PENNIES FROM HEAVEN? A TEST OF THE SOCIAL BUDGET CONSTRAINT IN A WILLINGNESS TO ACCEPT COMPENSATION ELICITATION FORMAT

ERKKI MÄNTYMAA[*]

ABSTRACT

The paper analyses the effect of a social budged constraint on compensation claims in a contingent valuation (CV) survey with a willingness to accept (WTA) format. One starting point of the work is that the CV literature generally recommends to use the willingness to pay question rather than the WTA format. Being based on a deficient realisation of WTA surveys, such recommendations ignore the significance of the social budget constraint in WTA hypothetical markets. The experiment showed clearly that explicit mention of a social budget constraint in the WTA question format has a significant effect on the compensations claimed.
Keywords: Contingent valuation, right of common access, social budget constraint, willingness to accept compensation.

~

INTRODUCTION

In principle, the essential question entailed in the contingent valuation (CV or CVM) method can be stated in two forms. On the one hand, one can ask how much, at most, an individual is willing to pay to generate an increase in the quality of an environmental resource or to avoid a decrease in its quality. The answer then contains information on the person's willingness to pay (WTP). On the other hand, it is possible to ask how much, at least, an individual should be paid if that environmental quality decreases or does not increase. The reply is then an indication of willingness to accept compensation (WTA).

The conventional welfare theory developed for the case of price change by Willig (1976) and applied to that of quantity or quality change by Randall & Stoll (1980) suggests that the two welfare measures should be almost equal

---

[*] Erkki Mäntymaa, University of Oulu, Department of Economics, P.O.Box 4600, FIN-90401 Oulu, FINLAND. E-mail: Erkki.Mantymaa@oulu.fi

so long as the income and welfare effects are small. Therefore, the value of a commodity should be equal both in purchasing and selling. One problem in practice is that several empirical and experimental studies (e.g. Bishop & Heberlein, 1979; Rowe *et al.*, 1980; Bishop *et al.*, 1983; Knetsch & Sinden, 1984; Bishop & Heberlein, 1986; Brookshire & Coursey, 1987; Coursey *et al.*, 1987; Boyce *et al.*, 1992; Adamowicz *et al.*, 1993 and Shogren *et al.*, 1994) have shown frequent substantial differences between WTP and WTA measures.

As a consequence of these observations, much research has been devoted to finding out why the WTP and WTA results differ from each other. Summarizing the literature, Hoevenagel (1994, 67–69) found five attempts to explain the difference (see also Gregory, 1986 and Mitchell & Carson, 1989, 30–38). First, the reason may be that people do not accept the property rights assumed by the researcher. Secondly, the distinctions can be explained by the "prospect theory", stating that a value function is steeper for losses than for gains. Thirdly, some environmental commodities can be part of peoples' identity, which is not for sale at any price. Fourthly, the difference may be a consequence of respondents' uncertainty or lack of time or experience. Finally, inequality between WTP and WTA can arise from the uniqueness of an environmental commodity. Connected with the last explanation, Hanemann (1991) shows analytically that, with a constant income effect, a small number of substitutes will increase the difference between WTP and WTA[1].

Nevertheless, many authoritative scientists have abandoned the use of the WTA question. In their "reference operating conditions", Cummings *et al.* (1986, 102–109) advise the use of WTP measures instead the WTA ones. The NOAA panel states in its "guidelines for value elicitation surveys" (Arrow *et al.*, 1993, 4608, 4612) that: "The willingness to pay format should be used instead of the compensation required because the former is the conservative choice." The authors nevertheless forget com-

---

[1] Adamowicz *et al.* (1993) and Shogren *et al.* (1994) test the argument of Hanemann (1991) experimentally. For an empirical test see Mäntymaa (1997, 107-121 and 1998).

modities over which people have a usufruct, even some kind of property right. If such a commodity is contaminated or its use is prevented, it is perhaps illogical to ask peoples' maximum willingness to pay. It would be more natural to ask what minimum compensation would repay the loss. Thus, Cummings *et al.* (1986) and the NOAA panel (Arrow *et al.*, 1993) are recommending the use of WTP even in cases where WTA is conceptually the right means of valuation (Harrison, 1993).

In light of Hanemann's (1991) result, a conservative approach seems not necessarily to be a sufficient ground for selecting the question format for a CV survey: "If the public good has almost no substitutes ... WTP could equal the individual's entire income (finite), while WTA could be infinite" (Hanemann, 1991, 635–636). Here the author is referring indirectly to a matter whose effect on the results of WTA studies could have been ignored merely due to its triviality, namely the budget constraint. To quote the example given by Hanemann (1991), people are not able to pay more than their whole incomes even though their lives may be in danger, but no sum of money would be enough to compensate for the loss of one's life.

One of the main differences between the WTP and WTA questions is that in answering the former question individuals are defining the value of a commodity with respect to their own budget constraint whereas the later question does not have this relationship[2]. Instead of individuals' own budget constraint theoretically there is, of course, a social budget constraint but it is much less concrete in an empirical situation. In spite of discovering this as a fundamental reason for the difference in the results, researchers have not tried to build a budget constraint into the WTA question[3]. At least implicitly, WTA studies have assumed that the government, private firms or some other

---

[2] Whether is it "right" to use a consumer's own budget constraint as a starting point in the valuation of environmental commodities in quite a different question. Is it automatically so that the value that poor people place on the environment is low only because they have no funds to pay, even though their livelihood may be highly dependent on gathering of natural products, for example.

[3] One idea that comes very close to this, however, is a valuation or preference revealing method known as an "allocation game" that asks individuals to allocate a fixed sum of money between a specified set of alternative budget

organisations or systems will repay the loss without re-
ductions in anyone's incomes, and certainly not in those
of the beneficiaries.

