

Workshop

“Tools and guidance for assessing resource and environmental cost in the WFD”

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CVM - Contingent Valuation Method



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Structure of the presentation

- CVM history
- What are the CVMs?
- Total economic value and the CVM
- When we can use CVM
- Structure of the questionnaire
- Advantages, bias and limitations
- Examples



CVM: history

First applied in the U.S. in the 1960s

Came to prominence in early 1990s, due to use in Exxon *Valdez* lawsuits

Number of studies:

1995: 2000 studies in 40 countries

2015: 9000+ studies in more than 100 countries

Bilateral aid agencies and international development banks are increasingly using CVM in project appraisal and policy analysis.



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What is a CVM?

Simplest method: contingent valuation method (CVM)

Contingent valuation surveys are methods for measuring non-market and more specifically, non-use values!!

- Involves a single good
- Individuals are asked to state their maximum WTP or minimum WTA for a change in the good
- If individuals answer truthfully, their answers will exactly correspond to the utility change

More complex methods involve multiple goods, or multiple attributes of single goods and involve modeling

It is a survey-based method

It is often termed a “direct” valuation method, since individuals are asked to state directly their WTP to obtain an environmental benefit or their WTA to tolerate an environmental cost

Contingent: valuation is dependent on a hypothetical scenario put to respondents.



Total economic value concept and the CVM (1)

Opposite the opportunity costs of water is the economic value or benefit of a specific water use.

A distinction has to be made between **market and non-market values**.

Market value is the value of water when sold on a market if there exists any.

Ex: water sold on a **market** as a raw input in an economic production process, for final domestic use (tap water), or the value of market goods and services provided by aquatic ecosystems, such as fish or reed.

In cases where there exists **no market**, for example when the water resource is treated as a common property, open-access resource where property rights are not defined or not enforced, values can be measured through individuals' preferences for the conservation or improvement in water resource quality as well as individuals' loss of welfare owing to resource depletion or quality decline.

The value people attach to un-priced natural resources such as water and the services these resources provide is measured in money terms through the concept of individuals' willingness to pay (WTP) or willingness to accept (WTA) compensation.



Total economic value concept and the CVM (2)

The aggregated WTP or WTA amount provides an indicator of their **total economic value** (TEV).

Environmental economists have introduced a distinguish between use values and non-use values, in order to account for the various reasons and motives people may have to value environmental change.

Use values are associated with the actual or potential future use of a natural resource (e.g. drinking water, fish consumption, irrigation water).

Non-use values are not related to any actual or potential future use, but refer to values attached to the environment and natural resource conservation based on considerations that, for example, the environment should be preserved for future generations or because plants and animals also have rights.

Willingness to pay relates essentially to individuals' ability to pay, which determines the relative weights assigned to their preferences.



When we can use CVM

Contingent valuation surveys have a long history in environmental economics.

CVM is both an economic tool and community analysis tool.

It is considered most useful during the strategy development phase, in deciding how much to charge for a good or service.

It allows to link planning options to their affordability, so it is useful for determining pricing of services related to the standard provided.

CVM surveys are designed to get respondents to state their preferences for a public good in a hypothetical market.

They are one of the few methods for measuring non-market and more specifically, non-use values.



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Description of the technique

The approach is based on interviews with a representative sample group in an area.

The interview consists of:

- A detailed description of the good(s) being valued and the hypothetical circumstance under which it is made available to the respondent.

Respondents are usually asked to:

- value several levels of provision
- express their willingness to pay for the good to be provided.
- Questions about the respondent characteristics (age, income), their preference relevant to the good(s) being valued, and their use of the good(s).



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Components of questionnaire

1. Collect information on respondent's past, present, and expected future use of the good
2. Present a hypothetical scenario describing the change in the good to be valued
3. Present the hypothetical payment mechanism and related stipulations
4. Collect information on respondent's socioeconomic characteristics, available substitutes and complements for good being valued
5. Debrief respondent (e.g., check budget constraint) and enumerator



Principal advantages of CVM

In principle, willingness-to-pay (WTP) and willingness-to-accept (WTA) responses obtained by CVM equal theoretically correct monetary measures of utility changes

CVM can be used to estimate non-use (passive use) values, like existence values



Limitations of the CVM

- The results are dependent on respondents understanding and being able to visualize the circumstance of the good being considered.
- People have practice making choices with market goods, so their purchasing decisions in markets are likely to reflect their true willingness to pay.
- CVM assumes that people understand the good in question and will reveal their preferences in the contingent market just as they would in a real market.
- Alternatively, some respondents may value the good, but state that they are not willing to pay for it.
- WTA very significantly exceeds WTP.
- Estimates of nonuse values are difficult to validate externally.



Potential biases in CVM studies

- *Information bias*: amount and type of information provided on hypothetical good might affect stated WTP
 - But this is true of any consumption decision
- *Operational bias*: respondents' understanding of the good might differ from researcher's
- *Design bias*
 - *Starting-point bias*: respondents might interpret starting point in bidding game as conveying information about value of the good
 - *Vehicle bias*: choice of payment vehicle (e.g., entrance fee vs. higher taxes to fund park) might affect stated WTP
- *Hypothetical bias*: respondents might ignore real-world costs and benefits of consuming the good (e.g., budget constraint)
- *Strategic bias*: e.g., individuals misstate actual WTP ("free-riding")



Criticisms of CVM

1. Respondents fail to take CVM questions seriously because they are non-binding
2. Respondents do not understand what they are being asked to value
3. Respondents strategically manipulate the process by distorting their true WTP
4. Respondents give answers that are inconsistent with economic theory.



Interpreting “yes/no” responses

- Interpretation of CVM questions can involve a large cultural component
 - Hence, must word questionnaires carefully
- During pretesting of questionnaire in a village in Romania, all respondents said “yes” to hypothetical connection fees and monthly tariffs for improved water and sanitation services, no matter how high
 - When debriefed enumerators, discovered that respondents actually said, “yes, but ...”



Example: improved water supply in Romania

The services analyzed: Municipal environmental services: water supply, sewerage, solid waste disposal

Central planners had designed municipal services without taking households' preferences into account

- many households were dissatisfied and demanding improvements

CVM study in Iasi (350,000 inh)

- Objectives:
 - **to determine households' willingness to pay for improved cold and hot water services and improved solid waste disposal**
 - **to help municipal authorities determine which service options households prefer—and are willing to pay for.**



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Table 2. Description, frequency of different “no” responses (Semarang, Indonesia)

Description of response	Number of times recorded	Percent of responses
I cannot afford it	52	32
I need to know others’ opinion about the program	49	30
I agree but the costs are too high	30	18
Yes, if the costs are reduced	11	7
I have many expenses, children, etc.	8	5
I agree, but the current situation is satisfactory	6	4
I agree, but I do not want to pay in advance	4	2
Yes, if the payment period is extended	2	1
Yes, if participation is mandatory	1	<1
I can pay, but I want to avoid rumors about my wealth	1	<1
Total number of verbatim responses	164	100%



Thank you!



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