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Cost-Benefit Analysis: Why Relative Economic Position Does Not Matter

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Abstract

The current debate over cost-benefit concerns in agencies' evaluations of government regulations is not so much whether to consider costs and benefits at all but rather what belongs in the estimated costs and benefits themselves. Overlaid is the long-standing concern that the distribution of costs and benefits needs some consideration in policy evaluations. In a recent article in the *University of Chicago Law Review*, Robert Frank and Cass Sunstein proposed a relatively simple method for adding distributional concerns to policy evaluation that enlarges the typically constructed estimates of the individual's willingness to pay for safer jobs or safer products. We show that when considering the core of the Frank and Sunstein proposal carefully one concludes that current regulatory evaluations should be left alone because there is no reason to believe that relative positional effects are important either to personal decisions in general or to currently constructed cost-benefit calculations of government regulations in particular. We argue that the most important refinements one could make in the area of regulatory evaluation would be for agencies involved to adhere more to the framework of what is generally considered a carefully done cost-benefit study, and for agencies to make greater actual use of appropriately done cost-benefit studies when recommending regulations.

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A Cost-Benefit Analysis: Why Relative Economic Position Does Not Matter

An exciting recent development in cost-benefit evaluation of policy is the issuance of so-called prompt letters by the Office of Information and Regulatory Affairs (OIRA) of the Office of Management and Budget (Hahn and Sunstein 2001). OIRA's prompt letters, which are made public, have openly encouraged agencies such as the Food and Drug Administration and the Occupational Safety and Health Administration to explore specifically named regulations that OIRA believes may be cost beneficial, such as possibly requiring automatic external defibrillators in the workplace. Whether prompt letters and other efforts to reform the regulatory process will be successful depends ultimately on how one values the benefits and costs of the regulations. Frank and Sunstein (2001) propose that benefit estimates used to value lives in regulatory studies, such as the ones OIRA seeks to promulgate, be increased. Their rationale for enlarging benefit calculations is that, as currently constructed, benefit estimates do not account for the role of people's concern over relative economic position in society. We argue against replacing the current approach to valuing risks to life and health because there is little evidence that relative position is important to individual decisions and even if it were policy decisions involving cost-benefit calculations would not change.

In the absence of explicit legislative prohibition, a comparison of costs to outcomes coupled with economic balancing is now the default standard when formulating a new government regulation (Sunstein 2000). Cost-outcome balancing means weighing the policy's benefits and costs. Although studies of programs' costs and outcomes have

been deservedly criticized for lack of completeness, Executive Order 12866 makes agencies provide a regulatory impact evaluation if a rule or regulation may "have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities." (Hahn et al. 2000). Similar intent that costs and outcomes be considered explicitly appears in the Unfunded Mandates Act of 1995. In what may have a dampening effect on cost and benefit comparisons in decision making, at least in the private sector, juries seem to punish private sector firms that try to balance costs and benefits of harm to customer or worker health when making production decisions prior to accidents and ultimate tort suits (Viscusi 2001). Still, where government regulations are concerned, no longer is the debate mostly over whether to consider costs and benefits but rather more over what belongs in the cost and benefit columns.[1]

Frank and Sunstein offer a simple solution to the thorny issue of how to incorporate non-uniform net benefits across initially advantaged versus disadvantaged groups when calculating net benefits of a regulation. We argue that there are conceptual and practical flaws to the modest proposal of Frank and Sunstein so that producers and users of studies of regulatory cost and outcomes should not adopt their idea. Rather, we should retain the current approach of using absolute benefit values rather than benefit values adjusted for relative economic position.

[1] For a brief and readable discussion see Kniesner 1997.

Current Practice

As currently practiced, analysis of the benefits of risk reduction typically relies on multivariate statistical estimates of what a worker is implicitly willing to accept to incur risks on the jot or what a consumer is implicitly willing to pay for a safer product. Estimates of such risk-money tradeoffs underlie the estimated benefits of saving a statistical life, known either as the implicit value of life or the value of a statistical life. These concerns also underlie the estimated benefits of preventing certain non-fatal injuries, sometimes referred to as the implicit value of harm. Government regulations mandating greater safety will lower wages and raise product prices so that the ultimate costs of the safety enhancements are paid for by the end users of the safety, workers and consumers. The change in wages or prices then reveals the value of a regulation-induced safety enhancement to compare to cost calculations in a cost-benefit analysis.

