Summary of the case study on valuation of the forest ecosystem services

Title of the valuation study: **Status Quo Effect in Choice Experiments: Empirical Evidence on Attitudes and Choice Task Complexity**
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Objectives of the study

Individual decision-making processes in choice experiments (CE) show usually a disproportionate number of respondents choosing the status quo (SQ) alternative. This phenomenon is known as the status quo (SQ) effect. Therefore, the choice of experimental design of a CE can strongly influence the properties of the preference estimates. Nevertheless, it is still unclear what motivates individuals to disproportionately select the SQ alternative.

Using two CEs for assessing the value of different levels of forest biodiversity in two areas of Lower Saxony (Germany), the paper analysed various reasons for an SQ effect. To shed light on the determinants of choosing the SQ the authors elicited a protest attitude, an attitude toward forest conservation, perceived choice task complexity, and the respondents' socio-economic characteristics. Thus, the respondents´ profiles were incorporated in different econometric models (conditional logit, error component logit and random parameter logit).

The overall objective of the study was to determine whether changes in forest biodiversity through the governmental long-term ecological forest development program (LOEWE program) would increase the welfare of people living in two regions of Lower Saxony.

Scope of the study

The study evaluated several habitat services (species diversity, habitats for endangered plant and animal species, plant and animal species diversity, forest stand structure and landscape diversity). The geographical scope covered was regional.

The two study areas were located in Lower Saxony, Germany (Lüneburger Heide and Solling/Harz). The LOEWE program of the regional government comprises 13 principal future objectives for the forest management. The aim is to enlarge of broad-leaved and mixed forests, to change the choice of tree species appropriate to site, and to improve the stand structure in Lower Saxony. The region has around one quarter of the total area covered by forests (1.1million ha) with a very high percentage of secondary coniferous stands in the surveyed regions. The change of the ratio between broadleaved and coniferous stands will also have an impact on forest biodiversity and the social welfare.

Valuation method(s) applied

Based on the results from six **focus groups**, carried out in both study regions, the authors used a set of four attributes to describe possible changes in forest biodiversity to respondents. Depending on the SQ, the four biodiversity attributes had 2-3 levels. The price attribute had six levels in both studies (Table 1).

Table 1 Atributes and levels used in choice experiments

Attribute	Level	
	Lüneburger Heide	Solling/Harz
Habitats for protected and endangered plant and animal species (*HAB*)	Medium, high	Low, medium, high
Plant and animal species diversity (*SPD*)	Medium, high	Medium, high
Forest stand structure (*FSS*)	Low, medium, high	Low, medium, high
Landscape diversity (*LCD*)	Low, medium, high	Low, medium, high
Contribution in € to "forest conversion" fund (*FUND*)	5, 10, 20, 35, 50, 75	5, 10, 20, 35, 50, 75

Note: Status quo is underlined. In the status quo, the contribution to the fund is €0.

A **main effects design** was obtained using SAS macros. The design resulted in 36 choice cards, which were blocked again into six blocks, each with six cards. Hence, each choice card consisted of the SQ and two designed alternatives.

In the two surveyed regions, 621 **face-to-face interviews** were taken. In order to identify reasons for the SQ effect in the choice experiments, the authors formulated additional **statements** (Table 2). Thus, the respondents answered to the statements given on a five-point-scale.

Table 2 Measurement instruments

Statements	Agreement in %	
	Lüneburger Heide (N = 291)	Solling/Harz (N = 309)
Protest Attitude (PRO)		
I already pay enough for other things.	57	54
Lower Saxony should cut public spending for other things instead of expecting a voluntary contribution from me.	56	58
It is my right to have a high level of biodiversity in forests and not something I should have to pay extra for.	51	49
I refuse to assess nature in monetary terms.	55	58
Attitude toward Forest Conversion (AFC)		
Compared to other policy measures, forest conversion is not a high priority.[a]	42	40
The current percentage of broad-leaved forests in the Lüneburger Heide (Solling-Harz region) is completely sufficient. From my point of view, there is no need to increase it.[a]	38	40
Perceived Choice Task Complexity (COM)		
It was easy to compare the different forest-conversion programs with each other.[a]	19	29

Note: Five-digit response scale: strongly disagree, disagree, partially disagree/partially agree, agree, strongly agree. Agreement means agree or strongly agree.

[a] Disagreement is seen as indicating a positive attitude and a higher perceived choice task complexity; percentage points are given for disagreement.

A **factor analysis** based on the four statements measuring protest beliefs resulted in a one-dimensional solution. Based on the responses to these four statements, an additive index "**protest attitude**" was constructed for each sample.

For identifying the systematic and the stochastic components of the SQ effect, the **error component logit (ECL)**, the **random parameter logit (RPL)** and **the conditional logit (CL)** were applied. The estimations of the choice probabilities were approximated by simulations based on **150 Halton draws**.

Key results

- **Lower likelihood to choose SQ**: high attitude towards forest conservation, higher educated respondents, decreasing age, frequent forest user, decreasing costs for forest-conservation programs or occurrence of forest biodiversity attributes.

- **High likelihood to choose SQ:** high protest attitude, people with difficulties to compare the alternatives given (low education), increasing age, not frequent forest user, increasing costs for forest-conservation programs or no occurrence of forest biodiversity attributes.

- This Table 3 reports the estimation of the compensating surplus (CS) values per person and year based on the ECL for a one-unit increase in species diversity. Thus, the CS represents the willingness to pay for an environmental change in question.

Table 3 Compensating surplus per person per year in Euros

	Lüneburger Heide	Solling/Harz
With ASC_{SQ}	81.71 (27.78 to 135.63)	77.13 (32.02 to 122.23)
Without ASC_{SQ}	−46.15 (−59.97 to −32.35)	−22.91 (−32.99 to −12.84)

Note: The estimates are based on the error component logit models in Tables 4 and 5; the levels of the forest-biodiversity attributes are set to the outcome of the LOEWE forest-conversion program (note 7); the estimations with the ASC_{SQ} refer to a "reference respondent," who is a nonuser with mean values for the remaining individual-specific variables.