

# Chapter 15 Contingent Valuation: Using Surveys to Elicit Information about Costs and Benefits

## Contingent Valuation (Method), CV or CVM

Questionnaires designed to elicit preferences (people's willingness-to-pay) for changes in quantities or qualities of goods.

e.g. Water quality of recreation sites, goose hunting, sports stadiums, outdoor recreation, wild life opportunities, and so on.

- Valuing the use or potential use: Relatively uncontroversial
- Valuing the passive use or nonuse: More controversial

### General Approach

1. Sample of respondents from the population with standing is identified.
2. Respondents are asked questions about their valuations of some good.
3. Respondents provide information that enables analysts to estimate the respondents willingness-to-pay (WTP) for the goods.
4. WTP amount for the sample are extrapolated to the entire population.

# Direct Elicitation (Nonreferendum) Methods

## 1. Open-Ended Willingness-to-Pay Method

Respondents are simply asked to state their maximum WTP for the good or policy.

## 2. Closed-Ended Iterative Bidding Method

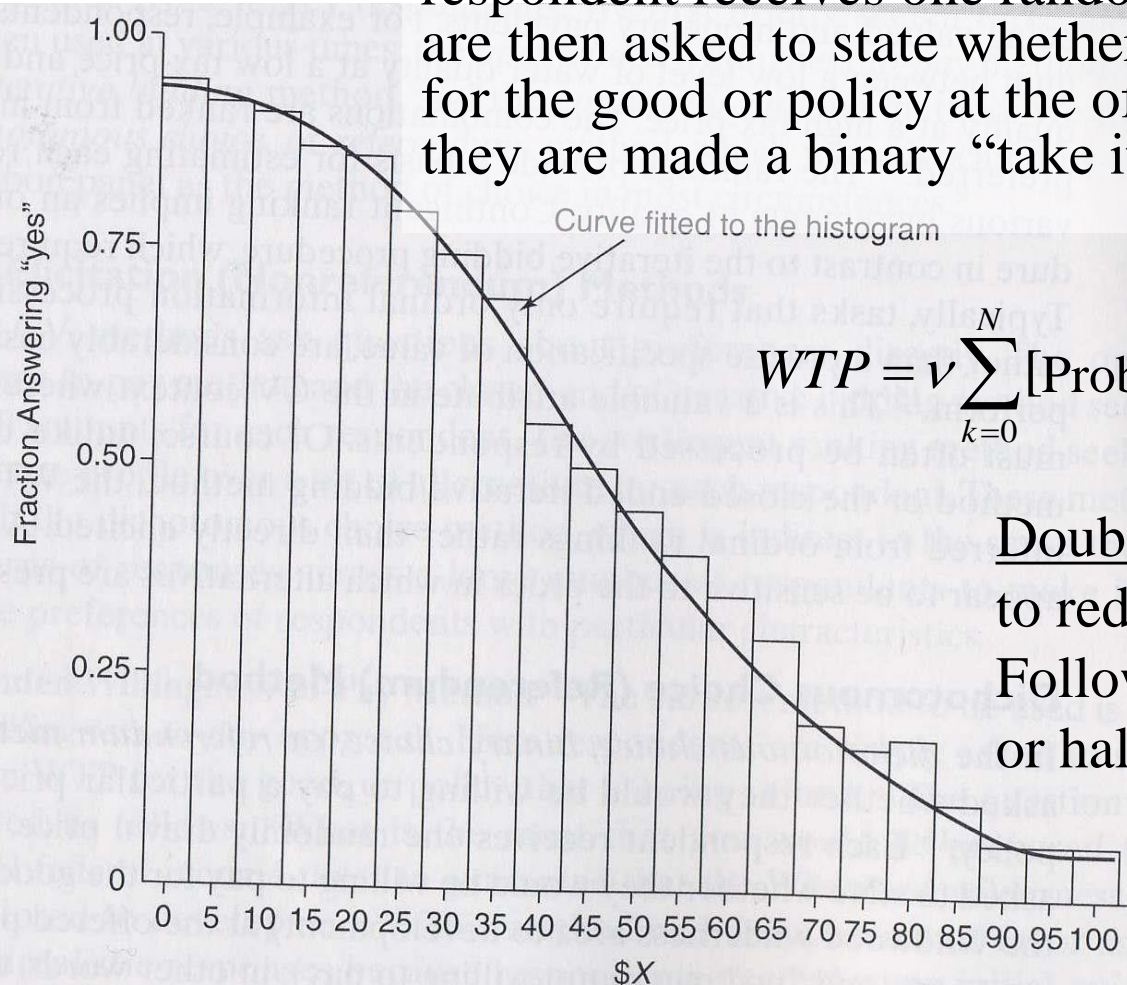
Respondents are asked to whether they would pay a specified amount for the good or policy. If respondents answer affirmatively, the amount is incrementally increased. The procedure continues until the respondent expresses unwillingness to pay the amount specified. *It is rarely used now.*

