

Agricultural Landscape Cultivation in Austria

An application of the CVM ¹

Gerald J. Pruckner

Summary

The purpose of this paper is to evaluate economic benefits associated with agricultural landscape-cultivating services provided as an input on behalf of the tourism sector in Austria. Applying the Contingent Valuation Method (CVM) 4600 tourists spending vacations in Austria were asked about their willingness to pay for these services in the summer of 1991. The mean and median was 9.20 ATS and 3.50 ATS per person per day, however, the values varied according to the tourists' nationality. Even though the study reveals a considerable aggregate WTP, the amount would probably not suffice to maintain farmers in mountainous regions. Various conclusions for agricultural policy can be drawn concerning direct compensation to farmers for the provision of non-market goods.

Keywords: External benefits; agricultural landscape; contingent valuation; willingness to pay; agricultural non-market goods; compensation models; agricultural policy.

1 Introduction

As in most European countries, the agricultural sector in Austria is characterised by structural change over time (Pruckner 1993). Employment in agriculture has dropped from 33 per cent of the total labour force to less than 5 per cent since World War II. The rapid growth of agricultural labour productivity caused excessive levels of farming output and subsequent dumping problems without leaving farmers better off. Furthermore, severe environmental damage is occurring due to agricultural industrialisation. These developments form the background for a future Austrian agricultural policy whose primary objective is the preservation of a productive agricultural sector in a functioning rural region. Increased attention is paid not only to market-oriented agricultural production and manufacturing, but also to the ecological compatibility of production processes.

In accordance with these goals, the political question arises as to whether or not the agricultural sector should be compensated for the provision of non-market goods. These goods comprise primarily the preservation of a typical agricultural landscape for the enjoyment of residents and tourists (Pruckner, Hofreither 1991). A scenic landscape with many environmental amenities is essential for the prosperity of Austrian tourism. Furthermore, the agricultural sector fulfills an important protective function in mountainous

¹ I would like to thank Stale Navrud, Bruce McWilliams, Art Small, the editor, and three anonymous reviewers for helpful comments.

areas. It is also the responsibility of agriculture, and especially of forestry, to protect people, animals and the whole material infrastructure from avalanches, landslides, erosion and rock slides in alpine regions.

In general, the potential for a rural area to provide countryside benefits depends on several ecological and geographical factors such as the presence of species and habitats, the area's capacity to regenerate and generate new habitat, and climatic and geomorphological conditions. Nevertheless, many landscape benefits arise as joint products of certain forms of agricultural production. Thus, the agricultural technology adopted plays a major role in the provision of landscape amenities (Hodge 1991, p. 182). To indicate the extremes, an industrialised agriculture, which has led to a reduction in the quality of the environment and values of other countryside uses, may be contrasted with extensive land cultivation that is compatible with outdoor recreation, countryside appreciation or the enjoyment of wildlife.

Agricultural non-market services represent public goods, which private markets fail to allocate optimally, and for which consumers' preferences are not directly revealed. Public intervention involving direct subsidies - based on acreage or on specific environmental activities - instead of further price support, should contribute to reducing excess production, stabilising agricultural income levels and diminishing intrasectoral income differences (see also Winters 1988; Drake 1992). Furthermore, this policy is expected to contribute towards realising ecological goals and improving the development of rural regions although the results in fact depend on the policy's specific elements.

Before asking whether and to what extent farmers should be compensated, it is necessary to measure the economic benefits associated with agricultural non-market services. There are, however, difficulties related to the valuation of these goods. The services in their entirety comprise many different components (conservation of the agricultural landscape, disaster protection, agriculture's contribution to the rural road- and trail network, management of alpine pastures, maintenance of rural culture, etc.) with the scientific measurement of some items being very difficult (Pruckner, Hofreither 1991; Hodge 1991). This paper focuses on the important aspect of landscape cultivation provided as an input on behalf of the Austrian tourism sector. The Contingent Valuation Method (CVM) is applied to measure consumer surpluses from agricultural landscape- cultivating activities.

The paper is organised as follows: Sections 2 and 3 present methodological aspects and descriptive results, both of willingness to pay (WTP), and of other questions pertaining to relations between agriculture and tourism in Austria. Section 4 reports the estimation of a censored Tobit-model to identify the most important determinants of individual WTP, and section 5 discusses aggregation of WTP-figures. Section 6 contains a short summary and conclusions for the agricultural policy within the perspective of Austria's entry into the European Union.

2 The Contingent Valuation Method

The procedure in this methodology, often used to value environmental projects, lies in the establishment of hypothetical markets for public goods not traded in private markets. Using surveys, the method aims to elicit consumers' WTP for a specific (environmental) good. To date the vast CVM literature consists of more than 1670 publications dealing both with theoretical and empirical issues (Carson et al. 1994). The following section should not be understood as a complete summary of all CVM topics.² It is rather intended to focus on those points from the literature which are especially relevant for the case study presented below: the hypothetical nature of the surveys, strategic behavior, the comparison of closed-ended and open-ended question formats, and the existence of embedding effects.

