

Chapter 1

Setting the Stage

1.1 Oil Spills and Valuation

When the tanker Exxon Valdez collided with Bligh Reef on March 24, 1989, it released 11 million gallons of oil into the pristine waters of Prince William Sound and subsequently induced a torrent of valuation studies on the economic damages of the spill. The potential magnitude of Exxon's liability unleashed a conflict between oil companies and resource trustees over measurement of these damages that has had a lasting influence on environmental valuation.¹ The conflict led to the investment of a vast quantity of resources in valuation methods by both sides. In the struggle to establish the magnitude of economic damages something of greater significance emerged: a universal admission that resource damages represent real losses to people. Although defendants challenged the use of stated choice methods in measuring '*non-use*' values associated with toxic spills, both plaintiffs and defendants accepted the concept of measuring damages for injury to public resources by the amount of compensation individuals in society would need in order to restore their well-being. This acceptance, characteristic of both the Exxon Valdez oil spill and other important but less spectacular cases, implicitly ratified the economic model of individual choices as the basis for economic value.

The willingness to use economic principles to establish the economic damages from the Exxon Valdez oil spill is part of the steady growth in the application of economics to public resource allocation. Whether the goal is to estimate the economic damages from injury to natural resources or to assess government

¹Exxon eventually settled with the state of Alaska for damages of about \$3 billion. Details of the oil spill and the settlement can be found on the website <http://www.evostc.state.ak.us/>.

regulatory analysis, economists cannot proceed without knowing the benefits and costs. Benefit-cost analysis has been applied to the evaluation of an astonishingly wide spectrum of issues. These include childhood reading programs, transport facility design, prevention of recidivism among convicted felons, a wide variety of health care initiatives and the measurement of the benefits of pollution reduction which is the chief concern of this book. The demand for good benefit estimates for non-marketed goods seems insatiable.

Two basic approaches to valuation have emerged: methods based on questioning that directly elicits the values that economists seek and methods based on observing behavior from which economists can deduce these values. In the development of benefit measures, the earliest methods were crude examples of the latter approach. Economists believed fervently that the only reliable evidence about how much a person would pay for a good or service would come from a situation where the person actually paid.² This belief has proved difficult to live by. Often benefit-cost analysis requires valuing services that have never been purchased nor are related in any way to observable behavior, making the revelation of values based on behavioral decisions impossible.

In the struggle over the size of the damages from the Exxon Valdez oil spill, both the plaintiffs and the defendants invested large sums of money in research on valuation techniques, but the focus of the research was rather narrow. Essentially the chief question was whether researchers could infer ‘*non-use*’ values, the economic losses from injury to resources in their natural state that people would never experience directly. The nature of this valuation task required researchers to use direct interview techniques—stated preferences—rather than rely on observations of behavior. Consequently, most of the research focused on stated preference techniques, leading to substantial advances in the approach.

In this research environment, revealed preference approaches were relatively neglected. Compared with stated preference, revealed preference approaches seem unwieldy, not nearly as accessible or satisfying as a simple graph of consumer surplus would suggest. When one admits errors of measurement or specification, even the simplest of revealed preference applications seems fraught with difficulty. But experience has taught us that good stated preference analysis may be no less challenging. Meeting the NOAA panel recommendations (Arrow *et al.*, 1993) is no easy task. Both revealed and stated preference analyses pose difficulties, and while some valuation problems simply

²This attitude was equally true for firm behavior and is best represented by Friedman (1953) who argued that comparing the implications of models is a better methodological approach than interviewing businesses to get them to reveal how they made decisions—in particular whether they are maximizing profits. It may be true that competition in the asset market will force firms to maximize profits. Nothing, however, prevents households from behaving irrationally.