## 3. Contingent Ranking Method

Respondents are asked to rank specific feasible combinations of quantities of the good being valued and monetary payments. The combinations are ranked from most preferred to least preferred. WTP must be inferred from ordinal rankings rather than directly elicited.

# Dichotomous Choice or Binary Choice (Referendum) Methods

Respondents are asked whether they would be willing to pay a particular price to obtain a good or policy. Each respondent receives one randomly drawn price. Respondents are then asked to state whether they would be willing to pay for the good or policy at the offered price. In other words, they are made a binary “take it or leave it” offer.



$$WTP = v \sum_{k=0}^N [\text{Probability of acceptance at price } kv]$$

Double dichotomous choice:

to reduce the need for large samples.  
Follow-up offer either double (if yes)  
or half (if no).

# Payment Vehicle

Almost all CVM exercises specify a payment vehicle (way) for helping ensure that respondents perceive the questions as real economic choices.

e.g. taxes, increased bills, higher income, higher produce price, etc.

## Sample

Sample design: Random Sample - Simple random samples & Stratified samples

The relevant target population is usually all individuals with standing who are *affected* by the policy. Who is affected?

1. “users”
2. Just for themselves or as a representative for their whole household
3. Concerning the inclusion of passive use benefits
4. Geographic spread

## Non-response Biases

Following respondents should be excluded in estimating WTP.

They provide either zero or extremely high valuations (outliers).

1. Reject the whole notion of placing a value on the good
2. Refuse to take the exercise seriously
3. Demonstrate that they are incapable of understanding the survey

# Survey Administration

	<i>Cost per Completed Interview</i>	<i>Ease of Identifying and Reaching Respondents</i>	<i>Risk of Interviewer Bias</i>	<i>Maximum Complexity of Provided Information</i>
<b><i>In-Person</i></b>	Very high—depends on questionnaire length and geographic spread	Medium—depends on availability of lists and access	High—personal presence, monitoring difficult	Very high—interactive communication and visual aids possible
<b><i>Telephone</i></b>	High—depends on questionnaire length and call-backs	Very high—random digit dialing	Medium—interviewer cues	Low—verbal communication limits complexity of content
<b><i>Mail</i></b>	Low—depends on number of follow-ups	High—depends on availability of appropriate lists	Low—uniform presentation	High—visual aids possible
<b><i>Internet</i></b>	Low—marginal costs very small	Low—“spamming” restrictions require panels of willing respondents	Low—uniform presentation	Very high—visual aids and interactive questions possible

# Problems and Issues

1. Hypotheticality, Meaning and Context Problems

2. Neutrality

3. Decision Making Biases and Judgment Biases

e.g. availability bias, representativeness bias, optimism bias, anchoring bias, hindsight bias, status quo bias, probability assessment bias