The standard procedure, then, used to calculate benefit values for a government program is the amount society is willing to pay for the program's benefits. In the case of risk regulation the reference point is our willingness to pay for the risk reduction that was achieved by the regulation. In the case of policies that save lives the question is not how much people are willing to pay for the particular outcomes in terms of actual lives saved, but how much people are willing to pay for reductions in the risk to life for a much broader population group.

To establish meaningful values for the tradeoffs people are willing to make between risk and money, economists have focused on choices people make in the marketplace. A chief source of information has been estimates from the labor market. Using large data sets on worker behavior, one can estimate the incremental wages

workers receive in return for facing added risk, controlling for other aspects of the worker's job. The wage increment approach yields an implicit value of life in the range of $3 million to $7 million for most studies in the literature.[2] For the sake of convenience, we will take a midpoint value of about $5 million as indicating an appropriate value of a statistical life based on market wage-risk tradeoffs. So, if workers faced an annual job fatality risk of one chance in 10,000, an implicit value of life of $5 million implies that each worker would require an extra $500 to face the added 1/10,000 risk of death. Put somewhat differently, if there were 10,000 workers affected, each of whom faced a job risk of one chance in 10,000, then there would be one expected statistical death to the group. In return for facing the 1/10,000 risk there would be an extra wage premium of $500 for each of the 10,000 workers, or a total of $5 million more paid in wages. Implicitly, the group of workers are willing to exchange total compensation of $5 million to accept the extra risk of one statistical death to their group, which gives rise to the value of a statistical life of $5 million. We will refer to estimates of extra group compensation as absolute value of life figures.

Practitioners of cost-benefit analysis have assembled several panels of experts to make recommendations for what a well-formulated cost-benefit comparison should contain in the areas of the environment, health, and medicine with the goal of increasing realism and transparency of calculations and decisions to be drawn (Gold et al. 1996; Arrow et al. 1996). A common concern for cost-benefit analysis is that distribution of costs and benefits by, say, income or race should not be ignored when reporting and applying cost-benefit analysis. If two policies have the same total costs and total benefits one might argue on equity grounds that the policy that does more for the poor should be

[2] For a review of the evidence, see Viscusi 1998, especially Table 4.2.

preferred. However, addressing issues of distribution more generally are controversial and can be used carelessly or strategically (Viscusi 2000b).

A stumbling block in applying adjustments for distributional considerations has been how to do it in practice while maintaining the well-known objective of KISS (Keep It Sophisticatedly Simple). Frank and Sunstein present a clearly argued KISS-based proposal for incorporating income distribution consequences of health and safety regulations into ultimate decisions based on policy analyses. We contend that conceptual and practical flaws that we will identify should make practitioners of cost-benefit analysis justifiably unmoved by the refinements offered by Frank and Sunstein.

The Frank and Sunstein Refinement to Policy Evaluation Current Practice

Frank and Sunstein (2001) propose that economists, lawyers, and policymakers not use typical absolute value of life figures but instead use value of life figures that consider persons' relative economic positions. Frank and Sunstein contend that people are on "a positional treadmill" in which they accept extra pay for job risks in an effort to achieve relative economic (income/consumption) status. In their view the standard estimates used in the federal government of a value of life of about $4 million should be increased. Their stated rationale for boosting estimated values of life is as follows:

> The essential reason for our claim is that people care a great deal about their *relative* economic position, and not solely, and often not mostly, about their *absolute* economic position. Current estimates tell us what an individual, acting in isolation, would be willing to pay for, say, an increase in safety on the job. But when an individual buys additional safety in isolation, he experiences not only an absolute decline in the amounts of other goods and services he can buy, but also a decline in his relative living standards. In contrast, when a regulation requires *all* workers to purchase additional safety, each worker gives up the same amount of other goods, so no worker experiences a decline in relative living standards. If

> relative living standards matter, then an individual will value an across-the-board increase in safety more highly than an increase in safety that he alone purchases.[3]

Frank and Sunstein maintain that a worker's concern over relative economic position means that, as currently calculated, market wage-risk tradeoffs understate the implicit value of life. So, if the government now uses $4 million as the average value of life, in their view additional concerns over workers' relative positions should increase the appropriate amount to a range from $4.7 million to $7 million.[4] For the $5 million reference point that we indicate above, the value-of-life range would be from $5.9 million to $8.8 million. Thus, the main effect of their procedure would be to boost the estimated average value of life used in benefit assessment by 18% to75% over what is currently used.

