



XIII
CONFERENZA

STATO O MERCATO?
Intervento pubblico e architettura dei mercati
Pavia, Università, 5 - 6 ottobre 2001

GUIDO ORTONA - FRANCESCO SCACCIATI

**ENDOWMENT EFFECT, STATUS QUO BIAS AND
CONTINGENT VALUATION**

pubblicazione internet realizzata con contributo della

COMPAGNIA
di San Paolo

Società italiana di economia pubblica

Dipartimento di economia pubblica e territoriale – Università di Pavia

Endowment effect, status quo bias and contingent valuation

Guido Ortona, Università del Piemonte Orientale, Italy and Francesco Scacciati*, Università di Torino, Italy.

*Corresponding author. francesco.scacciati@unito.it

Abstract

Results of contingent evaluation of environment goods (or bads) are strongly biased due to the endowment effects. The estimates of willingness to pay are kept low by the endowment effect for the money the subject has to pay, while estimates of willingness to accept are kept high by the endowment effect towards the asset the subject must be compensated for. It follows that the endowment effect may be partly responsible for the well-known difference between WTP and WTA. To try to assess the role of the EE, we compare contingent valuations where the WTP is asked for not losing an asset, and the WTA is asked as a substitute of a new asset. We compare the results with a control group, where we expect to find a larger difference.

Keywords: contingent valuation, willingness to pay, willingness to accept, endowment effect, status quo bias.

1. Introduction

The by now traditional willingness to accept / willingness to pay (WTA / WTP) analysis (see Cursey, Hovis and Schulze, 1987), has shown overwhelming empirical evidence that a very significant asymmetry exists between the valuations that subjects declare whether one or the other device is adopted. The problem becomes very serious, of course, when the measurements of values are necessary to solve real problems, such as judicial cases or decision making when the objects are out of market goods, such as environmental goods or more generally, public goods. Clearly, if a judge must decide for an indemnity for an environmental damage or a decision maker must decide whether to supply a public good or not (or whether to continue to supply it or not) – and the contingent valuation technique is considered a suitable instrument of measurement – it is of crucial importance whether the WTA or the WTP device is adopted. The choice of one or the other may involve a very large difference, and induce to discard instead of implementing a public project.

It may be argued that the correct choice depends on the features of the case itself. If a damage has been suffered or if the continuity of a public service that is actually supplied is in discussion, then it may seem "natural" to adopt the WTA device: something the public had has gone lost – or may be lost – and so the correct questions seem to be "How much do you value the good that you can no more enjoy?" "Which is the amount of money that would fairly compensate you for the loss you suffered or may suffer?". On the contrary, if it is in discussion whether to undertake some public project, then the WTP seems to state the correct question: "What amount of money are you willing to spend to contribute to the realisation and/or the supplying of the public good?" The answer is easy to collect, but not fully satisfying. A company convicted to pay for environmental damages could argue as iniquitous and excessive a fee widely greater than the amount the community would be willing to pay to achieve the good that has been destroyed, and, on the other hand, a policy maker could argue that a public good is worthy to be supplied even if the taxpayers declare not to be willing to pay for its full cost, just as long as there is the (almost) certainty that they will value it more once the good will be available to them.

The problem is that both the WTA and the WTP are biased and distort subjects' valuations.

The former is affected by the endowment effect (see Kahneman, Knetsch and Thaler, 1990, and, first of all, Thaler, 1980) or, in the case of goods whose availability is not exclusive, such as public goods) by the status quo bias (see Samuelson and Zeckhauser, 1988), so that subjects will very probably "overvalue" the good they lost or they are asked to give up.

The latter will probably lead to an undervaluation of the good, not because of a negative endowment effect (there is no such thing) due to the not-ownership of the good, but because of a positive endowment effect that subjects experience on their own money. This effect has been proved to be present when money (in real life markets as in an experimental one) when money is not considered a mere exchange good, i.e. when no precise decision has been taken on how to spend it, so that it is kept to buy something different from what is offered just in that spot of time and space (see Scacciati, 1998).

If we take into due account the endowment effect and the status quo bias, we may argue that the WTA / WTP asymmetry is due to the fact that both in the WTA setting and in the WTP setting, a gain is compared with a loss, while it is well known (see Kahneman and Tversky, 1979 and 1991), that the same good, or the same amount of money, is valued differently (besides the sign, of course) whether it is gained or lost.

So the way out could be to compare a gain with a gain (GG) and/or a loss with a loss (LL).

According to this hypothesis, the underlying questions are:

- a) What amount of money would you be willing to accept instead of having a free availability of the public good? This is, obviously, the GG device.
- b) What amount of money would you be willing to pay instead of losing the availability of the public good? This is the LL device.