4. Noncommitment Bias

5. Order Effects

6. Embedding Effects

7. Starting Point Bias

8. Hypothetically Bias vs Judgment Bias

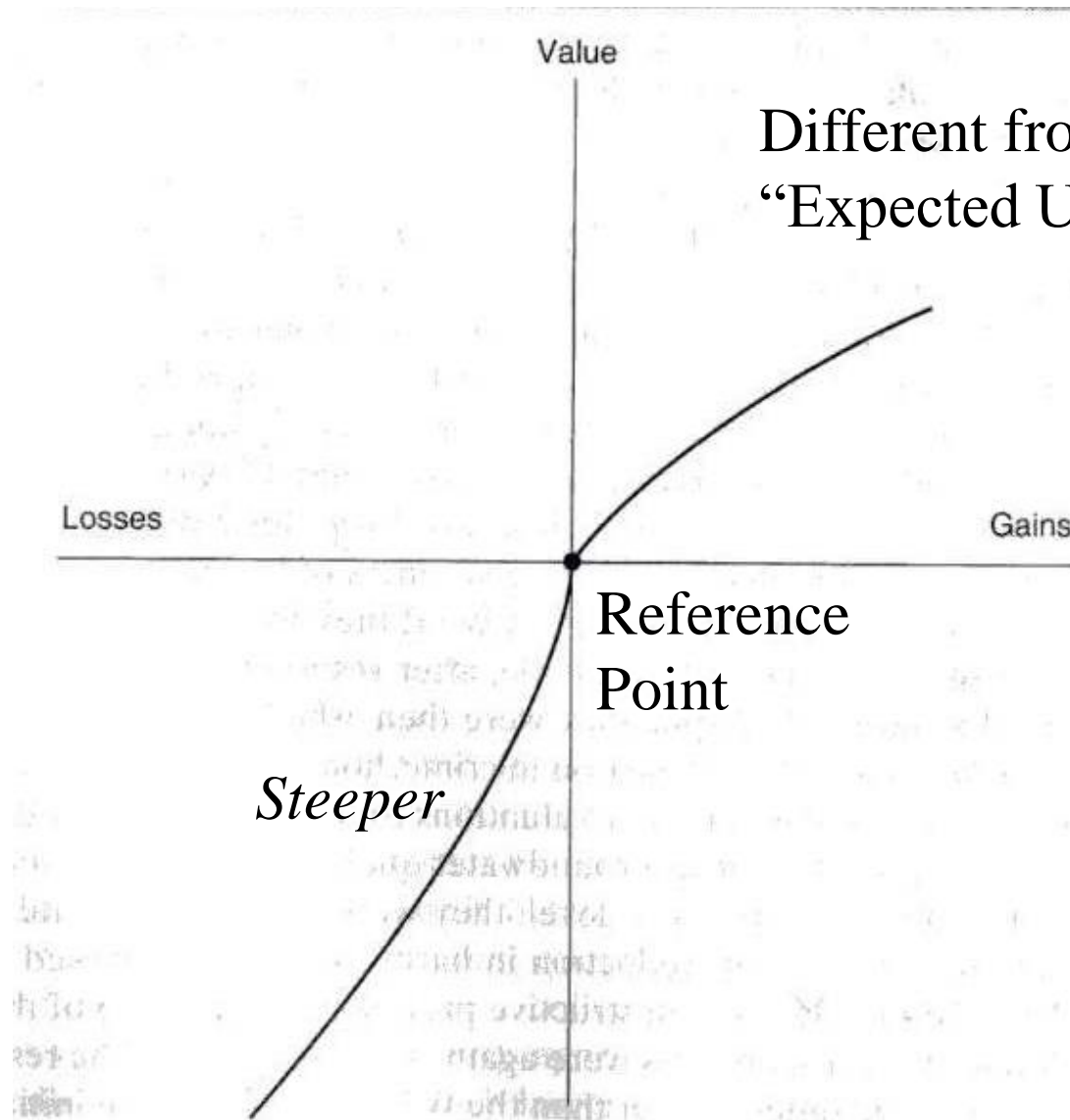
9. WTP vs WTA

## How Accurate?

1. Compare CV values by other indirect methods.
2. Compare between respondents' CV statements and their actual behavior in “experiment”.