The main, and surely controversial, innovation to cost-benefit analysis argued for by Frank and Sunstein is a contention that persons care not only about the other things they can buy besides safety, but also about how their consumption of other things or income compares to the income and consumption of others in society. Frank and Sunstein believe that not only does my personal sense of well-being depend on my own income but that it also depends on where I am located in the income pecking order of whatever demographic barnyard I think I belong to emotionally. In Frank and Sunstein's view of regulatory evaluation, greater mandated safety has attached to it the additional cost of moving down the income distribution, and conventional estimates of willingness to pay incorporate the individual's cost of having more safety from being made worse off in a relative residual income sense.

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[3] See Frank and Sunstein at p. 326; accompanying footnote omitted.
[4] See Frank and Sunstein at p. 323.

Frank and Sunstein conclude that conventional cost-benefit analysis undervalues health and safety regulation because the benefits are understated. Because a regulation makes everyone in the relevant group consume more safety and suffer similar wage reductions and price increases, there is no change in anyone's relative economic position from a widespread regulation. According to Frank and Sunstein, conventional benefit calculations that use risk-money tradeoff estimates are too low, and in turn cost-benefit analysis calculations too economically pessimistic about society's gain from the regulation, because conventional estimates of the value of life are individualistic and net out the person's private loss from moving down the income distribution. Their bottom line is to argue that conventionally calculated value of life estimates should be increased when deciding whether to adopt a regulation that would save statistical lives. The obvious practical consequence of what Frank and Sunstein contend is that some regulations that are currently viewed as not worthwhile may be considered cost effective.

Conceptual Issues and Contradictory Evidence

In many cases the devil is in the details. Here the devil is in what Frank and Sunstein leave out of the details. The standard economic approach to understanding a person's or a firm's decisions is symmetric in the sense that price is compared to the economic value of a good or service. Frank and Sunstein want an asymmetry where there is a second cost of safety if one buys it in isolation, which is less purchasing power for other things than before compared to the others in a person's reference group. Residual income has a so-called positional effect in that the person implicitly buying the safety would also pay an additional amount not to have an associated decline in relative command over other things such as clothing or pleasure travel. The amount one would

pay to avoid moving down the consumption ladder would then be added into any social calculation of the benefits of a safety-enhancing regulation that is applied universally.

Consumption can surely be a status symbol, and Frank and Sunstein are correct in suggesting that higher income confers greater economic status. However, there are other attributes associated with a job that may be consequential as well. Perhaps most pertinent here is that being in good health is a highly valued attribute. People may simply have a preference for safer jobs because safe jobs protect individual health.

We find the Frank and Sunstein willingness to make residual income (non-safety consumption) positional in isolation somewhat odd. If I care about my relative income should I also not care about my relative health and safety?[5] Frank and Sunstein argue that workers know their relative income position but do not know their relative safety position at work (p. 351). At the risk of sounding like the cartoon sociologist to whom two anecdotes are a large data set and one anecdote is a small data set, a brief story is in order. One of us once worked during the summer in a chemical plant. Everyone in the plant knew that working in the acid production department was much more dangerous than working in the sodium production department. Most butchers we have met have part of at least one finger missing and most roofers we have met have a broken back of varying degrees of severity. One need not have the same reference group for safety as for residual consumption either.[6] Workers do know their relative workplace safety, so it is difficult to accept safety in the workplace as a totally non-positional good.