If the government bears the burden of the compensa-
tions, its expenses increase, and as a consequence, taxes
have to be increased or expenses have to be cut in some
other budget categories. The government can also issue
banknotes, but inflation and the rise in interests rates will
have to be paid by someone. The crucial point is that the
money does not "come from out of blue" but someone has
to pay it. That is to say, instead of an individual budget
constraint, compensations are subject to a social budget
constraint, a constraint imposed by an institution whose
behaviour affects people's welfare.

How does the lack of a social budget constraint influ-
ence the compensation claims that are expressed? On the
one hand, one can refer to the case quoted by Hanemann
(1991) in which the substitution effect is small. The dif-
ferences between the WTP and WTA figures are then real.
On the other hand, the temptation to behave strategically
might be considerably greater within the WTA elicitation
format if this does not include a budget constraint than
with the WTP format, where the budget constraint is
"clearer". This may arise from the fact that the WTA ques-
tion asked without a social budget constraint does not
involve respondents in even a hypothetical risk that the
claim might reduce their welfare in another way. Thus the
concern of the NOAA panel (Arrow *et al.*, 1993, 4604) that
"relatively few previous applications of the CV method

---

categories (Mitchell & Carson 1989, 82-84). This procedure makes respond-
ents realize the restricted nature of a government's monetary resources, so
that spending money for one purpose limits its use for others. As examples
of this approach, Strauss & Hughes (1976) examined individual preferences
for public amenities such as schools, health care and social services as against
tax reductions in North Carolina, USA, with a survey instrument which per-
mitted respondents to make constrained, hypothetical budget allocations,
Hardie & Strand (1979) applied the method to the allocation of the budget
for the Maryland State Park Service among five potential capital improve-
ments, and Hockley & Harbour (1983) provided information on how people
would allocate a sum of money between increases in government spending
and lowering of taxes in England and Wales. Kahneman & Knetsch (1992)
also attached a question to their CVM survey about the sources of corre-
sponding reductions in other categories of spending on environmental serv-
ices for which respondents had previously been willing to pay.

have reminded respondents forcefully of the budget constraints under which all must operate" and their encouragement for additional research, "... we emphasis the urgency of studying the sensitivity of willingness to pay to the number and extent of budgetary substitutes mentioned in survey instruments" (p. 4610), relate much more to WTA research.

The purpose of this paper is to study how a social budget constraint can affect the compensation claims elicited by the WTA question format in a CV survey. The environmental benefits produced by the *right of common access* (*RCA*) are the empirical object of study. This is a traditional right which is practically the same in Finland, Norway and Sweden and has origins going back into ancient Scandinavian culture (see Bergfors, 1990; Hultkrantz & Mortazavi, 1992; Hultkrantz, 1994; Vuolle & Oittinen, 1994 and Ministry of the Environment, 1995). The right of common access allows a right to access areas of the countryside independent of who owns the property (Appendix 1). The hypothetical substitute considered here is a *right to recreation*, a possibility to walk and camp for recreation purposes in certain delimited areas (Appendix 2).

The rest of the paper is organised as follows: Section two specifies the valuation arrangement, Section three presents the design and implementation of the survey, Section four describes an outlier analysis, Section five reports on the results of the tests, and finally, Section six states the conclusions.

The Valuation Arrangement

Assuming impairment in the quality of an environmental commodity, a decrease in quantity or a total disappearance of the commodity, let the resulting change in an individual's welfare be

$$v\left(q^0, y\right) - v\left(q^1, y\right),\qquad(1)$$

where $v(\cdot)$ is an indirect utility function, q^0 the original quality of the environment, q^1 the resulting inferior quality of the environment and y the individual's income. Let the indirect compensation function $\mu(q^1; q^0, y)$ indicate the

173

level of income at which consumer welfare is as high with environmental quality q^1 as with the original environmental quality q^0, given the income y. Using this utility measure, the welfare change caused by a change in environmental quality (or quantity) can be written in the form

$$\mu\left(q^1;q^1,y^1\right) - \mu\left(q^1;q^0,y^0\right).\qquad(2)$$

Compare two cases where individuals state minimum compensation claims for a decrease in the quality of an environmental commodity. In the first case someone outside the economic system compensates the users of the environment for the welfare loss caused by the quality decrease. Thus, there is no budget constraint binding the individuals and influencing their compensation claims.

In this case, the individual's welfare change can be written in the form

$$\mu\left(q^1;q^1,y^0+c\right) - \mu\left(q^1;q^0,y^0\right),\qquad(3)$$

where c is a minimum compensation. The difference in (3) is the compensation surplus (CS), denoting an income change that will repay the utility change caused by the change in commodity quality, when the individual is on a new environmental quality level but on the old utility level. Let the compensation surplus be CS_0 when there is no budget constraint. The difference (3) can be written in the form

$$CS_0 = \left(y^0+c\right) - \mu\left(q^1;q^0,y^0\right).\qquad(4)$$

The amount of c depends on the value of the loss: if the later is finite, c also is finite and vice versa. In the case without a budget constraint, WTA questions could take forms such as

• Open-ended question: How much money, at least, would you claim as compensation for the loss of commodity q?

• Dichotomous choice question: Would you be satisfied, if you would be paid a compensation of FIM A for the loss of commodity q?

If the answer to the later or dichotomous choice question type is "Yes", the compensation offered is sufficient; if it is "No", the compensation is insufficient and the respondent is claiming higher compensation.