Perhaps the most important objections to CVM, comprehensively reviewed in the literature, concentrate on the hypothetical survey setting, since the procedures do not deal with actual consumer behavior. Several authors argue that biased estimates may occur due to the fact that the market valuation context as well as the commodity itself is unfamiliar to the survey participants (Kealy et al. 1988; Mitchell, Carson 1989). On the contrary, Cummings and Harrison (1994) state that they are not aware of any theory that relates the degree of familiarity with the quality of valuation processes. Based on comparisons with real experiments there is empirical evidence that hypothetical CVM bids may overstate real economic commitments even if the respondents value familiar private goods (Blackburn et al. 1994; Cummings, Harrison 1994).³

A second objection, closely related to the hypothetical nature, focuses on strategic behavior. The statement is that one cannot hope to obtain correct values of individual preferences for public goods by asking respondents directly to reveal their willingness to pay or accept. People may attempt to influence the provision of the public good and/or the payment connected with this good. Thus, the willingness to pay (accept) given by respondents will differ from their true WTP (WTA) since the individuals will behave strategically in their efforts to "snatch some selfish benefit". From a theoretical perspective, Hoehn and Randall (1987) provide a sophisticated basis to show that CV models in principle do not generate incentives to overstate true WTP and that truth telling represents the optimal strategy in a policy referendum model. Nonetheless, Cummings and Harrison (1994, p. 29) conclude that the general expectation accepted by many CVM researchers, that respondents will not engage in strategic behavior, lacks substantive foundation. This is in contrast to Mitchell and Carson (1989, p. 170) who argue that strategic bias is not a significant problem for CV studies under *most* conditions.

² For methodological surveys and a comprehensive discussion of empirical applications, see Mitchell, Carson (1989); Carson (1991); Navrud (1992); Navrud, Pruckner (1994).

³ For a recent empirical study comparing actual and hypothetical payments for the membership in the Norwegian Association for the Protection of Nature, see Seip, Strand (1992).

Another methodological topic, which is of interest for interpreting the empirical results in this paper, refers to the appropriateness of either open-ended or closed-ended (dichotomous choice) question formats.⁴ The most important arguments entered against open-ended questions - the format applied in this study - are the lack of realism and the invitation for respondents to overstate their true WTP.⁵ The former objection deals with the problem that respondents are expected to not be familiar with the good in question, and therefore not able to place an appropriate money value on the environmental good. This may be true for many applications measuring passive use values, where people do not have sufficient experience with specific environmental goods. However, due to the fact that the purpose of this study is to reveal use values, one may assume that vacationers actually using the countryside are sufficiently familiar with that good.

In fact, there are only a few studies which have examined the differences between open- and closed-ended question formats with appropriate tests. Kealy and Turner, who applied a new testing procedure, found that these two ways of asking the valuation question lead to significantly different WTP for public goods (Kealy, Turner 1993, p. 327). Nevertheless, the study also revealed that closed-ended WTP values are always higher than open-ended answers, irrespective of the specification of WTP-functions. This result is supported by empirical evidence from Walsh et al. (1989) and Kriström (1993). Therefore, we conclude that open-ended questions at least do not generate overbidding. A further result, that no WTP differences occurred in the case of a private good, should also justify the application of an open-ended format to value a good with which tourists are to a certain degree familiar.

Further criticism posing serious doubts about the validity of CV results pertains to the embedding problem. This phenomenon describes the finding in several empirical studies that WTP for an environmental good is approximately the same as WTP for a more inclusive good. Therefore, CV results have been alleged to be inconsistent with the assumptions of rational choice because significantly different values may be put on a specific good depending on whether the good in question is valued separately or on the basis of a more inclusive set of goods from which it is taken.⁶ Other caveats against the validity and interpretative meaningfulness of CV results refer to the biases which may occur with the design of questionnaires (Carson 1991; Hausman 1993).

The State of the Art and the reliability of results

⁴ In an open-ended question, people reveal their particular WTP. Answering a closed-ended version, however, respondents state whether they would be willing to pay a predetermined amount. For the theoretical foundation of dichotomous choice CV models, see Hanemann (1984).

⁵ For a comprehensive discussion of advantages of referendum formats, see Hanemann (1994).

⁶ For a comprehensive analysis of embedding effects (part-whole biases), see Kahnemann, Knetsch (1992); Smith (1992); Desvovges et al. (1993); Diamond, Hausman (1993); Fisher (1994).

The present empirical literature does not support a definite answer about the existence of potential biases. The reason for this is that the potential for various biases depends on the specific contingent valuation scenario being evaluated. Therefore, the general discussion about the reliability of CVM cannot be expected to disappear in the near future.

Apart from this overall controversy, the National Oceanic and Atmospheric Administration Panel on Contingent Valuation (NOAA-Panel) concludes in its general assessment of the CVM that the instrument is able to produce reliable results for the evaluation of environmental goods when applied carefully.⁷ For the purpose of proper application, the Panel has recently drawn up a list of guidelines for CVM surveys that should be closely adhered to in empirical work. The most important recommendations include an appropriate sample type and size, a preference for personal interviews, a conservative study design, and the application of the referendum (closed-ended) format (Arrow et al. 1993).

Even though these guidelines seem to serve as a standard for future CV applications, the Panel has also met with criticism. The most important objection is that the recommendations are not sufficiently strict. While the report says that the guidelines should be followed as closely as possible, at the same time it does not provide guidance as to which deviations could be accepted without devalidating the results (Smith 1993). To date there is no empirical study that has fully met the NOAA-Panel standard.

