

## A NOTE ON INITIAL ENDOWMENT EFFECTS IN MULTI-UNIT VICKREY AUCTIONS

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### Abstract

We report the result of experiments designed to assess the effect of initial endowments on willingness to pay values elicited from multi-unit Vickrey auctions. Comparing bids from an “endow and upgrade” approach with the “full bidding” approach, we find that the direction of the endowment effect generally depends on the number of endowed units of the conventional product that subjects are willing to give up in exchange for units of the upgraded product. The endowment effect is “reverse” when the number of units that participants are willing to give up is lower or equal to the number of remaining endowed units. However, we generally find an endowment effect when the number of units a participant is willing to give up is higher than the number of remaining endowed units.

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### 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. Many of the researchers that used this approach cite the seminal paper by Shogren et al. (1994) where they used this "endow and upgrade" approach to examine possible reasons for the disparity between WTP and willingness to accept (WTA) values. Some of the studies that have used this approach include Buhr et al. (1993), Fox et al. (1995), Lusk et al. (2000), Hayes et al. (2002), Fox et al. (2002), and Alfnes and Rickertsen (2003).

While this approach has a number of advantages (e.g., related to outside market influences, option values) as discussed by Lusk and Shogren (2007) and Corrigan and Rousu (2006), the initial endowment can also 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. Lusk, et al. (2004) examined the effect of endowment by comparing differences in bids obtained from an "endow and upgrade" approach to the "full bidding" approach, where people bid on both the conventional and upgraded goods simultaneously. They found that the sign and magnitude of the endowment effect depend on the auction mechanism used. Corrigan and Rousu (2006) also examined the endowment effect by comparing the differences in subjects' WTP for one unit and two units for the same product to subjects' WTP to upgrade from one endowed unit to

another unit of the same product. Their results suggest 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).

These 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. Hence, we deviate from previous studies that used single unit auctions by examining the effect of initial endowments on value estimates from multi-unit experimental auctions. 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). Admittedly, the use of multi-unit auctions in applications related to product marketing and pricing is still rare in the agricultural economics literature. However, consumers can be interested as well in purchasing not just one but multiple units of a product. Also, due to increasing time constraints, many consumers are becoming increasingly concerned about optimizing shopping efficiency by purchasing multiple units of products to save several trips to the store. While extensively studied in the literature, the WTP values obtained from single-unit auctions are only applicable for the first unit a consumer is willing to buy. Therefore, single-unit auctions are useful if one assumes that people are interested in purchasing one unit during the auction but these auctions cannot provide information on consumers' WTP for subsequent units of the product beyond the first unit. As discussed by Akaichi et al. (2009), the use of multi-unit auctions also 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 (e.g., product taxes, price ceilings, price floors). Demand elasticity and consumer

surplus measures cannot be derived from single-unit experimental auctions since the results obtained from these auctions are only valid for a single-unit shopping scenario. Consequently, we suspect that the use of multi-unit auctions for applications related to product pricing, adoption, and policy will increase in the near future.

To our knowledge, our paper is the first to attempt to study the effect of initial endowments on values elicited from multi-unit Vickrey auctions. Specifically, we wish to examine: (1) whether endowing participants with multiple units in multi-unit auctions will generate an “endowment effect” or “reverse endowment effect”; (2) whether the sign and magnitude of the endowment effect change from one auctioned unit to another; and (3) whether the number of units that a participant is willing to buy is correlated with the sign and magnitude of the endowment effect.

## **Experimental design**

We conducted two experiments using multi-unit Vickrey auctions<sup>2</sup> of organic milk in June 2009 in Barcelona, Spain. In the first experiment (i.e., “endowment experiment”), we endowed each participant with six units of conventional milk and asked them their WTP to upgrade from the endowed product to each unit of the auctioned product (organic milk). In the second experiment (i.e., full bidding experiment), we did not endow participants with conventional milk and asked them their WTP for the auctioned products. To rule out the windfall

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<sup>2</sup> The multi-unit Vickrey auction is a generalization of the second price auction (Vickrey). In this mechanism, the winner pays an amount corresponding to the sum of the bids (excluding his or her own bids) that are displaced by his or her successful bids. However, in the uniform-price auction mechanism, all winners pay the same price which is equal to the highest rejected bid (Krishna, 2002).

effect<sup>3</sup>, which is a principal cause of the reciprocal obligation effect, we reduced the participation fee (i.e., roughly the equivalent value of 6 units of conventional milk) of the subjects in the first experiment since they were endowed with the conventional milk. Hence, while participants in the second experiment received 15€, participants in the first experiment received 10€ plus the six units of conventional milk. To mitigate “outside-market influences” (see Lusk and Shogren 2007), we also informed all participants in both experiments about the market price of the conventional milk considered in the experiment (0.90€). Therefore, in the full bidding experiment, we asked subjects to report their WTP for the organic milk knowing that the price of the conventional milk is 0.90€ while in the endowment experiment, we asked subjects their WTP to upgrade from the conventional milk to the organic milk knowing that the price of the endowed milk is 0.90€/unit.