In the second case, the government or the public sector pays compensation for the welfare change out of tax revenues. Assuming commodity prices and private incomes independent of the environmental change let the public sector collect its revenues by taxing incomes y of individuals i with a tax rate t. Furthermore, let the government use them for public services g from which the individuals benefit and for compensations c for repaying the welfare loss caused by the change, that is

$$\sum_i t_i y_i = g - \sum_i c_i. \tag{5}$$

Let the governmental budget be balanced, i.e.

$$g^* = \sum_i t_i y_i. \tag{6}$$

The balanced budget g^* consist of realized public expenses g^r and compensations to be paid for individuals as follows:

$$g^* = g^r + \sum_i c_i. \tag{7}$$

Therefore

$$g^r = g^* - \sum_i c_i, \tag{8}$$

i.e. the more compensations the government pays out the less money it has for public services (for a more detailed analysis on the general equilibrium budget constraint, see Johansson, 1993). The welfare change for an individual is now

$$\mu\left[q^1;q^1,\left(y^0 + c\right)+\left(g - s\right)\right] - \mu\left(q^1;q^0,y^0 + g\right), \tag{9}$$

where s represents the cuts in the public expenditure required to cover the compensations[4]. The compensation surplus under this social budget constraint (CS_b) will be

---

[4] In a one person society c = s and usually g >> s while in the extreme case it is possible that g = s.

$$CS_b = \left[\left(y^0 + c \right) + (g - s) \right] - \mu \left(q^1 ; q^0, y^0 + g \right). \qquad (10)$$

The WTA question formats would now take the following forms:

• Open-ended question: How much money, at least, would you claim as compensation for the loss of commodity q if amounts corresponding to the compensation were subtracted from other government expenditure and implemented across the board?

• Dichotomous choice question: Would you be satisfied, if you would be paid a compensation of FIM A for the loss of commodity q if amounts corresponding to the compensation were subtracted from other government expenditure and implemented across the board?

The total amount of cuttings of government expenditure depend on the compensations required by all respondents being unknown for each respondent at the moment of answering.

The attachment of the social budget constraint to the WTA question changes the valuation situation decisively. The respondent no longer faces the utility solely from the viewpoint of the commodity q and the corresponding compensation, but the case also includes the public services g and their value for him or her.

The question at issue is what is the relation between CS_0 and CS_b? The individual budget constraint of each person restricts the amounts that he or she is willing to pay in the WTP format. Does the social budget constraint work in the same way in a WTA format? This situation is described in Figure 1, where compensation claims are analysed with respect to two environmental commodities. The right of common access (RCA on the horizontal axis in Figure 1), the present Finnish system of recreation possibilities, is replaced with more limited rights, and thereby a less valuable commodity, the right to recreation (R on the left vertical axis). The individual's income (Y), the social budget constraint (Y^{soc}) and compensations claimed (WTA) are described on the right vertical axis. If we seek to define Y^{soc} in this case more precisely, it is the maximum amount of money that the individual considers the
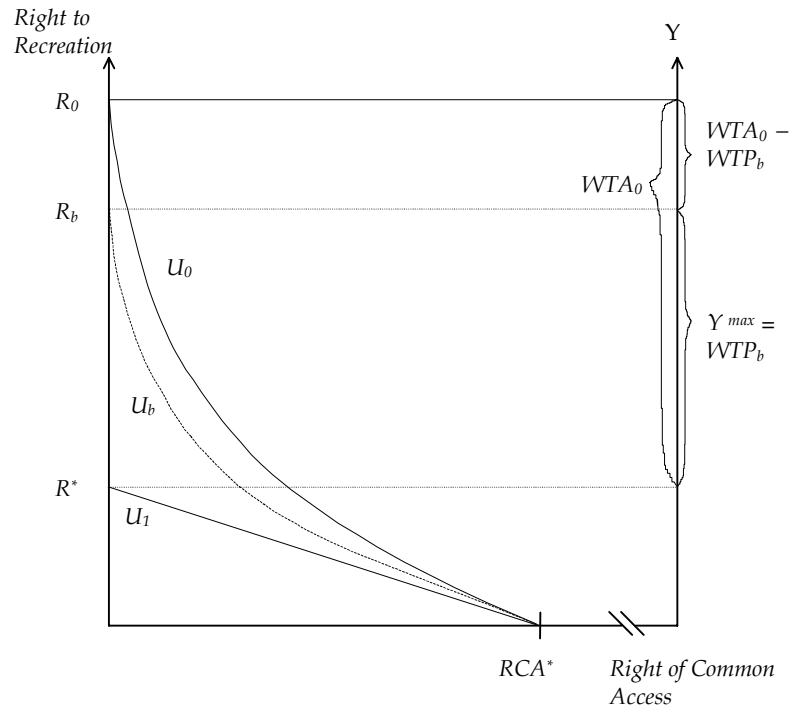
FIGURE 1. THE EFFECT OF A SOCIAL CONSTRAINT ON WTA.

government could devote to compensating for the revocation of *RCA*.

As shown analytically by Hanemann (1991) and empirically by Mäntymaa (1997, 116–119 and 1998), the substitutability between *RCA* and *R* has an effect on the resulting WTA. If the amount of *R* offered (R^*) is able to replace the present *RCA* (RCA^*) perfectly, the respondents will lie on the straight line indifference curve U_1 in Figure 1. In this case, no compensation will be claimed, i.e. WTA = 0 both with and without the social budget constraint. As the degree of substitution between *RCA* and *R* decreases, R^* is not sufficient compensation for RCA^* in the eyes of the consumer and the indifference curve moves upwards towards U_b. Consumers on U_b are ready to accept the exchange if they get larger amount of *R*, i.e. R_b, or the initial amount of *R* (R^*) supplemented with a monetary compensation WTA_b. In theory, U_b is the last curve in which Y^{soc} has no effect on WTA. In practice, however, its influence strengthens gradually before U_b.