The empirical study presented below meets most of the guidelines recommended by the NOAA-Panel. However, the survey did not apply the referendum format, but an open-ended question.⁸ Based on the survey design, we argue that the results obtained by this study should turn out to be sufficiently reliable and conservative to provide an insight into the order of magnitude of tourists' benefits from the utilisation of the countryside for recreational purposes. Moreover, the claim that the discrepancy between hypothetical and actual circumstances should be smaller if the commodity is more important for respondents, supports the appropriateness of the empirical study in this paper, because an overwhelming majority of the sample explicitly stated the importance of countryside-related aspects.

3 The Contingent Valuation Study

⁷ The fact that CVM has been employed as an instrument to reveal preferences for many environmental goods and natural resources, especially in the U.S., demonstrates general acceptance of this methodology in various areas.

⁸ Further recommendations which are not taken into account are to remind the respondents of alternative commodities (substitution effects) and budget constraints.

More than 4000 tourists spending vacations in Austria were asked about their willingness to pay for landscape-cultivating services across the country in the summer of 1991.⁹ In addition to revealing WTP, the study also contained other questions dealing with relations between the countryside, the agricultural sector and tourism in Austria.

Countryside and tourism

As to whether a well-kept landscape was the decisive factor in spending a vacation in Austria, 84 per cent of the respondents answered "yes". This percentage was similar in most Austrian regions, only the eastern federal states showing lower values. Further responses strenghten this outcome. The respondents were asked to pick those vacation components from a list of 26 items (multiple mentioning) that they rated to be important at the vacation resort. For 88 per cent of the tourists, the component "environment and countryside" was rated highest, in preference to items such as "climate", "weather", "friendliness of residents", "quiet at the site" and "equipment of the location". These percentages confirm at least that the countryside represents an important input factor for the Austrian tourism sector. Besides other arguments, this fact should justify the attempt to value the environmental good, the allocation of which is increasingly uncertain. An individual valuation of the quality of landscape management in Austria from a regional perspective has exhibited substantial east-west differences, with higher quality found in the western federal states of Tyrol, Vorarlberg and Carinthia (Pruckner 1994a).

Landscape cultivation by farmers

Another question affords an interesting view into tourists' desire to have farmers cultivate the countryside. The respondents were asked whether the farmers or whether some other specialists should provide landscape-related services. Two-thirds of the sample voted in favour of farmers while 7 per cent expressed indifference between the two groups. However, there are significant differences in the voting patterns amongst the different nationalities of tourists. The highest preference for the supply of these services by farmers was observed by tourists from Austria (70 per cent of the respondents), followed by vacationers from Switzerland, the Netherlands and Germany. However, British and especially American respondents revealed a lower preference in favour of the agricultural sector.

If one presumes that the reliable supply of these services is indeed most easily guaranteed by the agricultural sector, the strong preference of Austrian tourists for farmers could probably be interpreted as a high awareness of interrelations between landscape preservation and agricultural production in Austria. One argument supporting this

⁹ The appendix at the end of the paper contains the relevant survey information.

interpretation is that there are few countries apart from Austria that are characterised by a comparable spatial interlocking between the agricultural sector and the whole society.

Willingness to pay figures

Methods for reducing potential biases were applied in obtaining the WTP figures of vacationers in Austria for agricultural countryside-cultivating activities. After the respondents got a verbal description of these services, they were asked with an open-ended format to state their maximum WTP (see appendix). The mean WTP per person per day was 9.20 Austrian shilling (ATS), although half of the sample was only willing to pay up to 3.50 ATS (median). The standard deviation of the distribution was 15.95, and about 43 per cent of the sample did not answer the question reliably. It turned out that the high non-response rate depends to a certain extent on the respondents' awareness (familiarity) of the agricultural services during the vacation (see appendix for an instructive discussion of the non-responses).

Table 1 contains both the means and medians of individual WTP for agricultural landscape-cultivating activities by different nationalities of tourists.¹⁰

Table 1

Analysing individual mean WTP, it turns out that the value of tourists from Austria outside Vienna is significantly higher (5 per cent level) than the mean of all other vacationers. This result coincides with the outcome of the above mentioned question concerning future landscape preserving activities. Whereas Austrian tourists revealed a strong preference for farmers, this content is now expressed by their high WTP. Vacationers from the U.S. show a high mean WTP for landscape-cultivating activities (11.50 ATS), this value does not differ significantly at the 5 per cent level from other respondents. This result is confirmed by the medians.

The median of the U.S. tourists (3.10 ATS) is not significantly different from those of other nations. On the whole, the medians of different nationalities reflect the results of the question concerning future landscape-cultivating activities. The highest values were registered by Austrian tourists and by vacationers from Switzerland. The medians of people from the U.S., the Netherlands (2.00 ATS) and Great Britain (1.75 ATS) are lower. This comparison might support the interpretation of a strong awareness of the

¹⁰ Whether the mean or median is the proper measure for aggregation purposes depends on the intention of the CV study. The median is an important measure if the allocation of public goods is based on referenda.

interrelations between agricultural production and landscape cultivation by Austrian people.¹¹

It should also be realised that recreation is not considered the only purpose of landscape-cultivating services by Austrian people. Moreover, these services also maintain the living space by ensuring protection against avalanches, landslides, erosion and rock slides. These protective effects probably find their expression in the higher WTP of respondents from Austria. In addition, it is also possible that WTP answers include some components of non-use values (existence- and bequest values) which could be supposed higher for Austrian people compared to other nationalities.¹²

