number of units of the auctioned product increases.

In the endow-upgrade experiment, an increase in number of units that the participant is willing to buy accompanied by a proportional increase in the number of units of conventional milk that s/he is willing to give up to exchange for units of organic milk => the difference between both approaches seems to be related to the number of units that subject has to give up.

Results in Table 2 generally suggest that subjects tend to decrease their WTP as the number of units of the endow-upgrade they have to give up increases. When the number of units of the endowed product that the participant willing to give up is lower or equal to the number of remaining endowed units, the endowment effect is reversed. When the number of units of the endowed product subjects have to give up is higher than the number of remaining units, the loss aversion effect (caused by tendency of subjects to value the products more when own it) becomes high enough to counterbalance reverse endowment effect.

6. CONCLUSIONS

Since our results show sensitivity of the endow-upgrade approach to the endowment effect, it would be generally better to use the full bidding approach when eliciting consumers' willingness to pay value for multiple units of a new product or product attribute.