We contend that if income remaining after one implicitly purchases more safety or health affects the feeling of well-being indirectly via the relative ability to purchase

[5] For additional theoretical discussion of offsetting positional effects see Besharov 2001.
[6] For additional theoretical discussion of multiple reference groups also see Besharov 2001.

fewer other things, then a regulation also makes one better off because the additional safety or health is not only absolute but also relative to a reference group. Safety or health may also be positional so that I get additional well-being from being safer than my neighbors or colleagues. If it seems reasonable for one to care about how his or her consumption of non-safety things compares to the consumption of others, then it also seems reasonable that one should care about how his or her consumption of safety and health compares to others' safety and health. The two positional effects may then simply cancel. The supplemental welfare effect of moving up the safety ladder can cancel the supplemental welfare effect of moving down the consumption of all other things ladder, and we are back to the familiar case where only the absolute levels of safety and residual income come into play.

One source of evidence regarding countervailing positional effects where health is concerned is revealed by the relationship between income and the desire for health insurance. As people get richer, do they have greater desire to purchase health insurance to protect their health? The evidence here is quite strong. Economic estimates suggest that as one's income increases by some percentage, the demand for health insurance also increases but at roughly half that rate.[7] The observed relationship between income and the desire to protect one's health suggests to us that workers are concerned not only with their income position but also with their health position in society.

An even more direct piece of evidence on countervailing health positional considerations pertains to how people's attitudes toward bearing risks on the job vary with their income level. Consider the following evidence on chemical workers attitude toward facing greater risks of job injury. For chemical workers the main matter of interest

is not the implicit value of life but rather the implicit value of a job injury as reflected in the tradeoff workers are willing to make between higher pay and greater risks of injury from the job. Evidence for chemical workers indicates that the implicit value of a job injury increases quite strongly with one's income. Thus, a 10% increase in income would boost the value attached to avoiding a job injury from 6.7% to 11%.[8] A higher income enables one to avoid the risky jobs, which quite simply are not that attractive, and means that people seem to show a willingness to tradeoff income position again an improved health position.

The undesirability of hazardous work is also reflected in who takes such jobs. Are the most dangerous jobs in the firm the most sought after positions that workers compete for in an effort to boost their economic status relative to their peers? That dangerous jobs are sought after because they allow relatively high consumption of goods and services is the story line that would offer much support for the Frank and Sunstein perspective that workers try to boost their economic status through hazardous work. In practice, what we observe is opposite the basic Frank and Sunstein proposition. Risky jobs tend to be staffed in large part by new hires who tend to have very little job experience.[9] Indeed, as many as one-third of all manufacturing quits may be due to the influence of job hazards on worker quitting.[10] Rather than workers seeking out risky positions, new workers fill hazardous jobs that tend to be primarily entry level and are jobs that workers quit quickly so as to avoid facing the attendant health risks. The rapid flight of workers from the risky entry level jobs is consistent with our empirical observation that hazardous jobs tend to

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[7] See, for example, Newhouse and Phelps 1976.
[8] This evidence is based on the evidence on page 369 of Viscusi and Evans 1990.
[9] See Viscusi 1979.
[10] Ibid. See also Viscusi 1983.

be among the least attractive positions in any enterprise. They also tend to be smelly, dirty, and undesirable jobs in other respects as well. Risky jobs are not the treasured targets of opportunity for upward mobility that Frank and Sunstein envision.

To be fair, Frank and Sunstein mention the possibility of safety and health being positional goods too, although they claim the positionality of health and safety is less than the positionality of residual income (p. 351). Frank and Sunstein also consider implications of a situation where safety or health is partly positional, but not as positional as residual consumption.[11] In particular, Frank and Sunstein consider the situation where the positional effect of residual consumption is half offset by the positional impact of safety (p. 355). Does it matter whether safety and health are partly versus totally non-positional to the practice and use of cost-benefit analysis? Does the core of their argument affect what is "good enough for government work?" Soon we will demonstrate that "where the rubber hits the road" in the practice of cost-benefit analysis, nothing will change because of the refinements Frank and Sunstein propose.