4 Determinants of WTP figures

A censored Tobit-model was applied to estimate the most important determinants of individual WTP answers. Suppose wtp^* to be a WTP variable depending linearly on individuals' attributes and that is not directly observable (Maddala 1983).

$$wtp^* = \beta'x + \varepsilon ,$$

$$\text{with } \varepsilon \sim N [0, \sigma^2]$$

The observed variable wtp is censored with respect to wtp^* such that

$$wtp = wtp^* \quad \text{for } wtp^* > 0 \text{ and}$$

$$wtp = 0 \quad \text{for } wtp^* \leq 0.$$

A maximum likelihood estimation of this model has provided the results in Table 2.

Thus, wtp , INCOME, AVAGE and PROF represent individual willingness to pay, household income (divided by 1000), average age of the travel party and professional activity, respectively. The dummy variable PROF distinguishes between employed (1) (self-employed, freelance, farmer, employee or public servant) and non-employed (2) (retired, housewife or -man, student, pupil or jobless). ENVIND is an environmental indicator measuring the respondents' quality assessment of landscape cultivation, with high (1), medium (2) and low (3) quality levels. AUST is a dummy variable for Austrian residents, and STPR reflects the population of the tourists' place of residence, indicating whether there are more than 100,000 inhabitants in the vacationers' native place of residence (1).

¹¹ The differences relative to other nationalities cannot be explained by socio-economic variables (see the regression analysis below).

¹² Finally, due to financial reasons, no explicit test was undertaken to investigate the existence of embedding effects. Reference can be made to a similar study on landscape valuation by Willis and Garrod (1991) in which neither part-whole bias nor strategic bias was a serious problem.

Table 2

Most variables in Table 2 turn out to be significant at least at the 5 per cent level, and individual WTP figures are positively determined by households' income,¹³ the average age of the travel party and by the professional activity of respondents. These results coincide with other empirical studies even if the independent variables are not always exactly the same (Bergstrom et al. 1985; Willis, Garrod 1991). The coefficient of the subjectively noticeable quality of landscape management shows a negative sign. This reflects an often observed phenomenon, namely, that individual WTP for environment-improving projects will increase only if negative environmental influences are perceived immediately. That is why individual WTP figures for landscape-cultivating activities turn out to be higher if there is a need for immediate action due to a worsening condition of the countryside. That residents of big cities, who are thought to perceive environmental problems more acutely, might reveal higher WTP is supported by the positive sign of STPR. However, the variable is not significant at a sufficient level.

The significant positive influence of the Austria dummy indicates that Austrian residents in fact reveal higher WTP than respondents from other countries even when other socio-economic differences are taken into account. This result emphasizes the forementioned national appreciation of landscape-cultivating activities which might be influenced by geographical circumstances.

5 Aggregation issues

The validity of adding up individual WTP figures to obtain an aggregate welfare measure depends on several (restrictive) conditions. Economic theory shows that the aggregation of individual welfare measures is generally not independent of the distribution of income. Only the case of identical and homothetic preferences allows an unambiguous answer about potential Pareto efficiency in cost benefit analyses of environmental projects. Moreover, scaling and indexing problems may exist (Mitchell, Carson 1989, p. 42), and the relevant population, to which individual values should be aggregated, has to be chosen correctly.

Another difficulty lies in the adequate consideration of non-respondents. An extreme version assigns a WTP of zero for all non-respondents. Although this procedure avoids an overestimation of the aggregate value, one may assume that at least some of the non-respondents have a non-zero WTP whence a systematic underestimation results. The

¹³ See Seip and Strand (1992, p. 95).

variant most often applied is to eliminate non-respondents, thereby assuming that the WTP of non-respondents and respondents do not differ significantly.¹⁴

The extrapolation of WTP to all tourists in Austria during the summer season yields an aggregate value of 710 million ATS (mean) for the variant in which non-respondents are eliminated. The largest portion of this figure is allotted to the province of Tyrol, followed by Carinthia and Salzburg (Figure 1). Assuming a zero WTP for all refusers amounts to the most conservative estimate of 411 million ATS. However, this figure increases up to 454 million ATS if we more realistically assume mean WTP for those respondents who previously revealed zero, but subsequently stated that they definitely reject the question (see appendix).¹⁵

Figure 1

These results do not include any separate aggregate WTP for Austrian residents for recreational purposes or for the protection of their living space. It is clear that the WTP of the resident population will not coincide with the stated values of tourists. Due to the fact that WTP was asked on a per day basis, one may expect the residents' values to be lower when the financing is required for the whole year instead of for a short vacation period. Otherwise, the protective measures mentioned above speak for higher WTP values. Therefore, as an extension of this study, it would be necessary to carry out a separate CVM study among the resident population in Austria. For the purpose of giving an idea about an expected order of magnitude, the results of a similar Swedish study are presented below.

Drake (1992) found an average of 78 ECU per person per year for the cultivation of the Swedish agricultural landscape among the resident population. Suppose that the Austrian population would be willing to pay the same amount. This would result in an aggregate figure of about 6.6 billion ATS per year.¹⁶ There is qualitative evidence that Austrian residents give a high priority to the scenic shaping of the Austrian landscape. In the course of a study referring to the way Austrian people see themselves (Market 1992), residents were asked what they were especially proud of. The scenic landscape of Austria (71 per

¹⁴ This alternative is often criticised with the argument that the refusal of an answer alone would reveal a subaverage WTP of non-respondents.