The GG device is, by definition, devoid of endowment effect (and status quo bias): the respondent has no disposal of the public good and has none of the extra money he is offered. He is a perfect chooser and his decision should therefore not be biased at all. The GG device is suitable in the case the policy maker must decide if it is the case or not to produce or supply a public good that, at the moment, is not available. We therefore suggest to adopt the GG device instead of the WTP device.

The LL device is not as "clear" as the GG device. Here we have two endowment effects (or an endowment effect and a status quo biases) conflicting one with the other: we would have a perfectly clear response only if, by chance, they perfectly outdo one another. Unless this unlikely event occurs, the response will be biased by the difference in the endowment effect experienced by the subject on his own money and the endowment effect experienced by the subject on the asset that is, at the moment, at his disposal. In any case this bias should be rather moderate, being the result of two opposing forces. We therefore suggest to adopt the LL device instead of the WTA device.

2. The Experiment.

The experiment we ran concerned students' valuations of hypothetical increases or decreases in the number of places in the University parking area reserved to them.

Questionnaires were distributed to students of different but homogeneous classrooms and were collected the day after.

Approximately a half answered that they gave no value at all to changes in the number of parking places, so at the end we obtained 88 observations significant to our purposes¹.

Among these, 21 answered a "traditional" WTA question, 23 a "traditional" WTP question., 23 a GG question and 21 a LL question. GG subjects were asked to choose between an increase in the number of places and receiving an amount of money that would make them indifferent between the two favourable options; LL ones were asked to choose between a decrease in the number of places and paying an amount of money that would make them indifferent between the two negative options. The status quo is 124 places reserved to students. We asked two groups (WTA and LL) to imagine a decrease of the places to a half and to zero (due to the excessive costs of the good for the University) and other two groups (WTP and GG) to imagine an increase to twice as much and to 744 (stated to correspond to the "certainty" of finding a place where to park in the morning).

We expected to find:

- a) With reference to the ranking of valuations,
 - a.1) those out-coming from the WTA setting at the highest level because of the endowment effect (or the status quo bias) on the good, not constrained by any opposite force;
 - a.2) those out-coming from the WTP setting at the lowest level, because of the endowment effect on students' own money, again without constraint by any opposite force;
 - a.3) those out-coming from the GG setting surely lower than the WTA valuations and higher than the WTP valuations, due to the absence of both kinds of psychological asymmetries²;
 - a.4) as for the LL setting valuations: they are biased both by the endowment effect on one's own money and by the status quo bias due to the availability of the asset, and these two causes of distortion in valuations point to opposite directions. The overall effect depends upon which of the two effects is stronger. Consequently, the only prediction we may state is that the valuation out-coming from the LL should be intermediate between the WTA and the WTP: the valuation coming from the LL setting will be higher than the one coming from the GG setting if the endowment effect of money has a smaller effect than the status quo bias on the availability of the asset, and *viceversa*³.
- b) A smaller "kink" when moving from loss to gain in the LL-GG setting – compared to the one that occurs when moving from the WTA to the WTP settings – due to the fact that in the WTA-WTP one the endowment effect in the WTP setting and that in the WTA setting bias the answers into opposite directions, while in the LL-GG setting the endowment effect is small or absent.

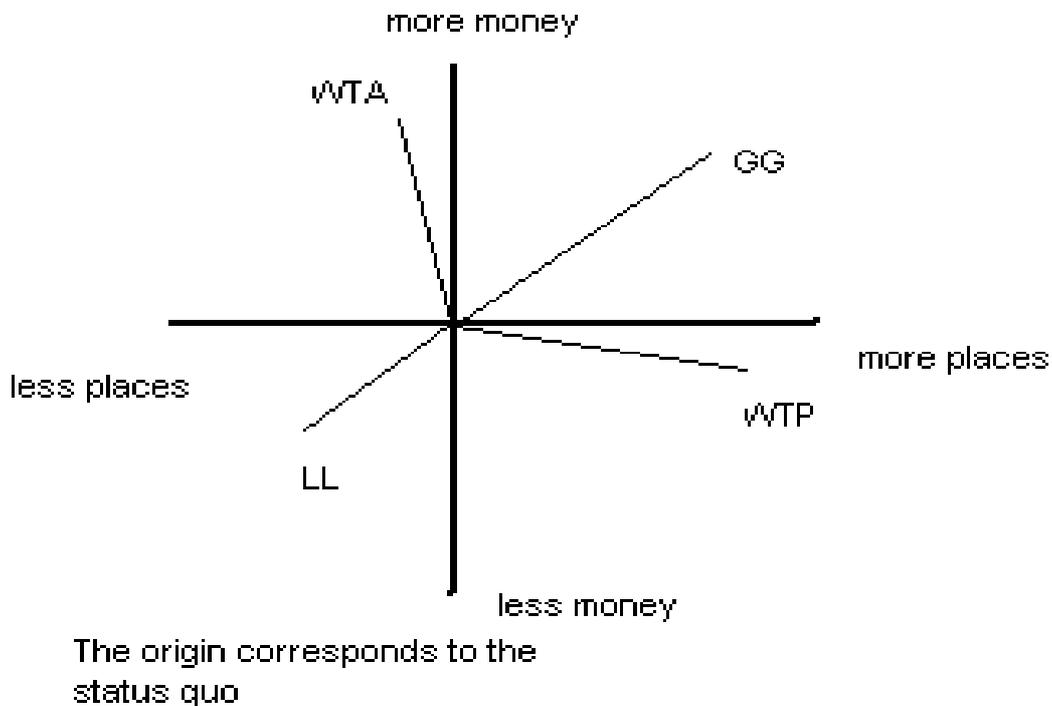
Both results may be summarised in a graph like that of figure 1.