### **First Experiment**

Eighty randomly selected subjects participated in our first experiment. These subjects were randomly assigned to 8 sessions with 10 participants per session. The auctioned product was six identical items of organic milk. The experiment was performed in a room equipped with ten computers. We used the z-tree software (Fischbacher, 2007) to collect bids and to determine the winner and the clearing price. Participants also had to complete a questionnaire eliciting socio-demographic and economic information.

The experiment was performed in four steps. In step 1, each subject sat in a table separated from the rest to minimize any possible interactions and allow anonymous bidding. After taking a seat, each participant received an envelope which contained 10 Euros as compensation for their participation, his or her identification number (to be held in secret during

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<sup>3</sup> Participants endowed with a product may feel somewhat wealthier and try to be kind to the experimenter by bidding high values for the auctioned product

the process) and a questionnaire. We also endowed participants with six items of one-liter conventional milk (with the same brand and fat content as organic milk being auctioned). To avoid brand effects, we covered all the milk items with white paper. We then asked participants to complete the questionnaire.

In step 2, once the questionnaire was completed, the actual experiment began. One of the main determinants of success in experimental auctions is a good understanding by the participants of the operating procedures used in the auction mechanism. To achieve this goal, we gave each participant a printed material that included an explanation of how the specific auction works and some examples to illustrate the auction. After reading and discussing the instructions, participants were given the opportunity to ask questions to dissipate any doubts about the process. Finally, to permit a better understanding of the auction mechanism and a good familiarity with the software, we carried out a training session, auctioning six identical items of organic milk<sup>4</sup> and informed participants that no actual economic exchange will take place at the end of the training session. In this session, we asked participants to bid the amount they are willing to pay to exchange each item of their conventional milk with a unit of organic milk. We informed the participants that the only difference between the milk they already have and the product to be auctioned was the organic attribute. Once all participants reported their bids through the computer, the identification number of winner(s) and the price he/she (they) has (have) to pay are displayed in the screen of the computer.

In step 3, once the participants became familiar with the procedure, we announced the start of the real auction of organic milk. Each participant had to submit, again through the computer, how much he or she was willing-to-pay to exchange each unit of conventional milk with a unit of organic milk. Once all participants finished reporting their bids, the software

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<sup>4</sup> In Spain, milk is sold in packages of one unit, four units and six units. We chose to auction the package of six units since it is the most purchased package format

displayed whether the participant was the winner or not and the price that he/she had to pay for each unit won. The same process was repeated three more times (i.e., with three additional rounds of bidding). At the end of the fourth round, one round was chosen randomly to determine the binding round. The winner(s) in the binding round was (were) appointed as the winner(s) of the auction. Once the results were announced, the experiment ended by handing the product to the winner(s) who had to pay the corresponding market-clearing price.

## **Second Experiment**

We randomly selected 90 subjects to participate in the second experiment. Sessions were conducted in groups of 10 subjects. In this experiment, subjects were not endowed with conventional milk but received 15€ each for participating in the experiment. We conducted the second experiment using the same four steps as in the first experiment, except that subjects were asked their WTP for the organic milk items rather than their marginal WTP to exchange conventional milk with organic milk. As previously discussed, we informed subjects about the market price (0.90€) of 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.

## **Results**

Due to the complexity of multi-unit auction data and consistency of the results across all four rounds of auctions, we only report results using data obtained from the first round. Considering the whole sample, we first test the significance (t-test) of the difference between the mean of the price premium for the organic attribute obtained using the endowment method and the price premium for the organic attribute obtained using the full bidding method. We then report the results of six Tobit models designed to test the effect of initial endowment of six units

of conventional milk on subjects' valuations. We then conducted an analysis for different subsamples based on several characteristics such as the number of the auctioned product the participant is willing to buy, gender, age, income, education and presence of children in the household.

