

Comments on Sugden, “Cost-Benefit Analysis as Market Simulation,” or Economics as if People Were Human Beings

Michael Hanemann

University of California, Berkeley

Presented at the Conference on
Frontiers of Environmental Economics
Washington DC, February 26-27 2007

- This is an excellent and well-written paper.
- It draws on and summarizes an impressive body of research recently conducted by Sugden and his colleagues.
- This research is clearly at the frontier of environmental economics.
- In fact, it has important implications for micro-economic policy analysis generally.
- It is very much in sync with the papers by Roe & Haab, Bernheim & Rangel, and Fiore, Harrison et al. Together these papers convey a common message.

A common theme

- There is growing evidence from behavioral economics, experimental economics, and elsewhere that the standard model of consumer decision-making provides an inadequate positive description of human behavior.
- Individuals make inconsistent, incoherent or unconsidered choices.
- We need a framework for welfare analysis that comes to terms with this basic fact.

Recommended Normative Approach

Guiding principle:

- Respect the choices that an individual would make for himself [Bernheim-Rangel]
- Respect the preferences that an individual would reveal at the moment of consumption [Sugden]
- Reject alternative criterion of “liberal paternalism”

Outline

- Summarize Sugden's argument
- Assess how convincing it is
- What does it leave out?

SUGDEN's ARGUMENT

- Economic analysis assumes that individuals have coherent preferences over all relevant outcomes. More specifically, preferences are assumed to be stable, context-independent, and internally consistent.
- For many years these assumptions were taken to be uncontroversial. .. But recent developments in experimental economics, behavioral economics, and stated-preference research has generated evidence which suggests that .. individuals do *not* have coherent preferences.

- The controlled nature of stated-preference (SP) elicitation is one reason why stated-preference research was one of the first areas of applied economics to confront the problem of ‘anomalies.’ ... However, it would be wrong to think of anomalies merely as artifacts of SP methods. It is now becoming clear that the psychological mechanisms that induce anomalies in stated-preference and laboratory experiments have significant impacts in many other areas of economics, including finance and industrial organization.

- The aim of the paper is to consider how economists can conduct welfare analysis and make policy recommendations if and when the assumption of preference coherence fails to hold.
- Starts with a question: Are there ways of characterizing the outcomes of market processes which don't assume preference coherence but which might still provide a basis for a normative defense of market outcomes?
- Answer is provided in Sudgen AER 2004.

- Models an exchange economy in which preference need not be coherent; from one moment to another no consistency of any kind is assumed. The only assumption is that, at any given moment, each individual is price-sensitive: if a good is offered for sale at two different prices at the same time, the consumer does not buy at the higher price.
- Shows that, in equilibrium, each good has a single price; all markets clear; each trader makes zero profit – just like a Walrasian equilibrium.
- What normative property does the equilibrium satisfy? Can't say this market is efficient at satisfying consumer's preferences, since coherent preferences may not exist.

- Shows that the equilibrium satisfies the **Opportunity Criterion**. If this is satisfied, every proposal for feasible change requires that at least one consumer's actual choice be overruled, and that he be given something he chose *not* to have in place of something that he chose to have. In equilibrium, all opportunities for mutually agreed exchanges are realized.
- This is analog of First Theorem of Welfare Economics – viz, in competitive equilibrium, no opportunities for Pareto improvement remain unrealized.
- This is compatible with the principle of *contractarianism*: Given different members of society with different viewpoints, each person makes his own judgments about what is good for him. The role of normative assessment is not to arrive at a unified conception of what is good for society, but to find fair terms on which these separate individuals can reach agreement about how their society should be arranged.

- In conventional CBA, efficiency can be achieved if decisions about the provision of public goods are made according to the Kaldor-Hicks compensation test.
- In Sugden's context, where coherent preferences are not assumed, the analogous criterion for optimality is based on the aggregate net surplus from consumption generated by the public good *as measured at the moment of consumption*. Hence, his principle of CBA as market simulation calls for an assessment of the aggregate valuation by consumers (beneficiaries) at the moment of consumption.

Two questions

- Does this principle of CBA as market simulation seem reasonable?
 - Yes
- Does it provide useful guidance for empirical measurement?
 - To some extent. But perhaps one could get a bit further if there were some understanding of what causes the anomalies to which he refers.