¹⁵ If we hypothetically assume that winter- and summer tourists have the same WTP, an extension to winter tourism as well would come to approximately 1.2 billion ATS for all vacationers spending their holidays in Austria. However, there are many arguments against the assumption of identical preferences of winter- and summer tourists (Pruckner, Hofreither 1991).

¹⁶ Following Drake (1992) this rough estimate is obtained by multiplying the mean bid by the number of Austrian inhabitants between 16 and 74 years of age (5 823 000). Yet the necessary conditions to hold for a benefit transfer still being reliable (Navrud 1994) were not checked properly. To avoid double counting of Austrian residents, these values may not be added to the tourists' total WTP.

cent of respondents) was given the first priority, followed by social security aspects and the Austrian cuisine (57 per cent), as well as the political neutrality of the country (53 per cent).

6 Realisation problems and outlook

Being aware of all difficulties associated with CV surveys and aggregation processes, it seems obvious that there is a positive WTP for the provision of agricultural landscape-cultivating services. The relevance of the order of magnitude can be expressed by comparing this with actual levels of agricultural subsidies. Direct payments of central and regional governments for mountain farmers in Austria amounted to 1.34 billion ATS in 1991. The value of aggregate WTP for total tourism (1.2 million ATS) is very close to the present support of farmers in mountainous regions. However, it also becomes evident that tourists alone are not able to finance all landscape-preserving activities. Even if vacationers were forced to actually pay their total WTP, this amount would probably not suffice to maintain farmers in mountainous regions.¹⁷

Apart from the measurement of WTP, the implementation of a compensation payment scheme in practice represents a difficult subsequent task of agricultural policy. Here, various factors should be taken into account. First, efficiency conditions play a major role whenever the question of direct payments to the agricultural sector is raised.

Compensation of positive externalities

This study neither captures the benefits from all kinds of agricultural non-market services, nor considers all utility components of residents. However, apart from these facts, one cannot infer that revealed WTP figures represent the compensation payments that should be made. It can be shown in the course of a simple welfare economic analysis that there are certain requirements that have to be met to justify direct subsidies for farmers. The problem of market failure in the presence of positive externalities is only relevant if certain scarcity conditions are fulfilled; the mere existence of positive externalities does not legitimate compensation claims from a welfare economic point of view (Hackl, Pruckner 1994). However, it is difficult to check conditions of scarcity empirically since it necessitates a marginal analysis. The purpose of this paper was to estimate tourists' benefits from a free landscape use for recreation, rather than to calculate exact compensation payments.

Furthermore, there are distributional issues relating to compensation payments. It is important both to determine the persons who are forced to pay, and to establish the criterion for distribution among farmers. The objective of low administration costs and the avoidance of undesirable incentive effects also play a major role that cannot be

¹⁷ For comparable studies dealing with costs of landscape-preserving activities in Austria, see Pevetz et al. (1990).

neglected. These manifold constraints illustrate that real compensation models will probably represent "second best" solutions.

A growing recognition of the importance of landscape-cultivating services is indicated by the fact that a few tourism communities in Austria voluntarily compensate their farmers for the preservation of an agricultural countryside. These actual payments are very close to the aggregate WTP figures presented in this paper. Therefore, the values of the CV study may indeed represent a realistic order of magnitude that could be used as one basis for establishing compensation models in tourist-intensive communities (Hackl, Pruckner 1994).

International framework

Practical compensation models in Austria must also consider the international leeway. For example, the European Union has laid down measures to reduce environmental degradation and to make compensation payments for agricultural functions with public interest.¹⁸ These provisions are mandatory for EU members and can be adjusted to national and regional conditions. They aim to support agricultural market orders and to achieve environmental targets. The measures reflect an acknowledgement of the protective and recreational functions of the agricultural sector and are expected to contribute to achieving appropriate income levels for farmers (for the list of targets, see Hofreither 1993). These opportunities for encouraging environment-relevant agricultural activities constitute a framework for compensating Austrian farmers once Austria becomes an EU member state in 1995.

Prospects

Looking at the situation of federal and regional budgets in Austria and watching international developments, it becomes clear that one cannot count on a further expansion of public agricultural expenditure. That is why the regional structure of current agricultural subsidies has to be discussed with respect to the provision of non-market services. The fact that there is a substantial east-west difference in the subjectively perceived quality of landscape cultivation in Austria, raises the question of solidarity among farmers concerning a redistribution of subsidy funds between different agricultural regions.¹⁹ This aspect becomes painfully evident if one takes into account that the three Austrian federal states which were best rated with respect to landscape management (Tyrol, Vorarlberg and Carinthia), receive only 14 per cent of the overall direct and indirect agricultural support (Pruckner 1994a, p. 159).²⁰

¹⁸ European Community: "Contribution to preserve the Environment", regulation no. 2078/92.

¹⁹ The highest quality indicators were observed in the western part of Austria.

²⁰ Agricultural subsidies are distributed among nine federal states.