177

In the case of U_0, individuals claim R_0 or R^* plus WTA_0 as compensation in the absence of a social budget constraint. If Y^{soc} applies, they have to settle for lesser benefits and accept WTA_b in order to avoid excessive cuts in social services. Consequently, they move to the lower indifference curve, i.e. from U_0 to U_b.

The effect of the social budget constraint on WTA is $WTA_0 - WTA_b$. Those who were given the WTA question with the social budget constraint had to take this into account and claimed only WTA_b, while those who were given the question without the constraint were free to claim WTA_0.

The theoretical analysis above suggests that the minimum compensation claim should be smaller in the case where a social budget constraint operates. But what would be the reaction of respondents to the explicit reminder of a social budget constraint in practice in the dichotomous choice WTA format? There are, of course, three possibilities. Firstly, it is possible that the social budget constraint will have no effect at all, indicating that the respondents are able to take the constraint into account even when it is not emphasized, i.e. in the WTA questionnaire without a social budget constraint. Moreover, that would mean that people do not have any illusion of free money in a WTA study and that the introduction of a budget constraint will not alter the valuation situation. This result would not give any grounds for criticising earlier WTA studies for their lack of a social budget constraint.

Secondly, the proportion of "Yes" answers may increase, which means a larger number of respondents who are satisfied with the compensation offered. People may think that very large claims for compensation would cause too large cuttings in public services, which will restrict the claims. Here the assumption is, of course, that people do not free ride in claiming compensations. This effect corresponds to the case in Figure 1.

Finally the social budget constraint may increase peoples' tendency to answer "No" to the WTA question, indicating that the money offered is not sufficient. The reason for this may be that the scenario with the explicit construction of a social budget constraint no longer includes an impairment of the environmental commodity alone but

178

implies that there will also be losses in the level of public services. That is, there is a more comprehensive, compound commodity to be valued, consisting of two simultaneous changes. If respondents follow this logic they will see two changes and claim higher compensation which means even larger losses of public services.

Although the theoretical discussion based on Figure 1 showed that $WTA_0 > WTA_b$, the discussion above suggests that it is difficult to see what would be the effect of the introduction of a social budget constraint in practice. It is therefore justifiable to construct an empirical experiment to investigate it.

SURVEY DESIGN AND IMPLEMENTATION

The data for the study were collected by dichotomous choice type postal questionnaires, sent out in summer 1995 to a random sample of 2 000 persons among the Finnish-speaking population aged 18–75 years over the whole country (except the Åland Islands). Before the main survey in spring 1995, a pilot survey was carried out with a sample of 500 in order to test different types of questions and questionnaires.

Before the valuation question itself, the questionnaire document contained a definition of citizen's rights and responsibilities under *RCA* (Appendix 1). The right to recreation, a hypothetical substitute for *RCA* in this survey, was described as the possibility to walk and camp in nature for recreation in certain delimited areas rather than general access (Appendix 2).

The introduction of the valuation questions, i.e. the WTA questions both with and without a social budget constraint, encourages respondents to imagine that the removal of *RCA* could detract from the quality of their life and that the government would compensate them for the loss in monetary terms by reducing individual taxes. Moreover, the respondents to the WTA format with a social budget constraint were told that the reductions would mean a decrease in income for the government, which would then have to be compensated for by additional cuts in expenditure implemented "across the board". The difference between the sub-samples with and without a so-

179

cial budget constraint is that the reference to the loss in governmental income was not mentioned to the latter group. The valuation question in both versions of the WTA format was the same, the dichotomous choice, suggesting a bid in the form of an annual monetary compensation for replacement of *RCA* by its hypothetical substitute, the right to recreation (Appendix 3).

The sample was divided into two sub-samples of 1 000 individuals to which the WTA question was stated in slightly different way, as described above. The bid vector was FIM 100, 200, 300, 400, 500, 600, 800, 1 000, 1 500, 5 000 and 10 000. The questionnaires elicited a total of 1 142 with one reminder, a response rate of 57.1 %. Some questionnaires failed to reach the addressee or contained protest answers. If these 32 cases are subtracted from the original sample, the final response rate rises to 58.0 %.

OUTLIER ANALYSIS

The survey asked the respondents to state their attitude towards the substitutability of *RCA* by presenting them with a hypothetical substitute for it, the right to recreation (*R*). They were thus asked how well *R* could replace the present *RCA* for them. The alternative answers were "Would replace it completely", "Would replace it well", "Would replace it satisfactorily", "Would replace it passably", "Would not replace it at all" and "Don't know" (see Appendix 2).

The dichotomous replies to the WTA question in the untreated data sets with and without a social budget constraint are presented by substitutability groups in Table 1. The examination of people's compensation claims and substitutability assessments reveals some inconsistency in the data. Although a certain proportion of the respondents indicated that *R* could replace *RCA* completely, 13 of them without the social budget constraint and 10 with the social budget constraint would not accept the given bid. Ostensibly, these respondents would not be satisfied even if they were promised a compensatory payment over and above complete replacement.