Finally, although Frank and Sunstein mention the phenomenon of loss aversion, they do not explore fully how it weakens the argument for a possible role of relative position effects in benefit assessment.[12] To elaborate, loss aversion can alter how we view the role of job risks. If people are in reality quite averse to incurring substantial losses in income, then it will have tremendous consequences for the attractiveness of hazardous jobs. If one is maimed or killed on the job, either the worker or the worker's survivors will experience a substantial drop in income. Because hazardous jobs are intrinsically linked to the prospect of substantial losses, it is unclear that a worker will

[11] For more analysis of the size of positional (externality) effects see Besharov 2001.

gain relative social status through work on dangerous-high wage jobs. The key aspect is that a job is a bundled commodity that includes income consequences, adverse health consequences, and potentially unattractive non-pecuniary losses. Given an undesirable mix of attributes along with the higher wage premium for the job, will working on a dangerous job in fact confer the kind of social climbing effects that Frank and Sunstein envision?

Evidence of Relative Position's Importance?

Getting a handle on how people value their relative position with respect to others is a difficult empirical task. There is much multivariate statistical evidence that people's economic behavior depends little on peer or reference group behavior (Moffitt 2001, Brock and Durlauf 2001). Frank and Sunstein present a variety of suggestive evidence, but the character of their evidence tends to be less compelling than that for market values of wage-risk tradeoffs. It is also less concrete than our contradictory evidence presented above, which is based on actual market behavior rather than thought experiments and general surveys of people's happiness.

One type of evidence they present pertains to various types of thought experiments. For example, would you rather live in World A where you earned $110,000 per year while others earned $200,000, or would you rather live in World B where you earned $100,000 per year while others earned $85,000? The subjects in their positional income thought experiment are also told that the income figures represent real purchasing power. About half their experimental subjects, which include University of Chicago Law School students, say that they would prefer the World B situation with higher relative

[12] See page 340 of Frank and Sunstein as they discuss loss aversion with respect to how people must pay

income. Frank and Sunstein interpret the slight majority favoring World B as evidence of the importance of relative position. An even more plausible interpretation of the subjects' conjectures is that experimental situations premised on an economic falsehood will not be taken at face value by respondents. People will realize that in World A, where they earn just under half of what everybody earns, the prices of goods and services will be bid up and they will be less well off than if their earnings are greater than everyone else's. Including the disclaimer that income figures represent real purchasing power does not overcome the underlying difficulty that the disclaimer is an economic falsehood. The equal purchasing power disclaimer will not be fully credible to experimental student subjects who realize the importance of their income within the context of the income of other people in giving them access to goods and services in our economy.

A second kind of evidence Frank and Sunstein muster pertains to happiness surveys. Researchers have found that when you ask people whether they are "very happy," "fairly happy," or "not happy" their answers are strongly correlated with their relative income within the country.[13] How should one answer a categorical happiness question when it is posed? One cannot resort to a thermometer or a weight scale to obtain an objective reading. Categorical happiness questions are by their nature answered within their social context. The same kinds of research as discussed by Frank and Sunstein indicate that the distribution of responses to categorical happiness questions tends to be unaffected by changes in overall levels of income over time. The phenomenon of no income-level effect is also consistent with the relative character of the question. If one asked a person in the late 1800s to assess personal happiness, the person might have

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for regulation.

[13] See pages 337–338 of Frank and Sunstein.

indicated that he or she is very happy if there is a good functioning well and an outhouse in close proximity. However, having the two amenities from the year 1800 today would probably not make one feel "very happy."

In much the same way, studies regarding what budget is needed to obtain some minimum comfort level or "to get along in this community" are also likely to be influenced by the current standard of living.[14] People's life expectancy was less 50 or 100 years ago, and many of the products we now purchase on a mass scale, such as a telephone or a television, were formerly restricted to a narrow band of relatively wealthy consumers. What we need "to get along in this community" necessarily changes with the community's standard of living. Relative questions will necessarily generate relative answers, but they do not bolster the Frank and Sunstein core proposition. Answers to questions about relative income or consumption simply do not constitute a valid test of the importance of relative positional effects in willingness to pay calculations.