An Application of the Market Simulation Approach: (A thought-experiment)

- Object is to value air pollution damage caused by the construction of a new road.
- Two alternative measurement approaches:
 - 1) Hedonic price equation for home rental value as a function of exposure to pollution
 - 2) Contingent Valuation survey
- His assessment is as follows:

- In principle, a well-constructed price forecasting model, calibrated on evidence from similar housing markets, would generate reliable estimates of the hedonic price/pollution relationship for the policy option (build road) and do-nothing alternative. Such a forecasting model would typically be **direction-neutral**: the hedonic relationship for the two scenarios would not depend on which of them was given the 'do-nothing' label. The resulting estimate of aggregate net benefit to consumers plus property owners is direction-neutral.
- With CV, the valuation question might be framed in terms of WTP or WTA. The conventional economic theory of (reference-independent) preferences implies that any differences between the valuations elicited by WTA and WTP framings should be tiny. In practice, however, the WTA frame tends to elicit much higher valuations than the WTP frame. The CV approach is *not* direction-neutral. The best available explanation for this anomaly is that individuals' preferences are reference dependent.

- The hedonic pricing approach has washed out the direction-specific effects which appeared in the CV method. How can this be?
- The (assumed) direction-neutrality of the hedonic pricing method stems from the assumption that the price/pollution relationship in the housing market depends only on *current* causal factors; it is assumed to be unaffected by whether pollution was levels in the recent past were higher or lower than they are now.
- Is it credible to maintain this assumption while accepting the evidence of WTA/WTP disparities? Yes. The hedonic method elicits valuations *over time* – valuations are elicited as the benefits are experienced . CV elicits them as valuations at a single point in time (i.e., when the survey was administered). Thus the hedonic method takes account of endogenous changes in reference points over time, while CV does not (unless the respondent herself anticipates them).

- While reference-dependence of preferences sometimes does impinge on housing market transactions, the key point is that reference points eventually adapt to current circumstances. Thus, in market equilibrium, we would expect that most individuals' reference points approximately coincide with their actual consumption patterns.
- If the reference points adjust reasonably quickly to changes in an individual's circumstances, the hedonic pricing approach measures surplus at the moment of consumption. In contrast, CV measures surplus at the moment that the survey is administered. The hedonic pricing approach is thus more consistent with the principle of market simulation.

How convincing is this argument?

- With regard to CV: There is no doubt that it can be a difficult challenge to create a meaningful tradeoff for respondents, where they can visualize the outcomes in a realistic manner and respond thoughtfully.

How convincing? continued

- Offers a somewhat idealized account of the estimation of a hedonic price equation.
- Somewhat overstates ability to measure and include all relevant covariates, including attributes as perceived by buyers.
- Sugden assumes sole aim is to measure aggregate, marginal value, using marginal cost to measure marginal value.
 - Can't measure value for separate sub-groups
 - No non-marginal valuationThis tilts scale against CV.

Going beyond Sugden

- Sugden's does not ask whether there might be economic models that explain some of the anomalies to which he refers.
- His approach is to assume nothing about preferences except price sensitivity and show the existence of market equilibrium.
- But, for analyzing and predicting behavior, we would like, if possible, to have some understanding of what drives it.
- In fact, there are some economic models which can help with this.

Preference change

- Sugden highlights reference dependence, but this is part of the larger phenomenon of preference change.
 - You think you will really hate X but, once X happens, you get used to it. This may be because the reference point changed, but there are other forms of adaptation and acclimatization (hidden virtues discovered, the force of habit, etc)
 - Similarly addiction is an important form of preference change.

- The earlier economic literature von Weizsacker (1971), Pollak (1976) etc distinguished between short-run tastes, which are influenced by consumption in the previous period, and long-run preferences, and focused on the existence of an equilibrium, long-run demand.
- The newer literature (eg Kahneman and Sugden, 2005) shifts emphasis away from the possibility of an equilibrium. It stresses the continuing evolution of preference in response to experience and life events.

Which preferences to use?

- Preferences at the moment of choice (decision utility)
- Preferences when the outcome of the decision is experienced (experienced utility)
 - As immediately experienced
 - As synthesized in retrospect
- Sugden advocates preferences as immediately experienced.
 - Not clear to me that this is reflected in house purchase prices used for hedonic price function.

An alternative strategy:

- Rather than seeing preference change just as an argument for RP versus SP, consider possibility that it may have implications for *how one implements* them.
 - Study housing choices of experienced buyers rather than all buyers
 - With CV, survey those who have experienced the outcome rather than the general population

The nature of preference

- A lot of the discussion of anomalies is driven by auxiliary assumptions regarding:
 - What are “permissible” arguments in a utility function
 - What is the commodity space over which preferences are defined.
 - What is the nature of the consumer’s preference optimization
 - What it means to have preferences

- However, these auxiliary assumptions may simple be unfounded.
- In fact, there are economic models to be found in the literature that dispense with these assumptions.
- Such models potentially provide a useful economic framework for thinking about anomalies and coming to grips with them.