As exhibited in Figure 1, the mean of the price premium in the endowment experiment is higher than that obtained in the full bidding experiment but the differences are only significant in the first, second and the third unit. This result is also evident in the Tobit model for each unit of the auctioned product. The independent variables, consisting of a dummy variable for type of experiment/approach and other control variables, used in the Tobit models are listed and described in Table 1. As shown by the coefficients of the "endowment" variable in the Tobit models (Table 2), results for the first unit, second unit and the third unit suggest a reverse endowment effect. Corrigan and Rousu (2006) found the same results using single-unit auction and proposed the presence of "reciprocal obligation effect" (windfall effect) as a likely explanation. We take out this effect in our experiment, however, by informing participants in the endowment experiment that the units of conventional milk they received are part of their participation fee. We think that the amount of cash money that the participant has to pay if s/he is declared the winner is probably the cause of this disparity. For example, in the endowment experiment, the winner just has to pay the price premium declared as the clearing price, while in the full bidding experiment, the winner of the auctioned product has to pay the whole price. Consequently, participants who are endowed with the conventional milk may have greater incentive to pay more for the auctioned product and to buy more units of organic milk vis-à-vis the participants in the full bidding experiment.

Results above generally suggest that the differences in WTP values between the endowment and the full bidding experiments tend to become insignificant as the number of units



of the auctioned product increases. A first intuition of these results is that in the endowment experiment, an increase in the number of units that the participant is willing to buy is accompanied by a proportional increase in the number of units of conventional milk that s/he is willing to give up for units of organic milk. Consequently, the increasing effect of loss aversion seems to inhibit the incentives of participants to bid high for the first three units. To test this intuition, we separated 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, buyers of three units, buyers of four units, buyers of five units and buyers of six units. We then compared the effect of the endowment by subtracting the mean of the price premium from the full bidding experiment to the mean of the price premium from the endowment experiment for each of the subsamples and through the various units auctioned. Results in Table 3 exhibit an interesting pattern. We found that when the number of units of the endowed product that the participant is willing to give up is lower or equal to the number of remaining endowed units, the endowment effect is reverse (i.e., the difference between the premium price obtained in the endowment experiment and in the full bidding experiment is positive). However, when the number of units that the subject is willing to give up is higher than the number of remaining units, we find a positive endowment effect. This finding suggests that the endowment effect in our multi-unit auctions depends on the number of units of the endowed or conventional product that the participant is willing to give up. To further support this finding, we graph the price premiums for each auctioned unit and type of buyer in Figure 2. While the price premium for the organic milk in the full bidding experiment is weakly increasing (as we expected) in the number of units participants are willing to buy, it is generally decreasing in the endowment experiment where participants have to give up more units of the endowed conventional milk if they want to buy more units of the auctioned organic milk. While some results are not statistically significant due the low number of participants in some subsamples (e.g. buyers of 5 units), they are nonetheless significant in economic terms. For

example, the differences between the price premium in the endowment experiment and the price premium in the full bidding experiment range from 0.05€ to 0.21€, which is equivalent to a range of 12.5% to 52.5% of the mean of price premium for organic milk in the market.

We also examined if the endowment effect is related to some socio-demographic and economic characteristics of the participants (see Table 4). Our results indicate that for men subjects, there is no significant difference in terms of price premium between the endowment and the full bidding experiments. However, women subjects who participated in the endowment experiment reported significant higher price premiums for the first two units than women who participated in the full bidding experiment. We found that participants who have medium or low educational level reported higher price premium when they are not endowed than when they are endowed with the conventional milk. However, participants with high educational level bid less when they are endowed with the conventional product than when they are not endowed but the differences are only significant for the last three units. Also, we found that elder participants reported significantly higher price premium when they are endowed with the conventional milk, but younger participants (i.e., those below 50 years old) behaved similarly in the both the endowed and full bidding experiments. Participants who have children reported higher price premium when they are endowed with the conventional milk but the differences are only significant in the first three units. Finally, we found that participants with low (<1500€) and medium (1500€ to 2500€) income reported higher and significant price premium for the first three units when they are endowed with the conventional milk. Hence, our results generally show that values from subjects who are men, participants who are younger than 50 years old, participants who have high income (>2500€) and participants who have no children do not seem to exhibit endowment effects. More research is needed to determine the reasons for this finding.