The linchpin of the Frank and Sunstein insights on policy evaluation of workplace safety regulation is that workers seek a positional status benefit by accepting dangerous jobs, which confer higher income. How much higher income? Suppose we use as a starting point a value of life estimate of $5 million, which exceeds the $4 million figure Frank and Sunstein use as their baseline. The average worker in the U.S. economy faces an annual death risk on the order of one chance in 20,000.[15] With a value of life of $5 million and a risk of one chance in 20,000, the average worker exposed to such a risk will receive supplemental annual compensation of 1/20,000 × $5 million = $250 a year, which is roughly $5 extra gross earnings per week. Working on a dangerous job may enable you

[14] These examples are from page 353 of Frank and Sunstein.
[15] See page 46 of the National Safety Council 2000.

to buy an extra value meal every week at McDonalds but will not buy a Rolex watch, a BMW, or any of the other status symbols that one can flaunt to demonstrate one's higher economic status. The point is that one does not buy much extra relative consumption for accepting a job that is two or three times more dangerous than the average job.

Finally, the Frank and Sunstein maintained proposition, that positional effects are important to evaluating willingness to pay and attendant regulatory benefits, is flawed with respect to their attribution of the relevant reference group. As is indicated by the quote above, Frank and Sunstein believe that if all workers are required to purchase additional safety, then there will not be a positional effect. Only when an individual worker must have greater job safety is relative position consequential, so that regulatory policies will supposedly not be subject to the positional evaluation bias that affects market tradeoffs. However, safety policies in the United States are not financed by general revenues in which costs are spread across the entire society. If there is a government regulation of, for example, the risks of explosion in a grain elevator, then the regulation will boost the costs to the firm and will be borne, at least in part, by other workers at the firm because the regulation can raise the price of the product and reduce sales and the firm's subsequent demand for workers. The neighbors of the grain elevator workers who perhaps work for a construction firm or the highway department will not be affected by the costs of the grain elevator safety regulation. Only the grain elevator's workers will incur the major share of the regulatory costs. In the case of the typical regulation just described there will still be the economic status effects that concern Frank and Sunstein. Only when everybody in society shares in a regulation's cost will there be no positional reshuffling. How a regulation's cost must be shared for there not to be a

positional effect is unclear. We do not know whether it is the absolute cost amount that should be equalized across people or whether it should be a proportional effect on their income, or some other formula in order to ensure positional neutrality.[16]

It Will Not Matter Anyway

Let us come at the issue of positionality in cost-benefit analysis from the perspective of persons outside the Ivory Tower who use and defend cost-effectiveness calculations. Frank and Sunstein contend that income position matters in addition to income level where individual well-being is calculated and then linked to safety. They suggest a 50 per cent add factor on the value of life estimates currently in play. A second anecdote is in order. One of us spent a year in the private sector doing cost-effectiveness studies in a major drug company where there is much financial incentive to discover defensible arguments for increasing the benefits of a health enhancing pharmacotherapy. Even in an environment as profit-oriented as a drug company it would be impossible to use made-up examples of Smith and Jones (pp. 348–351) and introspection (pp. 352–353) to convince senior managers that the company could justify increasing the benefit of the intervention by half. No one on the cost-benefit analysis firing line is going to cite thought experiments or a comparison of pay and performance in three selected occupations (pp. 361–363) as justification for changing benefit calculations as typically

[16] An additional complexity is that the individual's reference group cannot be uniquely identified in econometric models of individual outcomes (Manski 1993, Moffitt 2001). The reason is that possible reference groups are nested inside each other. Suppose that we consider the effects of others' incomes on my behavior and that my true reference group is only my neighbor living in the house to the east. The researcher cannot know that only the income of one neighbor enters my decisions, so that a statistical model incorrectly attributing my reference group as all the houses on my block will find that the average income on my block is statistically significant to my behavior because incomes are positively correlated across houses nearby.

done. Multivariate statistical evidence of the extent of any positional effects in income will be needed.

