METHOD FACTSHEET

Travel cost methods

Introduction

The travel cost methods (TCM) is based on the observation that recreational services can only be realised through physical access to nature. This implies that individuals seeking to enjoy the service will need to spend resources (time and money) to travel to the site. The travel activity is a reflection of the use value this service has to people. The travel costs method was first applied in the US in 1959 to value the recreational use of nature. There are basically two different types of travel cost methods; one based on a valuation of a single site and one based on choices between multiple sites. In this overview the use and requirements for these two methods are described separately. The single site method is simple and is appropriate when the site in question is of particular interest and significance. The multi-site method is appropriate when the researcher is interested in valuing the attributes of recreational sites, i.e. to determine the importance of environmental attributes, recreational facilities and accessibility not just site access. Accessibility to the sites must be calculated using GIS and preferably distances to the sites through the road network to generate accurate value estimates. Econometric methods are used to estimate recreational demand functions (single sites) and models of choice of visit (multiple sites).

Keywords

accessibility, recreational services, direct use values

Why would I chose this approach?

TCM has been extensively used to demonstrate the value of eg. forests for other services than timber production. This is potentially powerful for awareness raising. In existing studies TCM has successfully been used to show that provisioning services often only account for a small part of the services associated with natural or semi-natural areas. The recreation value has also been used to make the economic case for afforestation initiatives in a general sense. However, there are few applications of TCM in real decision making in relation to concrete project evaluations.

The spatial scale at which TCM works best depends on the type of recreational activites being valued. The scale needs to include the range of distances people travel to experience nature. If the recreational activity includes trips to unique sites to which recreationists travel great distances, the spatial scale of analysis needs to be larger than if the study focuses on park recreation in an urban context. Most studies choose a regional scale or a national scale. The TCM directly measures recreational services. It can be argued that the TCM provides conservative estimate as the value of natural and semi-natural habitats are also reflected in other marksts, such as the house market (see the description of the HPP method). A challenge when applying the TCM is the costing of time, as the researcher needs to make assumption about how respondents could have used their time if not used for recreational travel. Such assumptions are often difficult to validate in empirical studies. In a similar way, spending time on site also reflect that people find

the activity worth while as they could have spend their time on competing activities. It is customary to include time in the travel costs by using a share of the hourly wage, reflecting that people usually haven't got completely flexible hours of work. Several studies have analysed the sensitivity of the assumptions about alternative options for people's time and therefore the costs associated with spending time on recreational travel. The time spend on-site is not considered a cost and not accounted for in travel costs studies.

What are the main advantages of the approach?

- Travel cost is a recognised and established approach.
- It draws on revealed data which is often stated as an advantage as hypothetical biases from using stated preference methods are avoided.
- The method can be used to provide a public policy rationales for providing green spaces for recreational activities.
- It can be used to study designs of recreational site quality.

What are the constraints/limitations of the approach?

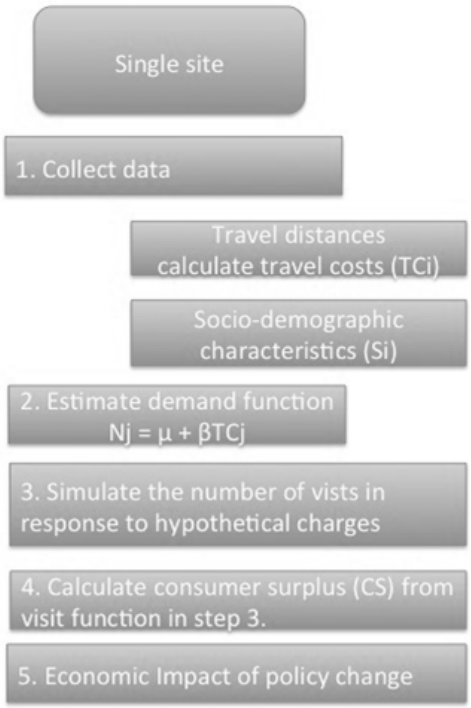
- It requires large data sets on recreational activities
- It requires extensive GIS pre-processing of travel cost data and site characteristics (multiple site approach).
- The methods is specific to estimation of recreational service and cannot be generalised to estimate a range of other services.
- Results are highly sensitive to assumptions about cost of time.

What types of value can the approach help me understand?

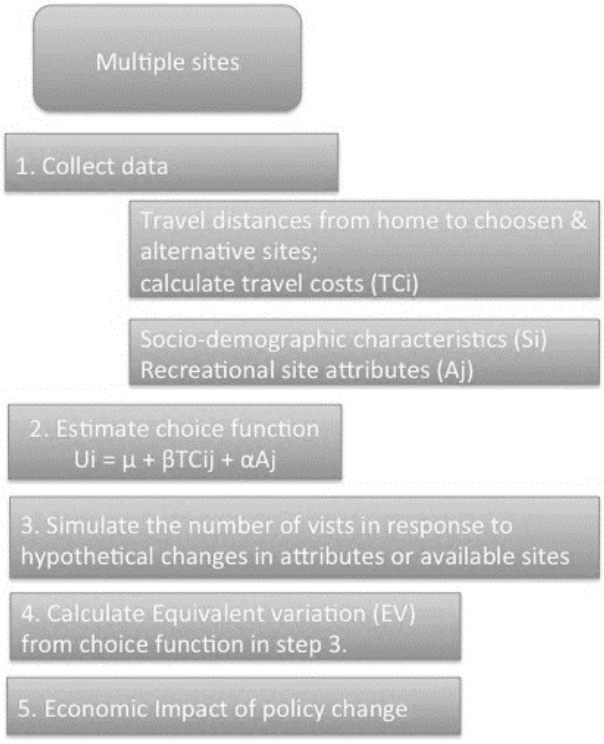
Travel cost methods are highly appropriate to elicit sociocultural values and anthropocentric instrumental values attached to nature's benefits, including direct use values. It is not appropriate to grasp ecological values, or any kind of intrinsic values of nature. Neither is it applicable to elicit indirect use, option, bequest or existence values.

How do I apply the approach?

The flowcharts below provide with a short description of the steps to apply TCM using a single site and a multiple site approach. The steps can roughly be divided in two parts. The first analytical part (steps 1-3) organises the data, conducts the statistical analysis and estimates a model of recreational behavior. This is often as far as many research papers take the analysis. The second application part (steps 4-5) will vary depending on the decision context. In the flowchart below the steps relate to using the method for finding aggregate values of different policy changes for awareness-raising purposes or concrete policy evaluation.



Steps in a zonal travel cost analysis; i refers to individual; j refers to geographical zone.



Steps in a discrete choice travel costs analysis

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	□ **Working with researchers within your own field** □ Working with researchers from other fields □ Working of non-academic stakeholders	Data on travel costs are mainly collected by economists themselves. GIS estimates of network distances and data on sites attributes are sometimes collected with help from researchers from other fields.
Software requirements	X **Freely available** X License required □ Advanced software knowledge required	For example "R" ArcGIS requires a licence Multiple-site travel costs estimates are usually conducted in specialised software such as STATA, NLogit or simlar, but free software exist such as Blogene.
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)** □ High-demanding (more than 12 PMs)	
Other requirements	-	

Where do I go for more information?

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