Finally, however, there is one more important policy-relevant aspect. If there is a claim for compensation payments for non-market goods, an analogous consideration of negative externalities will also become necessary. Policies for positive externalities from agriculture cannot be completely separated from policies for negative ones. From this perspective, the analysis in this paper remains incomplete.

Table 1: Willingness to pay in ATS per day per person by different nationalities*

Country	mean	median	standard deviation
Austria (without Vienna)	11.40	5.00	18.38
Vienna	8.90	5.00	12.32
Great Britain	8.50	1.75	15.97
Netherlands	6.40	2.00	13.48
Switzerland	9.80	5.00	14.30
Germany	9.00	3.50	15.95
USA	11.50	3.10	20.55

* 1 ATS is equivalent to 0.07 ECU or 0.09 US\$.

Table 2: Determinants of individual WTP

Dependent variable: wtp		
variable	coefficient	t-value
INCOME	0.067	3.48
AVAGE	0.059	3.06
PROF		
1	4.47	3.85
2	0	
ENVIND		
1	-7.33	-4.62
2	-7.22	-4.45
3	0	
STPR		
1	1.11	1.01
2	0	
AUST		
1	4.84	3.77
2	0	

n = 2110

Predicted probability of WTP>0 given average independent variables = 0.53

Observed frequency of WTP>0 is 0.58

Mean value of WTP given average independent variables:²¹ E(WTP) = 9.75

²¹ Maddala (1983, p. 159).

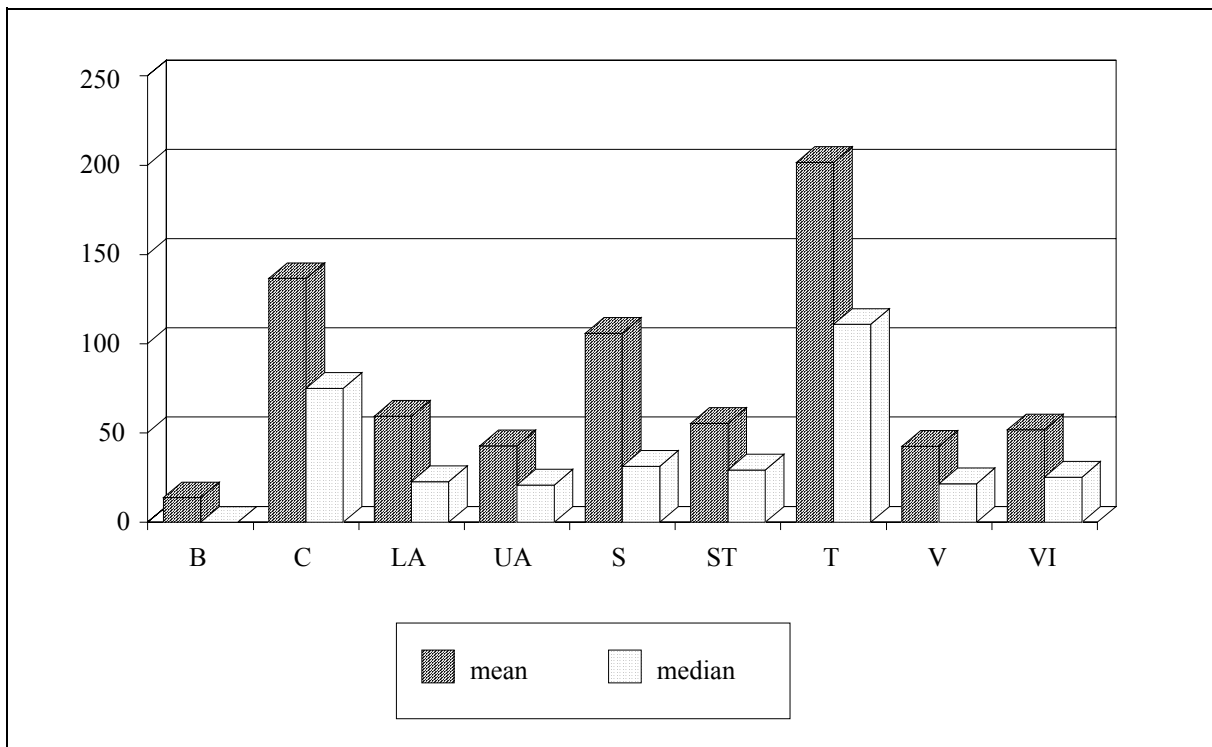
Table 3: The distribution of tourists by their nationality

country of origin	person	[in %]
Vienna	425	9.3
Austria (excl. Vienna)	578	12.6
Germany	1982	43.2
Switzerland	398	8.7
The Netherlands	463	10.1
Great Britain	463	10.1
U.S.A.	276	6.0
Total	4585	100.0

Table 4: The distribution of tourists by the province in which they were interviewed

Austrian province	persons	[in %]
Burgenland	482	10.5
Carinthia	737	16.1
Lower Austria	399	8.7
Upper Austria	407	8.9
Salzburg	642	14.0
Styria	426	9.3
Tyrol	668	14.6
Vorarlberg	421	9.2
Vienna	403	8.7
Total	4585	100.0

Figure 1: Aggregate WTP in million ATS, summer tourism²²



²² B Burgenland, C Carinthia, LA Lower Austria, UA Upper Austria, S Salzburg, ST Styria, T Tyrol, V Vorarlberg, VI Vienna.