## Discussion and Concluding Remarks

Endowing subjects with goods have been found in previous experimental auction studies (e.g., Lusk et al. 2004; Corrigan and Rousu 2006) to significantly influence valuations in single-unit auctions. This issue is important since questions may be raised about the accuracy and validity of the results from many valuation studies that used the “endow and upgrade” approach (Corrigan and Rousu 2006). In this paper, we further examine the effect of initial endowments in experimental auctions but instead of using single-unit auctions as in previous studies, we focus on studying the issue in a multi-unit setting using an increasingly useful valuation tool, multi-unit auctions. We suspect that the use of multi-unit auctions for applications related to product pricing, marketing, and policy will increase in the near future due to some of its advantages over single-unit auctions.

Our results are quite intriguing. Using a six-unit Vickrey auction, we found a “reverse” endowment effect in the first three units and observed that the direction of the endowment effect is related to the number of units that subjects are willing to give up. Specifically, we found a reverse endowment effect when the number of units that subjects are willing to give up is lower or equal to the number of remaining endowed units. However, we found a positive endowment effect when the number of units that subjects are willing to give up is higher than the number of remaining endowed units.

Since it is beyond the scope of the current study, future research might focus on definitively identifying the fundamental reasons behind our general findings. Our results generally suggest that in addition to loss aversion effects caused by the tendency of subjects to value the products more when they own it, our subjects also tend to decrease their WTP as the number of units of the endowed product they have to give up increases. Some researchers

have tried to take out loss aversion effects by decreasing the ownership of the endowed product. For example, Corrigan and Rousu (2006) informed their participants that they will receive the endowed good at the end of the experiment. Plott and Zeiler (2007), on the other hand, informed their subjects that it will be by pure chance (flipping a coin) that they will receive a product (i.e., either mugs or pens) and that the subjects in the next door will receive the alternative good. Hence, it might be interesting in future studies to test the effect of decreasing the ownership of the endowed products on loss aversion effects in multi-unit auctions.

## References

- Akaichi, F., Nayga, R.M., and Gil, J.M. (2009). On the Use of Multi-Unit Auctions in Measuring Consumers' Willingness to Pay for Food Products. Department of Agricultural Economics & Agribusiness, University of Arkansas. Working paper.
- Alfnes, F., and K. Rickertsen. (2003). European Consumers' Willingness to Pay for U.S. Beef in Experimental Auction Markets. *American Journal of Agricultural Economics* 85: 396–405.
- Buhr, B.L., D.J. Hayes, J.F. Shogren, and J.B. Kliebenstein. (1993). Valuing Ambiguity: The Case of Genetically Engineered Growth Enhancers. *Journal of Agricultural Resource Economics*. 18:175-84.
- Corrigan, J. (2005). Is the Experimental Auction a Dynamic Market?" *Environmental and Resource Economics* 31:35-45.
- Corrigan, J.R., and M.C. Rousu. (2006). Posted prices and bid affiliation: evidence from experimental auctions. *American Journal of Agricultural Economics* 88: 1078–1090.
- Douadia Bougherara and Pierre Combris. (2009). Eco-labelled food products: what are consumers paying for? *European Review of Agricultural Economics*, 36(3):321-341.
- Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-made Economic Experiments. *Experimental Economics* 10: 171-78.