# Value Function - Prospect Theory



# WTP vs WTA

Surveying a representative sample of society as to how much they value a particular non-market good. For example, residents may be asked how much they would be willing to pay (WTP) for a certain *improvement* in air quality, or willingness to acceptable (WTA) for minimal *compensation* for the loss of a recreational site.

**Bias:** People may be willing to pay a **\$20 per month (WTP)** rent premium for a 20% reduction in noise impacts (perhaps by moving to a quieter street or installing sound insulation in their homes), but would demand **\$100 per month (WTA)** in compensation for a 20% increase in residential noise.

**Endowment Effect (Loss Aversion):** People demand greater monetary compensation to give up things that they already possess, than they are willing to pay to acquire the same exact item.

Recommendation by authors: WTP formats rather than WTA formats should be used in CV in almost all cases.



# Choice of Shipment Route to Seaport

Now, two routes are available for same origin and destination for inland freight transport. Please choose one route which maximizes your satisfaction. Two routes are differed in terms of shipment cost, average shipment time, variability of shipment time.

Choice of  
Stated  
Preference

Please assume a situation below;

1. You are planning to transport your goods from **Vientiane to Seaport (until loading your goods onto vessel)**
2. Transported goods to seaport will be transported to Europe after the arrival at seaport
3. Your responsibility is transporting goods until loading onto vessel
4. Two routes (ROUTE A and ROUTE B) are available to seaport
5. There are possibilities to arrive early or late due to the unexpected waiting time at border or seaport
6. Transport mode is truck
7. Please choose your preferred ROUTE.

Case 2: Please choose **ROUTE A** or **ROUTE B**

## ROUTE A

Average shipment time: **23 hours**

The shipment cost is **1,300 USD/TEU**

The shipment has an equal chance of arriving at seaport at any of the following times:

- **8 hours early**
- **6 hours early**
- **4 hours early**
- **2 hours early**
- **5 hours late**

A ☐

## ROUTE B

Average shipment time: **17 hours**

The shipment cost is **1,500USD/TEU**

The shipment has an equal chance of arriving at seaport at any of the following times:

- **4 hours early**
- **2 hours early**
- **on time**
- **5 hours late**
- **8 hours late**

B ☒

# Chapter 16 Shadow Prices from Secondary Sources

When knowledge of appropriate demand and supply curves is not readily available, we may use the methods in Chapter 12 through 15 to value the impacts. However, most of these methods are expensive and time consuming.

Least-cost approach would be used a previously estimated “shadow price” or “plug-ins” for measuring the social value of the impacts on CBA

> *Benefit Transfer, Information Transfer*

# Examples of Shadow Prices

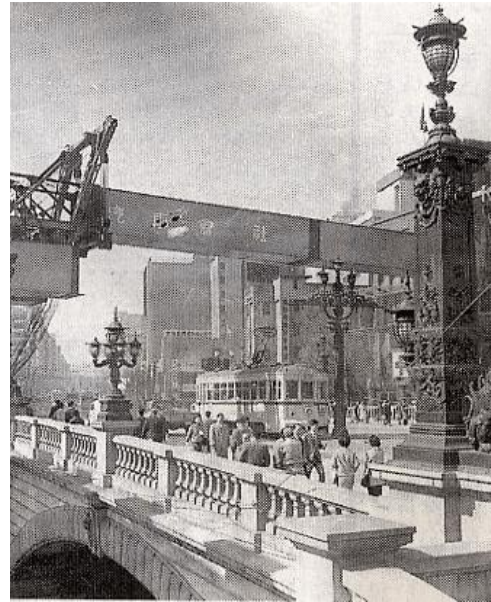
1. Value of a statistical life, Table 16-1.
2. Cost of crashes, Table 16-3.
3. Cost of crime, Table 16-4.
4. Value of time, Table 16-5
5. Value of recreational activities, Table 16-6.
6. Value of environmental impacts, Table 16-7.
7. Cost of noise pollution, Table 16-8.
8. Cost of air pollution, Table 16-9.
9. Social cost of automobiles, Table 16-10.