It is obvious, however, that the respondents mentioned above are not so much emphasizing the insufficiency of the compensation as indicating that they are unwilling to
180

TABLE 1. SUBSTITUTABILITY OF THE RIGHT OF COMMON ACCESS IN THE DATA WITH AND WITHOUT THE SOCIAL BUDGET CONSTRAINT.

| | WITHOUT SOCIAL BUDGET CONSTRAINT | | | | WITH SOCIAL BUDGET CONSTRAINT | | | |
| | WTA | | Row Total | | WTA | | Row Total | |
RIGHT TO RECREATION	No	Yes	abs.	%	No	Yes	abs.	%
1. Would replace RCA completely	13	13	26	4.8	10	10	20	3.4
2. Would replace RCA well	38	24	62	11.5	46	16	62	10.4
3. Would replace RCA satisfactorily	71	26	97	17.9	100	18	118	19.8
4. Would replace RCA passably	145	10	155	28.7	162	8	170	28.6
5. Would not replace RCA at all	159	3	162	29.9	169	2	171	28.7
6. Don't know	33	6	39	7.2	49	5	54	9.1
COLUMN TOTAL	459	82	541	100.0	536	59	595	100.0

accept the hypothetical arrangement of replacing *RCA* with money and *R*. Thus the respondents in both data sets who refuse to accept the compensation can be classified into two groups: "true" refusers for whom the given bid was too small, who would presumably be ready to accept a deal with a higher bid, and those who would not accept a monetary valuation of *RCA* at all, for whom no amount of compensation would be sufficient, so that they gave negative answers.

Using the results of the substitution question, the latter group of observations, i.e. the respondents who reported that *R* would replace *RCA* "completely" but did not accept the given bid, are considered to be protest responses and are deleted from the data sets. In addition, the respondents answering "Don't know" to the substitution question are left out. The two-dimensional distribution of substitutability of *RCA* and WTA in both data sets with the above protest responses, 116 observations in all, deleted, is shown in Table 2.

181

TABLE 2. SUBSTITUTABILITY OF THE RIGHT OF COMMON ACCESS IN THE DATA WITH AND WITHOUT THE SOCIAL BUDGET CONSTRAINT AFTER THE DELETION OF PROTEST RESPONSES.

| | WITHOUT SOCIAL BUDGET CONSTRAINT | | | | WITH SOCIAL BUDGET CONSTRAINT | | | |
| | WTA | | Row Total | | WTA | | Row Total | |
RIGHT TO RECREATION	No	Yes	abs.	%	No	Yes	abs.	%
1. Would replace RCA completely	0	13	13	2.7	0	10	20	1.9
2. Would replace RCA well	38	24	62	12.7	46	16	62	11.7
3. Would replace RCA satisfactorily	71	26	97	19.8	100	18	118	22.2
4. Would replace RCA passably	145	10	155	31.7	162	8	170	32.0
5. Would not replace RCA at all	159	3	162	33.1	169	2	171	32.2
COLUMN TOTAL	413	76	489	100.0	477	54	531	100.0

The "Yes" answer to the WTA question, i.e. the acceptance of compensation, is also slightly problematic if *R* is a perfect substitute for *RCA*. These respondents, especially in the data set with the social budget constraint, seem to be ready to give up an amount of public services corresponding to the monetary bid even though *R* would make up for the loss of *RCA* completely. When the compensation is to be paid in the form of tax reductions and to be funded by cuts in public services, this group is probably not interested in *RCA* as such but would be willing to reduce public services and to sacrifice *RCA* in order to reduce their own burden of taxation. These respondents were not deleted from the data, however, since the WTA question does not include a third alternative, e.g. "Don't know", which would have been more logical in this case. As the number in this group, 10 respondents, is small and their effect on the final outcome is negligible, it is unimportant whether they are or are not included in the data set.

TABLE 3. WELFARE MEASURES OF WTA WITH AND WITHOUT A BUDGET CONSTRAINT.

TYPES OF THE QUESTIONNAIRES	EXPECTED VALUE (FIM)	N
WTA without a budget constraint	19 883	489
WTA with a budget constraint	25 155	532

RESULTS

Table 3 shows that the expected WTA values are FIM 25 155 and FIM 19 883 with and without a budget constraint, respectively. This result implies that the minimum compensation claim would be larger when a social budget constraint applied. This may not be the whole truth, however, since an expected value is a very meagre indicator of the effect of the budget constraint and may be affected by the selected distribution of the statistical analysis. In order to find a more convincing result, two additional analyses will be performed below.

Firstly, Table 4 presents the distribution of the WTA responses bid by bid for each data set and shows the relative changes in "No" answers. As can be seen, the number of "No" increases markedly, by an average of 15.5 %, when the social budget constraint is included. The examination by bids shows up that the number of refusals increases in eight classes out of 11, most sharply at a bid of FIM 200, 51.9 %. At two bids, however, FIM 400 and 1 000, the number decreases and in one case, FIM 500, it remains unchanged.

The Chi-square test of the differences in all "No" answers between the data sets with and without the social budget constraint gives with $\chi^2 = 6.6105$ (critical value 3.841 at the level 0.05 with df = 1), indicating that these answers were not generated from the same distributions. Thus the tendency to reject a compensatory payment for the potential loss of *RCA* seems to increase when a social budget constraint operating through public expenditure is included in the hypothetical market arrangement.

The second additional analysis of the effect of the social budget constraint can be performed by combining the two original data sets. The following variables are included in a logistic regression model for this new data set:

TABLE 4. DISTRIBUTION OF REPLIES IN THE DATA SETS WITHOUT AND WITH THE BUDGET CONSTRAINT AND CHANGES IN THE NUMBERS OF "NO" ANSWERS (%).