The only study of even tangential relevance available on possible welfare effects of relative income position is a Dutch study by van de Stadt, Kapteyn, and van de Geer (1985) that Frank and Sunstein discuss (pp. 353–355). Without commenting on the quality of the statistical model or the generalizability of the results, let us simply note that Frank and Sunstein interpret the results of the Dutch data as indicating that a 33 percent increase in willingness to pay is implied because a person would feel indifferent between the current situation and one in which he or she got a 33 percent increase in income while everyone else of importance to the individual got a 100 percent increase in income. The implication is that someone who would pay $1.00 for additional safety when consuming it alone via a $1 higher product price or $1 lower wage would also pay $1.33 if everyone else were regulated to consume the extra safety so that there is no relative decline in one's residual consumption. If safety is partly, but not totally positional too, then the add factor is perhaps half of the 33 percent or 17 percent. In our judgment the best estimate Frank and Sunstein could offer is to increase values attached to the benefits of risk reduction by 17 to 33 percent in currently calculated cost-benefit analyses. It does not matter for evaluating a regulation's cost effectiveness whether one increases regulatory benefits, as usually computed, by 17, 33, or even 50 percent. Bumping up the benefits by the amounts suggested by Frank and Sunstein will not change how benefit estimates enter currently conducted regulatory evaluations.

Users of statistical results concerning human behavior usually consider not only the estimated average outcome but also a range of possible outcomes based on theoretical

considerations or on the expected precision of the estimated average outcome (Krantz 1999). Incorporating the statistical accuracy of an estimate means that policy evaluations regularly consider a range of outcomes rather than just the best single estimate of the outcome. An obvious way to create a range of benefits for a regulation, for example, is to create a pessimistic outcome that is the estimated average benefit of the regulation minus 2 or 3 times the measured imprecision in the estimated average benefit (standard error) and an optimistic outcome that is the estimated average benefit plus 2 or 3 times the measure of imprecision in the average.[17]

Now suppose we consider a well-known estimate of the value of a statistical life as it applies to job safety and its associated measure of imprecision (Thaler and Rosen 1975) to form a pessimistic-optimistic interval for the value of life, as is currently typical when doing cost-benefit analysis. Using Thaler and Rosen's four basic sets of results we find an implied willingness to pay for workplace safety range that is the average minus 80–240 percent and the average plus 80–240 percent. Note that the smallest optimistic outcome for willingness to pay that a policy analyst would routinely consider when applying Thaler and Rosen's estimate is the average plus 80 percent, which is a 2.4 times greater adjustment than the Frank and Sunstein back-of-the envelope calculation of how current practice supposedly underestimates the value of life by ignoring distributional issues (33 percent). Even if the estimated average value of life is, say, five times as large as its standard error, a policy analyst would typically consider the average plus 60 percent, which is almost double the add factor Frank and Sunstein offer. The point is that current practice already allows for imprecision of the average value of life estimate that is

[17] For discussion of the related, but not identical, issue of how to allow for uncertainty in estimation of cost-benefit ratios see Manning, Fryback, and Weinstein 1996.

much larger than the amount of imprecision in willingness to pay that Frank and Sunstein claim to have identified.[18] (However, Hahn et al. 2000 report, disappointingly, that despite Executive Order 12866 to the contrary, only 13 percent of the major health, safety, and environmental regulations from mid-1996 to mid-1999 had as part of the relevant agency's regulatory impact analysis both a best estimate and range of costs.)

Another useful measure of the extent to which the Frank and Sunstein approach might make a difference in policy evaluation comes from examining regulations that would pass a cutoff of benefits being greater than costs if one applied the Frank and Sunstein 33 percent add factor to benefits. For the sake of concreteness, let us rely on the cost per life saved table compiled by the U.S. Office of Management and Budget (OMB) and reported in a book by Justice Stephen Breyer.[19] In his book, Breyer summarizes the cost per life saved for 53 different government policies. Now take the reference point value of $4 million per statistical life saved, which Frank and Sunstein take as the current applied government standard when evaluating regulations. So, policies with a cost per life saved less than $4 million would pass the benefit-cost test, and policies with a cost per life saved greater than $4 million would fail the benefit-cost test. What if we were to raise the value of life to $4.7 million, which is the most conservative add factor Frank and Sunstein discuss? Upping the benefit per statistical life saved by $0.7 million means that the benefit per life saved for various regulatory policies in the OMB tally jump from $3.4 million per life for the benzene NESHAP regulation (original: fugitive emissions) to $5.7

[18] Of course, the estimated average WTP and its associated measure of precision we are discussing might change if computed from a model that incorporated additional variables representing the social/group effects that concern Frank and Sunstein. However, we also note that Frank and Sunstein do not consider the additional complication that because the worker's or the consumer's relevant reference group must be specified ex ante in the statistical model used to include reference group effects, the WTP estimate will be misleading and imprecise if the researcher's assumed reference group is wrong. See footnote 16 and references therein.

million for the EPA ethylene dibromide drinking water standard. How many more policies now pass a retrospective benefit-cost test? None.

