Valuing Food Safety and Nutrition

EDITED BY
Julie A. Caswell

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PART TWO: A Comparison of Valuation Methodologies

11. Thoughts About Different Methods to Value Food Safety and Nutrition

Ann Fisher

Food Marketing Policy Center
Department of Agricultural and Resource Economics
University of Connecticut

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The chapters in the Comparison of Valuation Methodologies section provide perspective on the strengths and potential drawbacks of several approaches. The reason for considering alternative approaches is that there are so few market data on people's values for food safety and nutrition. In her introductory chapter, van Ravenswaay mentioned three types of uses for valuation information:

- *Benefit assessment of policy proposals*, which includes identifying what goods would be produced by the policy, estimating the demand for those goods, and estimating the change in welfare that would result from changes in their supply.
- *Evaluating program effectiveness*, which covers the implementation process as well as whether the outcome is what was predicted for a given level of implementation.
- *Marketing research*, which includes (for example) estimating the demand for new products and predicting the effects of information programs.

Although there will be some overlap among users, the above types mesh well with the Roberts and Marks (Chapter 9) list of those who might want or need such information: *government, private individuals*, and *industry*.

Being explicit about what type of information is needed and who wants it are crucial for choosing among methodologies. The data and analysis should be appropriate for both the *scope* and *scale* of the problem being addressed. Before choosing an approach, the researcher should ask: "How important is it to know 'the real answer'?" Or, "How good do the estimates need to be?" Sometimes a quick-and-dirty method that is known to yield underestimates

clearly shows that a proposal's benefits outweigh its costs. Other times, a short-cut method that is known to overstate benefits yields estimates that fall far below a proposal's costs. In these cases, refining the results will not provide more information for the decision process; the first proposal is worth implementing and the second is not.

There are other cases, however, where preliminary (presumably, inexpensive and quick) data analysis does not yield a clear picture. Or, even though the first proposal discussed above clearly is worth doing, the decision maker might ask whether that proposed action is the best way to achieve the objective. In such cases the researcher should ask how much difference "better" results would make, and scale the valuation estimation effort accordingly. A major valuation effort is not justified for a low-cost program. But if the cost of making a mistake is large, then it is worth expending substantial effort on estimating the value of the additional food safety or nutrition that would be accomplished.

Once the researcher has answers to the above questions, it is time to examine available approaches. Table 11.1 is not intended as an easy checklist. But thinking about its rows and columns could help the researcher hone in on the problem to be addressed (the objective) as related to the pros and cons of alternative methods and data types, and what can be accomplished within the time frame and budget available for coming up with estimates that are "good enough." It also could guide someone reading a study, who is trying to determine whether that method or the results are relevant to a specific estimation issue.

Not all of Table 11.1's rows are relevant for all methods, of course. A primary distinction among valuation studies is whether they rely on secondary data or primary data. The left-hand columns in Table 11.1 rely on secondary data, with more primary data collection required for the right-hand columns. The more we know about the data for a particular study, the easier it is to find warts. Secondary data typically are preferred, mostly because economists have been trained to believe market data. However, available secondary data often were gathered for purposes quite different from issues related to valuing food safety and nutrition. For example, Roberts and Marks point out how little "hard" information was available from the Centers for Disease Control and Prevention on the rate of disease or on how many people required specific levels of treatment. It can be difficult or impossible for the interested reader or researcher to "get inside" the secondary data set and identify its warts. Secondary data sets do have the advantage of being less costly than primary data collection. Large surveys, such as those reported by Lin and Milon (Chapter 5) and by Halbrendt et al. (Chapter 7) are becoming increasingly expensive. Experiments involving actual risk tradeoffs, such as those reported by Fox et al. (Chapter 6), share an important advantage with secondary data: they are based on behavior rather than intentions. Like other primary data collection methods, experiments can be tailored for a specific purpose. So far, cost has limited their

TABLE 11.1 Criteria for Evaluating Valuation Methodologies

Criteria / Methodologies	Cost of Illness	Hedonic	Experi-mental	Conjoint Analysis	Contingent Valuation
Objectives					
Type of data: primary, secondary, or indirect					
Cost of data					
Sample					
Characteristics					
Response rate					
Coping with incompletes					
Tests for bias					
Corrections for bias					
Corrections for nonresponse or data gaps					
Framing effects					
Context					
Knowledge of product and its risk					
Characterization of risk					
Provision of risk information					
Link between risk reduction and WTP					
Payment mechanism					
Pretesting					
Preferences across alternative prevention/mitigation actions					
Why they gave specific responses					
Probing questions					
Exit interviews					
Cost of analysis					
Estimation methods					
Truncation					
Zeros, outliers					

use to tests of theory and illustrations of methodology, rather than to assessing values for representative samples.