# Nihonbashi (日本橋)

Open in 1603 as the first year of Edo Period [1603-1867].  
Center point in Edo (Tokyo) and origin of main roads in Japan



1800s



Expressway open over  
the bridge in 1963



Present

Symbol of  
origin





# ETS (Emission Trading System)

CO<sub>2</sub> to be a market good from non-market goods

Ex. EU-ETS, CDM (Clean Development Mechanism)

**General factors contributing to price volatility:**

Fuel (Crude oil) prices, Weather,  
Economic Conditions, Policy developments



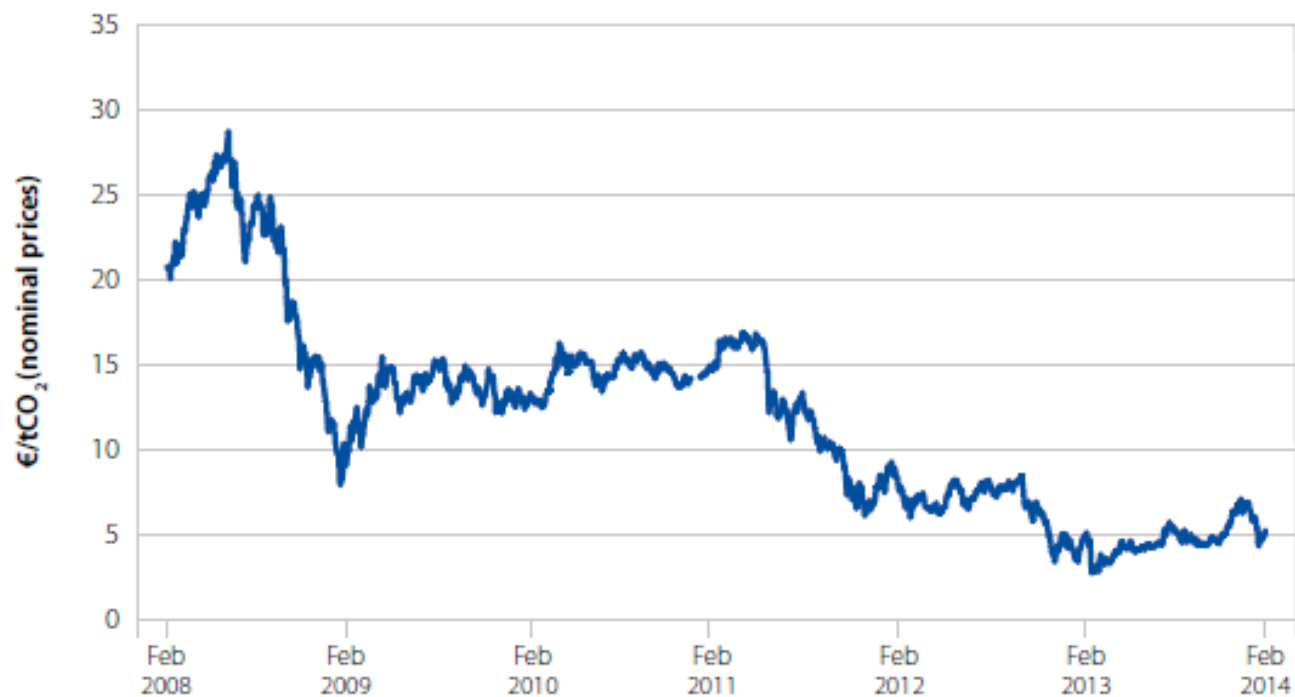
EUA Price: 28 €

CER Price: 20 €

in 2008

EUA: European Union Allowance in EU-ETS.  
CER: Certified Emission Reductions in CDM of Kyoto Protocol.

Figure 1.11: Carbon price in the EU ETS



Source: ICE.

Source: Committee on Climate Change (2014)