APPENDIX: THE SURVEY DESIGN

1. Sample size and type

The population of the survey was generally represented by the tourists spending their summer vacation in Austria. However, financial reasons (especially the costs of translating the questionnaire into different languages) made a restriction to German-, English- and Dutch-speaking summer tourists necessary. The resultant countries of origin - Austria, Germany, Switzerland, The Netherlands, Great Britain, and The United States - are representative of 80 per cent of Austria's total summer tourism. Out of this "sub-population" a proportionally stratified random sample was drawn with the nationality of vacationers and the visited Austrian province as strata variables. 4585 on-site personal interviews were conducted across Austria. For the distribution of tourists by their country of origin and by the province in which they were interviewed, see tables 3 and 4.

Table 3

Table4

2. The WTP question

In the first step it was pointed out to the respondents what is meant by agricultural landscape-cultivating activities (mowing grassland, thinning out forests, and taking care of the rural trail network). Subsequently, the vacationers got informed about plans for establishing an earmarked fund for these agricultural landscape-cultivating services. They were asked the following question.

Suppose, this monetary fund is already established. What is your maximum willingness to pay for your travel party per day into that fund? Remember, please state that amount which you are actually willing to pay.

Currency:

Amount:

3. Descriptive results

- Non-response:

At first glance, 1417 respondents (31 %) stated a zero WTP, 1639 (36 %) revealed some positive number, and 1529 declined answering the question. However, to check whether the zero bids included hidden non-respondents, people who stated zero were asked a subsequent question:

Is your WTP indeed zero, or do you reject this sort of question in general?

434 respondents out of the 1417 zeros stated that they in fact decline to answer the WTP question. This yields an adjusted non-response rate of 43 per cent, which is quite high. One reason for the high non-response rate might lie in the use of the open-ended question format. It is well documented in the literature that this variant generates a higher number of non-responses and more zero-bids in comparison to closed-ended questions (Mitchell, Carson 1989).

Moreover, there is an interesting relation between non-responses and the awareness of non-market services. Prior to the WTP question, the tourists were asked whether they had already noticed landscape-cultivating activities by the farmers during their vacation. 49 per cent of all vacationers responded that they had actually taken notice of these activities. When analysing the non-responses it turns out that only 29 per cent of those vacationers who noticed the services rejected the WTP question, whereas rejection reaches 56 per cent for the group that was not aware of the services. In other words, two-thirds of all non-respondents had not noticed the agricultural services in question before they were interviewed. Thus, increasing some kind of awareness or familiarity may be an important step for reducing non-response rates in future research. Another reason for the high non-response rate might be that people - especially Europeans - are unlikely to be accustomed to either these kinds of scientific survey techniques or the idea of paying for the utilisation of landscape resources. Only a few CV studies on countryside valuation have been conducted in Europe thus far.

- Measures of central tendency, variation, and skewness:

Mean: 9.20 ATS	Median: 3.50 ATS	Min: 0 ATS	Max: 156 ATS	Stand. dev: 15.95 ATS
----------------	------------------	------------	--------------	-----------------------

13 observations lying beyond 200 ATS per person per day and thus reflecting unrealistically high values were previously skipped. The WTP distribution is characterized by a strong positive skewness. Bowley's measure of skewness (bounded between -1 and +1) is 0.30. If we take the 80 per cent of values lying between the first and ninth decile, the arithmetic mean diminishes to 5.50 ATS.

References:

- Arrow, K., R. Solow, P.R. Portney, E.E. Leamer, R. Radner, H. Schuman 1993. *Report of the National Oceanic and Atmospheric Administration Panel on Contingent Valuation*. 58 Federal Register, 4601-4614.
- Bergstrom, J.C, B.L. Dillman, J.R. Stoll 1985. Public environmental benefits of private land: the case of prime agricultural land. *Southern Journal of Agricultural Economics* 17:139-49.
- Blackburn, M., G.W. Harrison, E.E. Rutström 1994. Statistical bias functions and informative hypothetical surveys. *American Journal of Agricultural Economics*, forthcoming.
- Carson, R.T. 1991. Constructed markets. In *Measuring the demand for environmental quality*, eds. J.B. Braden, C.D. Kolstad, North Holland, pp. 121-62.
- Carson, R.T., J. Wright, A. Alberini, N. Carson, N. Flores 1994. *A bibliography of Contingent Valuation, Studies and Papers*. Natural Resource Damage Assessment, Inc., La Jolla, CA.
- Cummings, R.G., G.W. Harrison 1994. Was the *Ohio* Court well informed in its assessment of the accuracy of the Contingent Valuation Method? *Natural Resources Journal* 34, forthcoming.
- Desvousges, W., F.R. Johnson, R. Dunford, S. Hudson, K. Wilson, K. Boyle 1993. Measuring Nonuse Damages Using Contingent Valuation: An Experimental Evaluation of Accuracy in Contingent Valuation. In *Contingent Valuation: A Critical Assessment*, ed. J.A. Hausman, North Holland, New York.
- Diamond, P.A., J. Hausman 1993. On Contingent Valuation Measurement of Nonuse Values. In *Contingent Valuation: A Critical Assessment*, ed. J.A. Hausman, North Holland, New York.
- Drake, L. 1992. The non-market value of the Swedish agricultural landscape. *European Review of Agricultural Economics* 19:351-64.
- Fisher, A.C. 1994. The Conceptual Underpinnings of the Contingent Valuation Method. Paper presented at the DOI/EPA Workshop on Contingent Valuation to Measure Non-Market Values, Herndon, VA, May 1994.
- Hackl, F., G.J. Pruckner 1994. Subsidizing External Benefits: The Case of Agriculture and Tourism in Europe. Department of Economics, University of Linz, Austria.
- Hanemann, W.M. 1984. Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics* 66:332-41.
- Hanemann, W.M. 1994. Contingent Valuation and Economics. *Journal of Economic Perspectives*, forthcoming.
- Hausman, J.A. (ed.) 1993. *Contingent Valuation: A Critical Assessment*. North Holland, New York.
- Hodge, I. 1991. The Provision of Public Goods in the Countryside: How should it be arranged? In *Farming and the Countryside*, ed. N. Hanley, CAB International.