What is the commodity space?

[Commodities are defined relative to a context, and this can change. (Ebert and von dem Hagen 2002)]

dity space is given. However, one can observe the prices of goods and the quantities of goods bought, but one cannot observe ‘the commodity space’, i.e. the space of all commodities, in a very general sense, that are relevant for the consumer’s choice. Consider the well-known example of a person who never chooses the largest slice of cake offered but, say, always the second largest (see e.g. Sen, 1993). From three slices $\{a, b, c\}$ with sizes $a > b > c$ he would choose b while from $\{b, c\}$ he would choose c .¹ This is rational according to the choice rule stated and the same choice rule, representing the consumer’s taste, is applied in both cases. One way to resolve this dilemma is to assume that slice b from a choice set $\{b, c\}$ is not the same as slice b from a choice set $\{a, b, c\}$. If we denote

Attributes: The Lancaster-Maler model

- The utility function is $u=u(x,q)$ where
 - x is the quantities of individual commodities consumed,
 - q is attributes/characteristics of these commoditiesKey notion: the raw quantity of an item is not the only thing that matters to the consumer.
- This model has become the workhorse of modern theory of environmental economics

Lancaster-Maler model introduces a subjective element into preferences

- The attribute set: which are the attributes that the consumer considers salient?
- What matters is the consumer's subjective perception of the attributes he finds salient.
- There is also the possibility of non-attribute arguments of the utility function

Non-attribute arguments

- If a consumer cares about *what* she consumes, why might she also not care about *how* she consumes, including the process and circumstances.
- Not taking the last piece of cake, fitting in with the group, not wanting to be disrespectful of one's elders, doing the right thing, wanting to appear thoughtful or prudent, not wanting to overpay, not letting the other fellow get away with cutting in front of you in line – these are all attributes that a person could take into consideration when making a choice to eat a piece of cake.
- If so, they become arguments of the utility function in an expanded Lancaster-Maler model.

Some implications

- The q 's represent a potential source of inter-individual heterogeneity
- Also, a source of preference dynamics
 - Riker's concept of heresthetics: argument over which characteristics/issues are relevant to the issue at hand

A hypothesis: the coefficient on a given q is stable (sign does not change) but switching q 's on/off depending on context generates behavior variation.

Preference is a deeper structure, of which tastes are a particular manifestation

Context dependence

- Context dependence is a basic feature of human cognition. “Perception, like so many other psychological processes is quintessentially contextual. ... Context can affect processes at every stage: in early sensory transduction, in later perceptual encoding, in possible cognitive recoding, and in decision/response” (Marks and Algom, 1998)

- Swait, et al. “Context Dependence and Aggregation in Disaggregate Choice Analysis” *Marketing Letters*, 2002.
- Context is not necessarily noise that washes out in the aggregate; it can have a systematic impact on choice behavior.
- Present a conceptual framework and mathematical model to represent the sources of context-dependence in individual choice behavior.
- Argue for a shift in emphasis to mapping and measuring context dependence rather than assuming it away.

The nature of preference

- Underlying much of the discussion of preference anomalies is an outdated conception of mind. This is the “stored-rule” or “filing cabinet” concept of mind, which goes back to Hobbes, who conceived of cognition in terms of storing and retrieving “slightly faded copies of sensory experiences”.
- We now know from neuroscience that all cognition is a constructive process. People construct their memories, their attitudes, and their judgments. The real issue is not whether preferences are a construct, but whether they are a *stable* construct.

- Furthermore, stability has to be assessed in a probabilistic, not a deterministic, framework precisely because of the influence of affect and context on cognition.
- We know from the psychology literature that personality changes are rare, especially after the age of 30 (McCrae and Costa, 1990).
- The same may be somewhat true of preferences viewed as a deep structure.

- Economics is at a point where, having adopted a narrow and rigid concept of preferences, it is being forced to conclude that, as conceptualized thus, preferences do not exist.
- A preferable alternative is to redefine the concept based on the richer understanding we now have from neuroscience, behavioral economics, experimental economics, and stated-preference.

- Instead of writing preferences off, we need to take them seriously and come to grips with them.
- For this we need a new toolkit. Some of the tools will come from existing models in economics – RUM models, models of preference change, the Lancaster-Maler model – which have been underutilized. Needless to say, some of the tools will come from new advances based in part on approaches elucidated at this conference.