¹ Note however that "zero" answers offer useful insights too; they will be included in further analysis.

² Obviously, if the endowment effect on one's own money were null, the valuations out-coming from the WTP setting and the GG setting would be equal.

³ Just as in the previous case, if the endowment effect on one's own money were null, then the valuations out-coming from the WTA setting and the LL setting would be equal.

Figure 1



3. Results.

Before moving to the actual results, it must be stressed that they must be considered strongly provisional, for two reasons:

- a) the sample is relatively small;
- b) due to that, we could observe only few points in the graph described in previous section, actually 7.

Due to the low number of cases, extreme value may affect excessively the means, so we considered medians instead. Results are summarised in table 1 and in graph 2, and simple observation shows that all the expectations are confirmed. More particularly:

- a) The difference between GG and WTP is strongly significant: a Kruskal-Wallis test for difference in medians is significant at more than 99% for the three changes in the number of places.
- b) The valuations coming from the LL setting are – calculated as an overall average – lower than those coming from the GG setting: this shows that the endowment effect that respondents experience on their own money is stronger than the status quo bias

on the availability of the good. Note that this *may* be due to the fact that the good is not privately owned.

- c) The difference between LL and WTA settings is less significant than that between the GG and WTP settings; the same test is significant only at 90% for the two largest changes, and is not for the smallest one. We are quite confident that this difference will prove more significant with more values and more cases.
- d) The "kink" at the origin is actually stronger in the WTA-WTP setting. This result may easily be read in table 2, that shows the slopes of the lines of figure 1 (and 2). The difference in slope between WTA and WTP lines is much greater than for the LL-GG lines, but we cannot yet provide a formal test, due to the limited number of observations.
- e) Regression analysis provide some interesting hints, albeit very provisional due again to the limited number of observations. LL and WTA bids have been interpreted as valuations, and put in the positive quadrant through standardisation of the origin of the number of places and of bids. Then two regression log-linear lines have been interpolated, one for WTA-WTP and one for LL-GG. Both interpolations are very nice; the value of r^2 is 0.935 and 0.871 respectively. The confidence intervals for the parameters show that the two lines are different. In addition, LL-GG data are quite as well interpolated by a linear equation ($r^2 = 0.856$), showing again that the kink at the origin is smaller, if any.

Table 1. Summary of the results
(loss or gain of places, median valuations in thousands of lire).

| Loss of places | | | Gain of places | | |
|----------------|-----|-----|----------------|-----|-----|
| N° | WTA | LL | N° | WTP | GG |
| 62 | 50 | 35 | 62 | 5 | 65 |
| 93 | 150 | 65 | 124 | 10 | 130 |
| 124 | 300 | 150 | 620 | 50 | 250 |