Warts often become obvious to the researcher during primary data collection. Sometimes action can mitigate exogenous factors, such as the questions Lin and Milon added after their first wave of data collection, to account for whether respondents were aware of ABC's "20/20" program on shellfish safety. Similarly, Fox et al. removed the high and low bidders from all four experiments when they observed erratic behavior in one experiment. Reporting items listed in the rows of Table 11.1 makes it easier to identify shortcomings in the data set. For example, the Lin and Milon questionnaire varies the order in which shrimp, chicken, and oysters appear within similar questions. In a telephone interview, the respondent might not have listened carefully to the order for each question and have expected the order to remain the same. It might have been better to vary the order across respondents, rather than within the questionnaire for any one respondent. The information in their questionnaire might be too complex for respondents to make such fine distinctions reliably in a telephone interview; respondents need to understand that the total number of illnesses per year and their chance of illness from each food depends both on the risk per meal for that food and on how often it is eaten. Reports that provide details, such as in these examples, make it easier to find the warts, especially compared with studies using secondary data. It should be recognized, however, that this often is a function of more complete reporting, rather than necessarily reflecting more shortcomings in primary data.

Report writers and editors have not been committed to standardized reporting for any of these studies. Gaps in the reporting often make it impossible for the reader to determine what was done, and therefore, what strengths and shortcomings the estimates might have. In the absence of reporting standards, the rows of Table 11.1 might serve as a guide for what type of information is helpful for evaluating a study's estimates. Of course, any evaluation should be made in light of "how good" the researcher initially determined the results would need to be for the problem being addressed. That is why "Objectives" are listed as the first criterion in Table 11.1. Consider the Fox et al. study, in which the results are based on four experiments with 15 subjects in each. The results illustrate the potential usefulness of the laboratory approach, and suggest regional differences in willingness to pay for safer food. However, replication with samples including a wider representation of the population would be needed to make a case for government or industry action related to potential regional differences.

Any study can be conducted well or poorly. It is reasonable to expect, however, that studies using methods with a long track record are more likely to be conducted well. This is partly because the researcher can build upon the experiences of others to avoid pitfalls. It also reflects professional pride; the existence of many documented well-conducted studies makes it easier to identify

shortcomings in a poorly conducted study. Newer methods could be viewed with skepticism because of concerns that some potential pitfalls have not been identified yet, and because there are fewer well-conducted studies to serve as a benchmark. This suggests adding a row to Table 11.1, perhaps called "Maturity." The methods covered here that use secondary data have more maturity than those that require primary data.

So what is the bottom line? Each of these methods has its place. Which is most appropriate depends on the quality of the answer needed. For example, a study using secondary data might not report anything about the sample other than (say) its size. If its estimates for a cost per case of illness are ten times larger (or smaller) than the prevention costs, more refined reporting or collecting more representative data have no value for that decision. But suppose its cost-of-illness (COI) estimates are about the same as the prevention cost estimates. Then better reporting, using the criteria in Table 11.1, can reveal whether the COI really is about the same as the prevention cost, or whether a more representative sample would be needed to make that determination. Similar statements apply to reports based on primary data, of course. Particularly when respondents are not used to thinking about the commodity as a marketed good, such as reduced foodborne risks, the middle rows of Table 11.1 become more important. Cost of analysis and appropriateness of estimation methods apply to both primary and secondary data.

These valuation methods also can be complementary. For example, experiments can be a relatively fast, inexpensive way to develop, revise, and refine a survey (for contingent valuation or conjoint analysis) so that the researcher can be confident that it elicits the information needed.

In summary, the choice among valuation methods depends first on how accurate the results need to be. The choice between primary and secondary data depends on the cost of obtaining the data and the information available about the sample and people's understanding of the commodity and tradeoffs involved. Although some data limitations can be overcome by costlier analysis, the ultimate usefulness of the value estimates depends on reporting whatever caveats are appropriate for the decision maker's objectives. Table 11.1 can help researchers choose among valuation methods; it also can help others evaluate the usefulness of reported valuation studies.