	WITHOUT SOCIAL BUDGET CONSTRAINT			WITH SOCIAL BUDGET CONSTRAINT			CHANGE IN NUMBER OF THE "NO" ANSWERS
	WTA		Row	WTA		Row	
BID (FIM)	No	Yes	Total	No	Yes	Total	(%)
100	29	2	31	39	3	42	34.5 %
200	27	5	32	41	2	43	51.9 %
300	30	6	36	44	6	50	46.7 %
400	42	2	44	38	3	41	-9.5 %
500	42	5	47	42	2	44	0.0 %
600	35	2	37	43	2	45	22.9 %
800	38	6	44	47	3	50	23.7 %
1000	37	5	42	34	8	42	-8.1 %
1500	41	10	51	45	2	47	9.8 %
5000	58	24	82	64	13	77	10.3 %
10000	34	9	43	40	10	50	17.6 %
COLUMN TOTAL	413	76	489	477	54	531	15.5 %

WTA_i = willingness to accept compensation for the revoking of *RCA* in Finland, according to combined data set with and without the social budget constraint (dependent variable); if a respondent accepts the bid offered $WTA_i = 1$, otherwise $WTA_i = 0$.

BID_i = bid vector,

$BUDCONST$ = a dummy variable: if compensation is required with the social budget constraint $BUDCONST = 1$, otherwise $BUDCONST = 0$.

As can be seen in Table 5, the coefficient of $BUDCONST$ is negative (−0.4895) and significant (p value 0.0109). This suggests that the respondents having the social budget constraint in their hypothetical market had more difficulties in accepting the compensation offered. Consequently, the budget constraint, operating indirectly through the government's budget, seems to reduce the probability of accepting a bid offered in the WTA question format.

Table 5. Logistic Model for WTA in the Merged Data with and without the Social Budget Constraint.

	Logistic Model[a]	N [b]
CONSTANT	−2.0052	
	180.1062 [c]	
	0.0000 [d]	
BID	0.0001	
	20.0395	
	0.0000	
BUDCONST	−0.4895	532
	6.4787	
	0.0109	
−2LL	753.225	
Goodness of Fit	1010.023	
Model χ^2	25.060	
Sig of Model χ^2	0.0000	
N	1020	

[a] WTA = 1, if a respondent accepts the offered bid as compensation, otherwise WTA = 0.

[b] Numbers of observations in dummy categories.

[c] Wald statistic.

[d] Sig Wald.

Conclusions

The purpose of this paper is to study how a social budget constraint affects compensation claims in a CVM survey with a WTA format. One starting point for the work was that the CV literature generally recommends use of the WTP question format rather than the WTA format. Such recommendations ignore the significance of the social budget constraint in WTA hypothetical markets. The empirical part of the survey consisted of the environmental benefits produced by the right of common access, and the survey was carried out with a dichotomous choice question. A comparison was then made between the results of the two WTA questions, with and without the social budget constraint. Protest responses were eliminated from the two data sets using a filter based on the substitutability of *RCA*.

To conclude, the experiment showed clearly that explicit mention of a social budget constraint in the WTA question format has a significant effect on the compensations claimed. If the respondents followed the logic suggested in Section two, all of the three analyses conducted appeared to indicate that the constraint based on scarcity of state financial resources would increase claims for compensation for the revoking of *RCA*. Firstly, the expected WTA value with the budget constraint was found to be larger than the same value without the constraint. Moreover, the second comparison showed that the number of "No" answers tends to increase significantly due to the social budget constraint. Finally, the dummy variable indicating the existence of the social budget constraint in the combined data set received a minus sign, suggesting that inclusion of the constraint in the WTA questions reduced the probability of a given bid being accepted.

We do not know for sure, however, why it is that people reject a bid more often when faced with an explicit constraint; i.e. whether the bid is too low, meaning that people considered it inadequate as compensation for a more comprehensive impairment in environmental benefits and public services, whether it is too high considering the implied cut-backs in public services, or whether the increase in rejections is a protest, implying that people do not accept the very idea of abandoning the right of common access and using public services as compensation for it.

These alternatives demonstrate that the interpretation of the answers as presented in Section two is not the only conceivable one and may lead to the wrong conclusion in the case of some respondents. The valuation situation has changed so much that the motives for the respondents' answers should be known in order to find an unequivocal interpretation. Unfortunately the survey was defective in that sense that it did not include a follow-up question about the reason for the particular reply given to the WTA question. Without such a question it is impossible to prove explicitly what logic the respondents followed in their answers.

One additional problem with the questionnaire is that the respondents may have found a budget constraint im-

posed through cuts in public expenses vicarious and too indirect, even though people have become accustomed to the debate over the insufficiency of public funds and the need for cuts in expenditure in Finland in recent years. People may have difficulties in recognizing the possible effects of such cuts on their own welfare, however, and the fact that the distribution of taxation and social benefits differs between income and social groups might also bias the result.

The analysis indicates that the social budget constraint has a significant effect on the valuation process involved in the WTA procedure. Future investigations should analyse carefully the effects of a reminder of the social budget constraint on the valuation situation and the respondents' valuation logic when the WTA format is used. Furthermore, cases should be sought in which the social budget constraint has a more direct connection with peoples' income. Finally, the design of the social budget constraint should be improved in order to be more obvious to respondents. It might then be possible to develop a WTA question format that could be used in at least some of the cases in which it is indisputably more suitable than the WTP format.

ACKNOWLEDGEMENTS

REFERENCES

Adamowicz, W.L., Bhardwaj, V. & Macnab, B., 1993. Experiments on the Difference between Willingness to Pay and Willingness to Accept. *Land Economics*, 69, 416–427.

Arrow, K., Solow, R., Portney, P.R., Leamer, E.E., Radner, R. & Schuman, H., 1993. *Report of the NOAA Panel on Contingent Valuation*. Federal Register, 58, 4601–4614.

Bergfors, U., 1990. *Allemansrätten ur rättsekonomisk synpunkt*. Sveriges lantbruksuniversitet, Umeå, Institutionen för skogsekonomi, Arbetsrapport no. 155.

