A Start on nonmarket valuation:

Valuation and Consumer’s Surplus, put simply

I use the term *individual*, to mean an individual member of some species, as in George Bush is an individual, and George the Gorilla is an individual.

(Economists are typically only interested in individuals that belong to the species *homo-sapiens*, but that need not be the case.)

For economists, value is anchored at the level of the individual: an individual associates different values with different things. It is a measure of “worth” that an individual attaches to a commodity, activity, or state of the world.¹

Put simply, if commodity A is valued more highly than commodity B, having A increases happiness more than having B would increase happiness. (Often we use the word *utility* as a substitute for happiness.)

Values, from the individual’s perspective, are *relative*. As in, “I value my friendship with Marc more than I value my friendship with Don.” Or “I would give up three apples to remain friends with Marc but only two apples to remain friends with Don.”

For economists, the values an individual associates with different commodities are expressions of that individual’s preferences.²

For economists, the value society places on a commodity is the sum of the values (positive and negative) placed on it by the individuals in that society.

(For economists, if the individual members of society do not value a commodity, the commodity has no social value.)

An important question then is which individuals count: whose values count. Economists typically limit counting individuals to humans, but there is nothing in economics that requires this. Note that many environmentalists, and some economists, believe that the

¹ Note the word “attach”. A red ball only has value because one or more individuals have attached value to it. Otherwise it would be without value.

² A person is an individual, my dog Sofie is an individual, a worm is an individual, and my house plant, Wilbur, is an individual, a distinct member of his species. An economist would probably say that an individual who has no preferences cannot value things: for such an individual, there are no values, nothing to count. To have preferences the ability to experience pain would be a minimum requirement.
preferences/values of non-human individuals (or at least some of them) should count towards social value. (Who should and should not count is an equity question.)

Note that many people define value differently from how economists define value.

For example, many environmentalists would argue that the earth has value independent of how individual humans value it.

Religious people would tell us that values are determined by the preferences of God, not the preferences of men.

Philosophers talk about whether things can have intrinsic value: value not assessed by some valuer—built in value.

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3 Note the distinction between (A) Edward the individual is a member of society whose values count directly in the social adding-up. Edward has a dog Sofie that whose happiness he cares about greatly. But, Sofie is not a member of society, so her values do not count directly in the social adding-up. And (B), Both Edward and Sofie are members of society, so both their preferences count directly in the social adding-up. Sofie’s welfare gets weight in both worlds, but in A) her preferences do not directly count; they count only because a member of society cares about her.

4 Its value “for its own sake”, or “in its own right.” As in, a tree has value for its own sake, not simply because individuals, who count, use it for shade or cut it down to help build a house. Tanya, a student, asked me “can intrinsic values be factored into economic analysis!” Good question. The more general question is whether intrinsic value can be incorporated into decision making—letting things have intrinsic value would, it seems, set economics on its head. How might it work? There would be two kinds of values: economic values, based on the preferences of individuals, and intrinsic values. The decision maker would want to add them together. This would require that they are all in the same units, probably dollars. I am comfortable with measuring people values in dollars because people have use for dollars, but less comfortable saying that a tree has an intrinsic value of $10? What would the tree do with $10? Nothing, but does that matter? Who would assign the intrinsic value? I guess an economist would say that to justify, on efficiency grounds, cutting down a tree, the net benefits, to humans, of cutting down the tree must be greater than the intrinsic value of the tree standing.

A start on non-market valuation: Edward Morey October 11, 2010
Economists typically value things in money.

- Could choose some other unit of value (ducks? in “Ducks we Trust”)
- Important thing is to value everything in the same units

The concept of value that economists typically use is called consumer’s surplus. I will define it in a moment.

Before I do, I need to make a distinction between market and nonmarket commodities.

- Market commodities are commodities that are bought and sold in the market place. Each individual takes the price of the commodity as given and chooses the quantity to purchase.

  Price is exogenous, quantity is endogenous.

  All the stuff available for purchase in the market place

  Most market commodities are congestible – what does that mean?

Write down the names of five things that are market commodities, and explain why they are market commodities.
Nonmarket commodities are commodities that are provided in some fixed quantity at a zero marginal cost to the individual(s) consuming it.

Examples include public goods, historical monuments, snow in the mountains, the weather, air-quality, how fat or skinny is George, etc.

What is a public good?

Nonmarket commodities might, or might not be, congestible. For example, national defense is a nonmarket commodity and a public good, so not congestible. But a common-property fishery is also a non-market commodity, and it is congestible.

What does congestible mean?

Write down the names of five things that are non-market commodities.

True false question: is Rocky Mt. National Park a market commodity or a non-market commodity?
Let’s start with market commodities and ask how one can identify an individual’s value for a market commodity.