- Fox, John A., Jason F. Shogren, Dermot J. Hayes, and James B. Kliebenstein. (1995). Experimental Auctions to Measure Willingness to Pay for Food Safety. In *Valuing Food Safety and Nutrition*, edited by Julie A. Caswell, Boulder, CO: Westview Press, 115-128.
- Fox, J.A.; D.J. Hayes, and J.F. Shogren. (2002). Consumer Preferences for Food Irradiation: How Favorable and Unfavorable Descriptions Affect Preferences for Irradiated Pork in Experimental Auctions." *Journal of Risk and Uncertainty*. 24: 75-95.
- Hayes, Dermot, John Fox, and Jason Shogren. 2002. Experts and Activists: How Information Affects the Demand for Food Irradiation, *Food Policy*, 27(2): 185-193.
- Huffman, W. E., M. Rousu, J. F. Shogren, and A. Tegene. (2007). The Effects of Prior Beliefs and Learning on Consumers' Acceptance of Genetically Modified Foods *Journal of Economic Behavior and Organization*, 63, Pages 193-206.
- Krishna, V. 2002. *Auction Theory*. Academic Press San Diego, California, USA.
- Lusk, J., Daniel, M., Mark, D. and Lusk, C. (2000). Alternative calibration and auction institutions for predicting consumer willingness-to-pay for non-genetically modified corn chips, mimeo, Mississippi State University.
- Lusk, J., J. Fox, T. Schroeder, J. Mintert, M. Koohmaraie. (2001b). In Store Valuation of Steak Tenderness. *American Journal of Agricultural Economics* 83:539-50.
- Lusk, J., T. Feldkamp, T. Schroeder. (2004). Experimental Auction Procedure: Impact On Valuation of Quality Differentiated Goods." *American Journal of Agricultural Economics* 86:389-405.
- Lusk, J.L., and J.F. Shogren. (2007). *Experimental Auctions*. Cambridge University Press. UK
- Kahneman, D., A. Tversky. (1979). Prospect Theory: An Analysis of Decision Under Risk. *Econometrica* 47:263-91.
- Plott, Charles R. and Zeiler, Kathryn. (2007). Exchange Asymmetries incorrectly interpreted as evidence of endowment effect theory and prospect theory? *American Economic Review*, 97 (4). pp. 1449-1466.
- Rousu, M. and J. Corrigan. (2008). Consumer Preferences for Fair Trade Foods: Implications for Trade Policy. *Choices*. 23 (2)
- Rozan, A., Stenger, A. and M. Willinger. (2004). Willingness to Pay for Food Safety: an Experimental Investigation of Quality Certification on Bidding Behaviour. *European Review of Agricultural Economics*, vol. 31 (4), pp 409-425.
- Shogren, J., S. Shin, D. Hayes, J. Kliebenstein. 1994. "Resolving Differences in Willingness to Pay and Willingness to Accept." *American Economic Review* 84:255- 70.

Thaler, R. (1980). Toward a Positive Theory of Consumer Choice, *Journal of Economic Behavior and Organization* 1:39-60.

Tversky, A., D. Kahneman. (1991). Loss Aversion in Riskless Choice: A Reference-Dependent Model. *Quarterly Journal of Economics* 106:1039-61.

**Table 1.** The independent variables used in the Model estimation

<b>Label of independent Variables</b>	<b>Name</b>	<b>Description</b>
Endowment	ENDOWMENT	Dummy variable that takes the value 1 if the subject participated in the endowment experiment; and 0 otherwise
Gender	GENDER	Dummy variable that takes the value 1 if the participant is male; and 0 otherwise
Age	AGE	Continuous variable: age of the participant
High education level	HIGH_EDU	Dummy variable that takes the value 1 if the participant has a high education level (university degree); and 0 otherwise.
High income	HIGH_INC	Dummy variable that takes the value 1 if the participant's income is more than 2500€/month; and 0 otherwise
Subjects who have children	CHILDREN	Dummy variable that takes the value 1 if the participant has children; and 0 otherwise

**Table 2:** Tobit models regression

	<b>MODEL1</b>	<b>MODEL2</b>	<b>MODEL3</b>	<b>MODEL4</b>	<b>MODEL5</b>	<b>MODEL6</b>
	<b>UNIT1</b>	<b>UNIT2</b>	<b>UNIT3</b>	<b>UNIT4</b>	<b>UNIT5</b>	<b>UNIT6</b>
<b>CONSTANT</b>	0.471***	0.337**	0.190	0.099	0.031	-0.033
<b>ENDOWMENT</b>	<b>0.177***</b>	<b>0.163**</b>	<b>0.125*</b>	0.098	0.122	0.118
<b>GENDER</b>	0.052	0.108	0.134*	0.135	0.146	0.14*
<b>AGE</b>	-0.001	-0.001	-0.001	0.000	-0.001	-0.001
<b>CHILDREN</b>	-0.149**	-0.136*	-0.211***	-0.215***	-0.197**	-0.207*
<b>HIGH_EDU</b>	-0.038	-0.036	0.013	-0.008	-0.070	-0.042
<b>HIGH_INC</b>	-0.111	-0.046	0.007	0.007	0.077	0.091
<b>Loglikelihood</b>	-106.41	-108.27	-107.13	-113.03	-110.82	-105.33
<b>Wald chi2</b>	13.78	11.95	14.82	11.07	10.14	11.35
<b>Prob &gt; chi2</b>	0.03	0.06	0.02	0.08	0.11	0.07