- Hoehn, J.P., A. Randall 1987. A Satisfactory Benefit Cost Indicator from Contingent Valuation. *Journal of Environmental Economics and Management* 14:226-47.
- Hofreither, M.F. 1993. Optionen zum "Erhalt der Umwelt" im Falle eines EG-Beitritts. Institut für Wirtschaft, Politik und Recht, Universität für Bodenkultur, Wien.
- Kahnemann, D., J.L. Knetsch 1992. Valuing public goods: the purchase of moral satisfaction. *Journal of Environmental Economics and Management* 22:57-70.
- Kealy, M.J., J.F. Dovidio, M.L. Rockel 1988. Accuracy in Valuation is a Matter of Degree. *Land Economics* 64(2):158-71.
- Kealy, M.J., R.W. Turner 1993. A Test of the Equality of Closed-Ended and Open-Ended Contingent Valuations. *American Journal of Agricultural Economics* 75:321-31.
- Krström, B. 1993. Comparing Continuous and Discrete Contingent Valuation Questions. *Environmental and Resource Economics* 3:63-71.
- Maddala, G.S. 1983. *Limited dependent and qualitative variables in econometrics*. Econometric Society Monographs, Cambridge University Press.
- Market 1992. *Vielgerühmtes Österreich*. Umfrage des Meinungs- und Mediaforschungsinstitutes zum Selbstverständnis der Österreicher, Linz.
- Mitchell, R.C., R.T. Carson 1989. *Using surveys to value public goods*. John Hopkins University for Resources for the Future, Baltimore.
- Navrud, S. 1992. *Pricing the European Environment*. Scandinavian University Press / Oxford University Press, Oslo / Oxford.
- Navrud, S. 1994. Economic Valuation of External Costs of Fuel Cycles. Testing the Benefit Transfer Approach. In *Models for Integrated Electricity Resource Planning*, ed. A.T. de Almeida, Kluwer academic publishers.
- Navrud, S., G.J. Pruckner 1994. Environmental valuation - To use or not to use? A comparative study of the USA and Europe. Working paper, Department of Economics and Social Sciences, Agricultural University of Norway.
- Pevetz, W., O. Hofer, H. Pirringer 1990. *Quantifizierung von Umweltleistungen der österreichischen Landwirtschaft*. Bundesanstalt für Agrarwirtschaft, Schriftenreihe Nr. 60, Wien.
- Pruckner, G.J. 1993. Strukturelle Veränderungen in der österreichischen Landwirtschaft - Eine ökonomisch-soziologische Betrachtung. *Berichte über Landwirtschaft* 71:316-35.
- Pruckner, G.J. 1994a: *Die ökonomische Quantifizierung natürlicher Ressourcen - Eine Bewertung überbetrieblicher Leistungen der österreichischen Land- und Forstwirtschaft*. Verlag Peter Lang, Frankfurt/Main.
- Pruckner, G.J. 1994b: Bäuerliche Landschaftspflege und Fremdenverkehr - Eine Tourismusuntersuchung für Österreich. *Agrarwirtschaft* 43/3:136-43.
- Pruckner, G.J., M.F. Hofreither 1991. *Die Bewertung überbetrieblicher Leistungen und negativer externer Effekte der österreichischen Landwirtschaft*. Forschungsbericht des BMLF, Wien.

- Seip, K., J. Strand 1992. Willingness to Pay for Environmental Goods in Norway: A Contingent Valuation Study with Real Payment. *Environmental and Resource Economics* 2:91-106.
- Smith, V.K. 1992. Arbitrary values, good causes, and premature verdicts. *Journal of Environmental Economics and Management* 22:71-89.
- Smith, V.K. 1993. Lightning Rods, Dart Boards, and Contingent Valuation. Departments of Economics and Agricultural and Resource Economics, North Carolina State University.
- Walsh, R.G., D.M. Johnson, J.R. McKean 1989. Issues in Nonmarket Valuation and Policy Application: A Retrospective Glance. *Western Journal of Agricultural Economics* 14(1):178-88.
- Willis, K., G. Garrod 1991. Landscape Values: A Contingent Valuation Approach and Case Study of the Yorkshire Dales National Park. Countryside Change Working Paper Series, Department of Agricultural Economics and Food Marketing, University of Newcastle upon Tyne, UK.
- Winters, L.A. 1988. The so-called "non-economic" objectives of agricultural policy. OECD Department of Economics and Statistics Working Papers, no. 52.