METHOD FACTSHEET

Stated preference valuation

Introduction

Stated preference valuation is family of techniques which use individual respondents' statements about their preferences to estimate change in utility associated with a proposed increase in quality or quantity of an ecosystem service or bundle of services (Bateman, Carson et al. 2002). Respondents are presented with one or more hypothetical policy or project scenarios that lead to a specified environmental change compared to a baseline situation. The answers respondents give, in the form of monetary amounts, ratings, or other indications of preference, are scaled following an appropriate model of preferences to yield a measure of value of the proposed ecosystem service change. This value is often monetary expressed as people's willingness to pay (WTP). Stated preferences are often elicited through surveys (typically web, phone, mail or in-person) that use questionnaires following strict guidelines. The surveys are administered to representative samples of the people affected by the environmental change and mean WTP per household or person is then aggregated over the relevant population as a measure of welfare change.

The two most common forms of stated preference methods are contingent valuation (CV) and choice experiments (CE) (Hensher, Rose et al. 2005). CV elicits value by directly asking respondents for their WTP for the change in the ecosystem service(s). CE breaks the description of the environmental good into physical attributes, where each attribute has different levels. The respondents then face a number of choice sets with different combinations of physical attribute levels combined with a cost attribute. This design indirectly reveals the respondents' trade-offs between money and changes in individual attributes. This is used to calculate their WTP for a change in ecosystem services as described by the combinations of the attributes.

Keywords

Hypothetical policy scenario; Willingness to pay; Survey; Representative sample; Individual welfare change; Trade-offs.

Why would I chose this approach?

Stated preference (SP) methods are highly flexible. Their flexibility is both an advantage and a potential source of misuse. SP can in principle generate monetary willingness to pay (or accept) estimates of direct, indirect or non-use values. Hypothetical scenarios for measures delivering just about any ecosystem service can be defined. SP methods can address a number of decision contexts. They have been used to generate aggregate willingness-to-pay estimates for public goods for the purposes of awareness-raising. Their relevance for systems of environmental and economic accounting is limited because of recommendations to use only exchange-based data (UN 2014). Stated preference values are in principle well suited for inclusion in benefit-cost analysis and decision-support for priority-setting, although their application to actual policy choices outside the academic literature has been limited (Laurans, Rankovic et al. 2013).

SP methods are in principle well-suited for instrument design, such as assessing willingness-to-pay for user-financed public utilities, which may be co-produced by ecosystem functions (e.g. water and sewage) (Brouwer, Barton et al. 2009). Where the regulatory system permits it, stated preference methods may be

used 'as a valuation method of last resort' to assess the equivalence of restoration measures in natural resource damages (Gard and Desvouges 2013). SP is particularly flexible in terms of defining hypothetical institutional contexts for delivery of ecosystem services. SP is a 'value articulating institution' (Vatn 2005) because values are highly contingent on the institutional framing used in the survey. SP methods require statistically representative samples of populations concerned with public policies. For this reason, they often sample respondents at city-wide, regional or national level spatial scale. Spatial resolution of the SP data can also be high if individual respondents are asked to react to hypothetical changes in ecosystem services in their local environment.

What are the main advantages of the approach?

Methodological

- Recognised and established approach within environmental economics;
- Covers wide range of ES, use and non-use values;
- Trade-offs between ES and a few other context characteristics can be evaluated using choice experiments;
- Uncertainty at the population level can be addressed, as quantified variance in willingness-to-pay across respondents;
- Representative sampling of populations.

Governance

- Highly flexible in terms of defining management and policy scenarios;
- Can be combined with consultative focus group methodologies;
- Structured opinion polling, referendum-type data.

What are the constraints/limitations of the approach?

Because of the wide variety of contexts to which SP has been applied, not all problems apply to all SP studies at once. However, looking across SP studies the main challenges can be summarised as (Vatn 2005):

- Information problems
    - Demarcation and composition of ecosystem services; valuation scenarios specify management actions for land or water use which affect multiple ecosystem services;
    - Functional invisibility of ecosystem services; difficulties in communicating multiple ecosystem functions in valuation scenarios;
    - Incommensurable or lexicographic preferences; respondents may be unwilling to accept trade-offs between ecosystem services and money.
- Individual values, ethics, social choice
    - Willingness-to-pay measures assume respondents don't hold rights to the status quo in terms of environmental quality;
    - Respondents may hold norms and moral commitment to their environment that they are not willing to trade against prices in monetary exchange.
- Rational choice assumptions and biases
    - Part-whole bias; the sum of WTP of parts of ecosystems typically exceeds willingness to pay for the system as a whole;
    - Sequence bias; the order in which parts of ecosystems are valued affects willingness-to-pay; the framing of choices affects values ;
    - Yeah-saying; stated preference surveys often overestimate willingness-to-pay relative to what respondents would actually pay in revealed preference situations;

- Prices informing preferences; respondents will not have pre-formed monetary preferences for ecosystem services; even for market goods price often assists consumers in forming preferences;
- Socially contingent preferences; respondents preferences change with the social setting and their roles in those settings (as consumers, voters etc.).

What types of value can the approach help me understand?

Stated preference methods are highly appropriate to elicit monetary values. Taking into account the Total Economic Value framework, SP methods are capable of capturing direct use values, option values, bequest values and existence values. They are limited in their ability to provide ecological values and values for the intrinsic value of nature.