Bishop, R.C. & Heberlein, T.A., 1979. Measuring Values of Extra-Market Goods: Are Indirect Measures Biased? *American Journal of Agricultural Economics*, 61, 926–930.

187

Bishop, R.C. & Heberlein, T.A., 1986. Does Contingent Valuation Work? *In Valuing Environmental Goods: An Assessment of the Contingent Valuation Method*, edited by R.G. Cummings, D.S. Brookshire & W.D. Schulze (New Jersey: Rowman & Allanheld Publishers), pp 123–147.

Bishop, R.C., Heberlein, T.A. & Kealy M.J., 1983. Contingent Valuation of Environmental Assets: Comparisons with a Simulated Market. *Natural Resource Journal*, 23, 619–633.

Boyce, R.R., Brown, T.C., McClelland, G.H., Peterson, G.L. & Schulze, W.D., 1992. An Experimental Examination of Intrinsic Values as a Source of the WTA-WTP Disparity. *The American Economic Review*, 82, 1366–1373.

Brookshire, D.S. & Coursey, D.L., 1987. Measuring the Value of a Public Good: An Empirical Comparison of Elicitation Procedures. *The American Economic Review*, 77, 554–566.

Coursey, D.L., Hovis, J.L. & Schulze, W.D., 1987. The Disparity Between Willingness to Accept and Willingness to Pay Measures of Value. *The Quarterly Journal of Economics*, 102, 679–690.

Cummings, R.G., Brookshire, D.S. & Schulze, W.D., 1986. *Valuing Environmental Goods: An Assessment of the Contingent Valuation Method* (New Jersey: Rowman & Allanheld Publishers).

Gregory, R., 1986. Interpretation Measures of Economic Loss: Evidence from Contingent Valuation and Experimental Studies. *Journal of Environmental Economics and Management*, 13, 325–337.

Hanemann, W.M., 1991. Willingness to Pay and Willingness to Accept: How Much Can they Differ? *The American Economic Review*, 81, 635–647.

Hardie, I. & Strand, I., 1979. Measurement of Economic Benefits for Potential Public Goods. *American Journal of Agricultural Economics*, 61, 313–317.

Harrison, G.W., 1993. *General Reactions to the NOAA Report*. Reports for the CVM Network, Stockholm School of Economics, March 12, 1993, pp. 19–25.

Hockley, G.C. & Harbour, G., 1983. Revealed Preferences Between Public Expenditures and Taxation Cuts: Public Sector Choice. *Journal of Public Economics*, 22, 387–399.

Hoevenagel, R., 1994. *The Contingent Valuation Method: Scope and Validity*. Free University of Amsterdam, Doctoral dissertation.

Hultkrantz, L., 1994. Allemansrätten — hur bör den förandras? *Ekonomisk Debatt*, 22, 759–771.

Hultkrantz, L. & Mortazavi, R., 1992. *Recreation, Tourism and Property Rights to Land: The Economics of Public Access Rights in Sweden*. University of Umeå, Umeå Economic Studies no. 280.

Johansson, P.-O., 1993. *Cost-Benefit Analysis of Environmental Change* (Cambridge: Cambridge University Press).

Kahneman, D. & Knetsch, J.L., 1992. Valuing Public Goods: The Purchase of Moral Satisfaction. *Journal of Environmental Economics and Management*, 22, 57–70.

Knetsch, J.L. & Sinden, J.A., 1984. Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measures of Value. *The Quarterly Journal of Economics*, 99, 507–521.

Mäntymaa, E., 1997. *Essays on Environmental Benefits and Hypothetical Markets*. Acta Universitatis Ouluensis Oeconomica G 2.

Mäntymaa, E., 1998. Willingness to Pay and Willingness to Accept: An Empirical Test of Differences with Environmental Commodities in a CVM Field Study. *In Valuation and the Environment: Theory, Method and Practice*, edited by M. O'Connor & C.L. Spash (Cheltenham & Brookfield: Edward Elgar Publishing), forthcoming.

Ministry of the Environment, 1995. *Everyman's Right in Finland: Make the Most of the Countryside*. 1st edition. Ministry of the Environment, Helsinki, Brochure.

Mitchell, R.C. & Carson, R.T., 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method* (Washington DC.: Resources for the Future).

Randall, A. & Stoll, J.R., 1980. Consumer's Surplus in Commodity Space. *The American Economic Review*, 70, 449–455.

Rowe, R.D., d'Arge, R.C. & Brookshire, D.S., 1980. An Experiment on the Economic Value of Visibility. *Journal of Environmental Economics and Management*, 7, 1–19.

Shogren, J.F., Shin, S.Y., Hayes, D.J. & Kliebenstein, J.B., 1994. Resolving Differences in Willingness to Pay and Willingness to Accept. *The American Economic Review*, 84, 255–270.

Strauss, R.P. & Hughes, G.D., 1976. A New Approach to the Demand for Public Goods. *Journal of Public Economics*, 6, 191–204.

Vuolle, P. & Oittinen, A., 1994. *Jokamiehenoikeus: perinteistä nykypäivää* (The Right of Common Access. In Finnish). Foundation for Promotion of Physical Culture and Health, Reports of Physical Culture and Health no. 92.

Willig, R.D., 1976. Consumer's Surplus Without Apology. *The American Economic Review*, 66, 589–597.

Appendix 1

A definition of the right of common access:

The *right of common access* to the countryside denotes the right of any citizen to make use of areas that possess no buildings on them irrespective of who the owner is. The right allows us to go onto land that is not owned by us without having to ask permission from the land-owner, provided that we stay outside yards and other built-up environments.