Need to distinguish between
- Price
- Marginal value
- Total value
- Net value

Assume Ralph’s inverse-demand curve (note I put $ on the vertical axis) for ice cream cones is the simple linear function below. Assume the market price is $1.75 a cone. From the graph we see that at this price he chooses to consume 22 cones a year.

Ralph’s inverse demand function for ice-cream cones per year (“inverse” because money is on the vertical axis).

- Ralph’s inverse demand curve is his marginal value curve for additional cones. That is, it traces out his WTP (willingness-to-pay) for each additional cone. Estimating demand curves (inverse demand curves) is an exercise in valuation and preference estimation.
- Note that at around 25 cones, Ralph’s WTP for an additional cone is negative: the additional cone make him worse off, so he would have to be paid to consume it.
- If the price of cones is exogenous to Ralph, he will consume cones up to the point where price equals the value of the last cone to Ralph (his marginal value)

This will be true for not just Ralph, but for everyone.
If price is less than his marginal value, Ralph, or anyone for that matter, will buy more.

If price is greater than marginal value Ralph will buy fewer.

How much does Ralph value the 22\textsuperscript{nd} cone?

How much does Ralph value 22 cones a year? That is, what is the maximum he would pay for the 22 cones?

- Area under the inverse demand curve up to 22.

How much would he pay above and beyond what he currently pays? That is, what is the net benefit he receives from having ice cream cones available for sale at $1.75 each?

- What do we call this amount? Consumer’s surplus. It is the area below his inverse demand curve for cones and above the current price.

- This is his wtp above and beyond what he currently pays.

Can you figure out the dollar amount of the area?
Now consider an increase in the quality of ice-cream cones.

What happens to consumer’s surplus from cones if the price remains at $1.75?

How about if the temperature rises into the high 90’s?

What would likely happen to Ralph’s consumer’s surplus from cones if the price of a cone remains at $1.75, but he loses his job, so has less money.
Now consider the value to an individual for a nonmarket commodity.

Draw Ralph’s inverse demand curve for nonmarket commodity q.

q, for example, might be acres of Boulder official open space (measured in 100’s of acres)

Ralph’s inverse demand function for some non-market commodity, q

Assume 10 units (there are 1000 acres of open space) are being produced/supplied

What is his WTP to have 1000 acrs of open space available at a zero price in the amount of 10 units? It is the area under his inverse demand curve to the left of 10.

- In this case, how would you define marginal value? His WTP for another 100 acres (units increased from 10 to 11)
- Note that in this case total value equals net value

What an individual is willing to pay for something beyond what he currently pays is his or her consumer’s surplus

Would Ralph prefer Boulder with no open space or 1000 acres of open space at a cost to him of $6 per 100 acres? He prefers the open space at a cost of $60. Why?

If it cost him $9 to have open spaced increased from 1000 to 1100 acres, would he want this increase take place?

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What happens to Ralph’s consumer’s surplus from open space if its quality is degraded by pollution? If all of it is opened to mountain bikers, and Ralph hates mountain bikers?
Is consumer’s surplus WTP or WTA? And, what is the difference between the two.

WTP is willingness-to-pay
WTA is willingness-to-accept

Define in words your WTP to be cured of a deadly cancer. Define in words your WTA a deadly cancer.

Are they the same?

Do we have any pets in the room?

Meet Sofie, my dog.

I am going to cut her head off. I am weird. How much are you willing to pay me to save Sofie from decapitation? If I accept your offer, I won’t, ever, kill her. She will live out her life in dog bliss.
Alternatively, how much would I have to pay you (WTA) for you to let me cut off the head of your dog?

Much research suggests that you what you would pay to buy something (your WTP to acquire it) is less than what you would have to be paid to give it up, once acquired (your WTA its loss)

How people value things seems to depend, critically, on whether they “own” it. This is finding is somewhat problematic for economists
Under U.S. superfund law the polluter is responsible for the damages to the American people caused by the pollution where damage is defined as WTP for elimination of the damages.

Which is a better measure of damages WTP or WTA? WTA. Why?

WTA is how much you would have to be compensated to be made whole, after the loss.

We use WTP because it is easier to estimate.
So, a number of years ago I faced the following problem in a legal case. An Indian tribe had been injured, years ago; specifically it had been forced to leave the river basin where it had lived for hundreds of years and move to a reservation, with no river.

Put simply, the injury was the loss of their river-based culture

The economic question was how much the tribe was damaged in $ because of this injury? WTP would be how much the tribe, poor, would have paid in $—most of their exchanges were not in $—not to be relocated.

Their WTA would have been how much money they would have had to have been given to voluntarily move, give up their culture. Keep in mind that most of what they consumed and valued was not bought with money.

WTA would be hugemongus. WTP, in comparison, a trifle

Legally WTP is the correct measure of damages, but WTA is what would make them whole.

See also example about African tribe in book about place.