How does the approach address uncertainty?

The methods aim at obtaining a representative sample of the population potentially affected by the policy or project. The method generates a probability distribution of 'willingness-to-pay' or '–to-accept' for the population, which can be used to calculate confidence intervals for the stated value of a change in the ecosystem service. Stated preference valuation uses multi-variate methods which make it possible to test whether variables explaining 'willingness-to-pay' or 'willingness-to-accept' are statistically significant.

How do I apply the approach?

For an overview of the consecutive methodological steps, see Figure 1. Stated preference methods are most time consuming in the initial steps of (1) defining the valuation scenario and (2) designing the survey. Once these steps are complete, testing implementation and analysis are relatively straightforward activities. Figure 1 illustrates the dependence of generated values on a large number of inter-related survey design decisions which make SP-values highly context specific. Choice experiment and contingent valuation differ from one another mainly in (2) the design of the choice situation and (7) estimation of willingness-to-pay for ecosystem service.

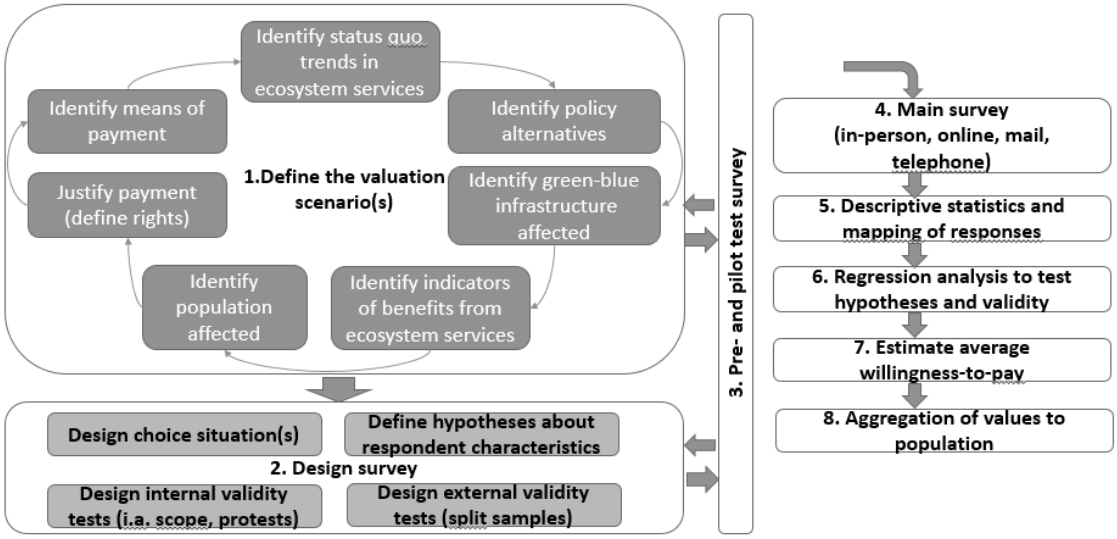

Figure 1. Stepwise approach to stated preference methods.

Requirements

Requirements		Comments
Data collection requierement	□ Data is available □ Need to collect some new data (e.g. participatory valuation) **X Need to collect lots of new data (e.g. valuation based on surveys)**	
Type of data required	**X Quantitative** □ Qualitative	
Expertise and production of knowledge needed	**X Working with researchers within your own field** **X Working with researchers from other fields** **X Working of non-academic stakeholders**	SP scenarios often defined through focus groups with stakeholders; high quality studies define environmental characteristics of scenarios with natural scientists
Software requirements	□ Freely available **X License required** **X Advanced software knowledge required**	Licenced econometric software packages (e.g.STATA, NLOGIT, Sawtooth)
Time requirements	□ Short-term (less than 1 year) **X Medium-term (1-2 years)** □ Long-term (more than 2 years)	
Economic resources	□ Low-demanding (less than 6 PMs) **X Medium-demanding (6-12 PMs)** **X High-demanding (more than 12 PMs)**	Depending on complexity of the ecosystem service, the scale of the study, and available expertise
Other requirements		

Where do I go for more information?

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Bateman, I., et al. (2002). Economic Valuation with Stated Preferences Techniques. A Manual.

Brouwer, R., et al. (2009). Economic Valuation of Environmental and Resource Costs and Benefits in the Water Framework Directive: Technical Guidelines for Practitioners. Institute for Environmental Studies, VU University Amsterdam, the Netherlands.

Gard, N. W. and W. H. Desvouges (2013). Technical and economic issues and practices in ELD application. The EU Environmental Liability Directive. A Commentary. L. Bergkamp and B. J. Goldsmith. Oxford, Oxford University Press**:** 220-247.

Hensher, D. A., Rose, J. M., & Greene, W. H. (2005). *Applied choice analysis: a primer*. Cambridge University Press.

Laurans, Y., et al. (2013). "Use of ecosystem services economic valuation for decision making: Questioning a literature blindspot." Journal of Environmental Management **119**: 208-219.

UN (2014). System of Environmental-Economic Accounting 2012 - experimental ecosystem accounting. United Nations, New York, UN,EC,FAO,IMF,OECD, World Bank.

Vatn, A. (2005). Institutions and the environment. Cheltenham, UK ; Northampton, MA, Edward Elgar Pub.

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