What if instead we use the most liberally adjusted (for positional effects) estimate of the value of life Frank and Sunstein consider, $7 million? Two more regulations would now pass a retrospective benefit-cost test, the EPA ethylene dibromide drinking water standard and the EPA benzene NESHAP regulation (revised: coke byproducts). No other regulations in the table of 53 regulatory policies listed by Breyer would become cost-effective. Almost doubling the value of life in economic regulatory evaluation as is currently done would have little effect on the economic desirability of a wide range of regulatory policies. The basic policy need now is not minor refinements in the value of life, such as proposed by Frank and Sunstein. More valuable would be greater agency care in producing cost benefit studies that adhere to currently accepted practices as discussed and described in Gold et al. (1996) and Hahn et al. (2000) as well as greater agency adherence to the implications of the estimated benefits and costs when setting regulatory policy as discussed and described in Sunstein (2000).

Evaluation That Considers Distribution of Outcomes

The issue of evaluating distributional equity in costs and effects of government intervention is like the old saying about the weather, "Everyone complains about it but nobody does anything about it." Just as scientists do not have the technology to change the weather, empirical researchers have not generally had the statistical tools to do justice to understanding the distributional consequences of state intervention in behavior while examining the average overall effect. The good news is that things are changing, and

[19] See Breyer 1993.

elegant statistical techniques have started to appear that produce empirically robust conclusions about cost and benefit distribution consequences (DiNardo, Fortin, and Lemieux 1996; Heckman, Smith, and Clements 1997; Heckman and Smith 1998; Heckman 2001; and DiNardo and Tobias 2001). The bad news is that even the most transparent of the statistical techniques for understanding distribution issues are still a long way from being put into widespread use because of their complexity.

As alluring as the Frank and Sunstein attempt to introduce simply the distribution of outcomes into the typical cost-benefit calculation is, there are good reasons not to do it their way. Our basic objection to enlarging the benefits side of the typical cost-benefit analysis based on the concerns of Frank and Sunstein is that there may be countervailing positional effects stemming from the distribution of the benefit. One's drive for status will include a concern with health and the risk of death or disability, not just income. An additional flaw in the Frank and Sunstein argument is that they do not consider the usual statistical practice that when judging an estimate of, say, an average, the true mean could be higher or lower than the sample average. Moreover, boosting value of life measures as they recommend will have little consequential effect on policy evaluations.

Despite the obvious sensitivity of assigning a value to risks to life, the use of value of life calculations to value policy benefits has become standard practice throughout the government. What accounts for this widespread adoption of the method? In our view the fact that the estimates are based on real market data for life and death choices rather than hypothetical thought experiments is a major contributing factor. Moreover, given the sensitivity of the concerns, it is noteworthy that absolute value of life estimates are derived from the value workers themselves place on risks of death as

reflected in their labor market decisions. The Frank and Sunstein adjustments are based on hypothetical experiments and happiness surveys in the Netherlands and elsewhere for which the link to how people value risks to their life is much less transparent.

Our advocacy of absolute values of life does not imply that there are no remaining issues to be explored. Among the most glaring informational needs are how we should value the lives of the elderly, who may have few years of remaining life expectancy, and children, who have an entire lifetime ahead. Risks to future generations also are difficult to value. Progress along the age and generational lines of program beneficiaries and payers will hinge on ascertaining what the accurate risk-money tradeoff is for each group of interest. Frank and Sunstein seek to complicate policy evaluation with a concern for how a small decrease in one's income implicit in purchasing a reduction in risk will affect one's position on the economic status treadmill. However, we find no compelling evidence that the quest for economic status should lead to any adjustment in the value of life currently used in policy evaluations

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