It is usually permitted to enter areas that are in a natural state or other comparable areas on foot, on skis, by bicycle or on horseback provided that this does not cause any damage to the environment. This right does not apply to yards, fields or cultivated areas. The spending of time in one place is also permitted in the same way as moving about, for the purposes of resting, swimming or sunbathing. This means that we all have the right to use lakes and rivers for swimming, bathing and boating and for walking out onto the ice. It is also permitted to keep a boat on a shore owned by another person, provided that it is not in his yard. Common wild flowers, wild berries and mushrooms can be picked wherever one has the right to walk, and it is also permitted to camp for one or two days in such places.

This right of access always involves the obligation to avoid causing any damage, inconvenience or disturbance. This means that growing trees should not be felled or damaged, nor should dried up or fallen trees, lichen or moss be gathered from land owned by others. It is similarly forbidden to disturb or damage birds' nests or fledglings or to disturb reindeer.

It is forbidden to make a campfire or other open fire without the landowner's consent, except in an emergency. It is also forbidden to drop litter, to let dogs run unrestrained in the period 1.4.-31.8., to drive a motor vehicle without the land-owner's permission, or to hunt and fish without the necessary permits. This does not apply to traditional angling with worms as bait, which can be done without any permit or fee throughout the country apart from rapids and streams in rivers rich in corregonids and salmonids. Organised mass events such as skiing and orientation competitions require permission from the landowner(s) and cannot be arranged on the strength of this *right of common access* only.

These right and obligations are the result of a long historical process, and are characteristically not regulated precisely by law, so that compliance is rather based on tradition and common sense. The right has been part of the Nordic culture for centuries.

Appendix 2

A definition of the right to recreation, a hypothetical substitute of the right of common access, and a question of substitutability between the commodities:

The *right of common access* allows quite extensive exploitation of the natural environment even when the land or water areas concerned are

owned by other people. It is a traditional Nordic right which is only valid to this extent in Finland, Sweden and Norway. The trend elsewhere in Europe has been different, on account of the danger of causing excessive pressure on the environment because of the higher population density. Thus landowners in most parts of Europe are entitled to forbid outsiders from setting foot on their land or collecting the wild products of it.

It is possible that the recreational use of land under the *right of common access* may lead to excessive pressure on the natural environment in Finland, too, in the future, particularly in the vicinity of large population centres, and this could lead to replacement of the present common right with a right to the recreational use of certain public lands created for this purpose, partly in the existing recreational and nature conservation areas. These would probably be of three kinds: *local*, *regional* and *national recreational areas*.

The *local recreational areas* would consist of parks, forests and shores reserved for the local people for everyday outdoor recreation within their own district. They would have marked jogging and hiking paths in summer and skiing tracks in winter.

The *regional recreation areas* would be more extensive and would be located away from the major population centres, so that they would mainly be intended for weekend excursions. There would be 1-3 such areas in each province. They would contain hiking routes and sites for campfires, tents and fishing, and would be served by small tourist enterprises located nearby.

The *national recreation areas* would be very much more extensive, located in the vicinity of major natural attractions and designed to cater for tourists from other parts of Finland and from abroad. They would offer a wide range of services, including an extensive network of hiking paths and skiing tracks, areas for recreational fishing, a downhill skiing centre and various types of catering and accommodation services. Movement would be restricted or entirely prohibited in those parts of the areas which are most valuable from the point of view of nature conservation.

The greatest difference by comparison with the current *right of common access* would lie in the fact that these recreation rights would concentrate visits to the countryside mainly in carefully restricted areas, outside of which access to privately owned land and the collection of natural products would be possible only with the landowner's consent.

Please estimate how well the above recreation rights could replace the *right of common access* from your own point of view.

Completely

Well

Satisfactorily

Passably

Not at all

Cannot say

Appendix 3

WTA valuation questions with and without a social budget constraint:

The following question requires careful consideration. It is aimed at finding out the extent to which Finnish people value their *right of common access*.

The *right of common access* dates back to times when the majority of people gained their living from hunting, fishing, agriculture and forestry. Many Finnish people nowadays have a different view of nature, however, a fact which may lead to obscuring of the rights and obligations assumed in it and to increased careless behaviour by visitors to the countryside. A number of new forms of exploitation of the countryside have become popular in the last few years, e.g. cross-country cycling, horseriding, snowmobile safaris, water scooters and off-road vehicles. If indulged in thoughtlessly, these could very well cause environmental pressures and disturbances, particularly in the vicinity of major urban and tourist centres. In addition, the expansion of tourism has brought an increasing number of visitors to Finland who are unaware of the common rights and obligations prevailing in the countryside.

Reasons such as the above may lead to the placing of restrictions on the *right of common access* in the future. Imagine that there was a danger of it being replaced by a *right to recreation* in separate areas set aside for that purpose in the manner described above.

It is possible to imagine that removal of the *right of common access* could detract from the quality of your life. Let us assume that the government would compensate you for this loss in monetary terms by reducing taxes. These reductions would mean a loss of income for the government, which would then have to be compensated for by additional cuts in expenditure. Let us also assume that these cuts would be implemented "across the board".[5]

A sum of money will be suggested below. Please consider whether you regard this as sufficient **annual compensation** for replacement of the *right of common access* with the right to recreation.

Would you accept replacement of the *right of common access* with the *right to recreation* for a compensation of **FIM A a year?**

    Yes

    No

---

[5] The respondents who were required to take into account the social budget constraint in the form of the limited scope of state funds were asked the valuation question with the underlined sentence (however, without the underlining) while the sub-sample for whom the social budget constraint were not emphasised received the question without any such reminder.