\*\*\* (\*\*) (\*) Statistically significant at 1% (5%) and (10%) level



**Table 3:** Difference in Premium Prices Obtained from Endowment 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

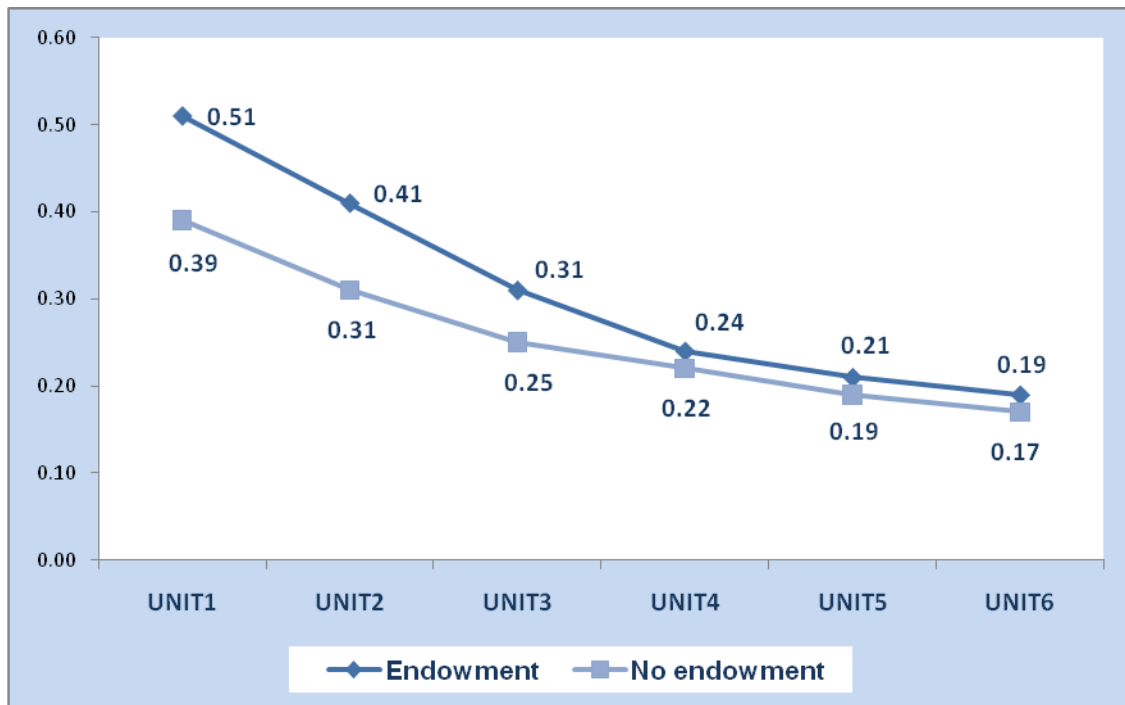
\*\*\* (\*\*) (\*) Statistically significant at 1% (5%) and (10%) level

**Table 4:** Difference in Premium Prices Obtained from Endowment Experiment and Full Bidding Experiment: Socio-Demographic Groups by Auctioned Unit.

		UNIT1	UNIT2	UNIT3	UNIT4	UNIT5	UNIT6
GENDER	MAN	0.01	-0.01	0.01	0.00	0.00	0.02
	WOMAN	<b>0.16**</b>	<b>0.14**</b>	0.06	0.02	0.02	0.00
EDUCATION	HIGH	0.07	0.06	-0.01	<b>-0.10*</b>	<b>-0.11*</b>	<b>-0.12*</b>
	MEDLOW	<b>0.14**</b>	<b>0.12**</b>	<b>0.09*</b>	<b>0.09*</b>	<b>0.09**</b>	<b>0.08**</b>
INCOME	HIGH	0.03	0.01	0.01	-0.02	-0.03	-0.03
	MEDLOW	<b>0.16**</b>	<b>0.15**</b>	<b>0.08*</b>	0.05	0.05	0.05
AGE	[18,29]	0.17	0.14	0.03	0.00	-0.01	0.04
	[30,49]	0.00	0.00	-0.01	-0.05	-0.05	-0.05
	[50,67]	<b>0.29***</b>	<b>0.25***</b>	<b>0.22***</b>	<b>0.19***</b>	<b>0.17***</b>	<b>0.14**</b>
CHILDREN	WITH	<b>0.16**</b>	<b>0.16**</b>	<b>0.10*</b>	0.07	0.04	0.04
	WITHOUT	0.08	0.05	0.03	0.00	0.02	0.02

\*\*\* (\*\*) (\*) Statistically significant at 1% (5%) and (10%) level

**Figure 1:** Mean of the price premium for the organic attribute obtained in the endowment and the full bidding experiment.



**Figure 2: Price Premiums for Each Auctioned Unit and Type of Buyer**