WTA > LL because of the EE due to the ownership of money

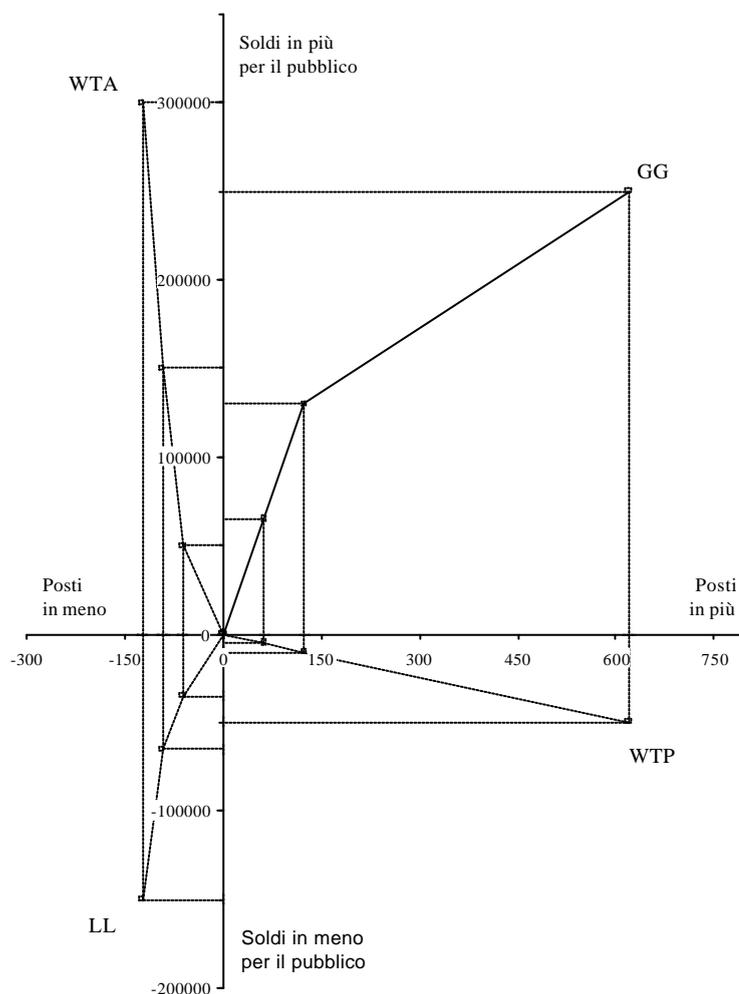
WTP < GG for the same reason

Table 2
Slope of the line connecting the bid with the origin in the *number of places-bids* space

| | WTA | WTP | WTA/WTP | LL | GG | LL/GG |
|----------------|------|------|---------|------|------|-------|
| smaller change | 413 | 80.6 | 5 | 566 | 1048 | 0.54 |
| medium change | 1613 | 80.6 | 20 | 699 | 1048 | 0.67 |
| greater change | 2419 | 80.6 | 30 | 1210 | 403 | 3.00 |

Figure 2 is the actual graph corresponding to the expected one of fig.1. They are remarkably alike; consider however that the scaling of the axes flattens (or sharpens) the plotting⁴.

Figure 2



⁴ The captions read as those of graph 1. We apologize for them being in Italian; the graph has been imported from an SPSS output file.

4. Conclusions.

We obtained two results, both quite important.

- a) It is possible to state contingent valuation questions in a way that reduces the over – or under – valuations currently supposed unavoidable.
- b) The method suggested here in one case (GG) wipes out, in the other (LL) reduces considerably, the distortions due to the status quo bias and to the endowment effect, thus allowing for the inclusion of loss and gain from the status quo in an unified behavioural pattern.

It may be stressed, however, that the experiment we run is still preliminary. We expect something more conclusive from a larger one scheduled for next Autumn.

References

- Bateman, I., A. Munro, B. Rhodes, C. Starmer, R. Sugden, 1997. A Test of the Theory of Reference - Dependent Preferences. *The quarterly Journal of Economics*, May.
- Cursey, D. L., J.L. Hovis and W. D. Schulze, 1987. The disparity between willingness to accept and willingness to pay measures of value. *The quarterly Journal of Economics*, August.
- Kahneman, D. and J. L. Knetsch, 1992. Valuing Public Goods: the Purchase of Moral Satisfaction. *Journal of Environmental Economics and Management* 22, 57-70.
- Kahneman, D., J. L. Knetsch and R. Thaler, 1990. Experimental Tests of the Endowment Effect and the Coase Theorem. *Journal of Political Economy* 98, 1325-1348.
- Kahneman, D., J. L. Knetsch and R. Thaler, 1991. The Endowment Effect, Loss Aversion and Status Quo Bias. *Journal of Economic Perspectives* 5, 193-206.
- Kahneman, D. and A. Tversky, 1979. Prospect Theory: An Analysis of Decision Under Risk". *Econometrica* 47, 263-91.
- Knetsch, J. L. and J. A. Sinden, 1984. Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value. *Quarterly Journal of Economics*, 507-521.
- Knetsch, J. L. and J. A. Sinden, 1987. The Persistence of Evaluation Disparities. *Quarterly Journal of Economics*, 691-695.
- Portney, P. R., 1994. The Contingent Valuation Debate: Why Economists Should Care", *Journal of Economic Perspectives* 8, 3-17.
- Scacciati, F, 1998. "Evaluation asymétrique: la différence entre gains espérés importe-t-elle?" In: C. Roland-Lévy and P. Adair (eds.), *Psychologie Economique – Théories et Applications*, Economica, Paris.
- Samuelson, W. and R. Zeckhauser, 1988. Status Quo Bias in Decision Making. *Journal of Risk and Uncertainty*, 7-59.
- Thaler, R., 1980. Toward a Positive Theory of Consumer Choice. *Journal of Economic behaviour and Organisation*, 39-60.
- Tversky, A. and D. Kahneman, 1991. Loss aversion and Riskless Choice: A Reference Dependent Model. *Quarterly Journal of Economics*, 1991.