

What's My Best Estimate?

I've been in many situations that required the development of a "best estimate." Unfortunately, I usually have to go way beyond what I learned in my college probability or actuarial mathematics courses. The textbook approaches often assume that relevant historical data is sufficiently abundant and accurate. But life and the future are rarely that simple.

First, what type of estimate is needed? In a typical actuarial case, a probability-weighted cost associated with uncertain future events is appropriate, referred to as an expected value or mean cost. In contrast, the estimate might have to be weighted differently (e.g., by contracts, benefits, age, or even trend-adjusted). It might be a possible outcome or might represent the most likely outcome (statistical mode) or a value that's equally likely to be greater or less than the estimate (statistical median).

The purpose of the estimate or its user can affect it. Some estimates can be simple and straightforward others are messy, with uncertainties arising from data issues and random events. And pressure to please the user (your boss or client) can be real.

One valuable characteristic of a best estimate is its objectivity. But what does "objective" mean? Is it simply being unbiased with no conflicts of interest, or is it that something is appropriately derived from a reliable source and relevant information? Due to the uncertainty associated with the future, most actuarial estimates involve judgment. This judgment can involve the selection of underlying assumptions or drivers and their associated probability distributions, as well as how to deal with the credibility (as to size and relevance) of experience data.

A single estimate may not be sufficient. Worst-case scenarios and stochastic analyses can be useful in communicating the uncertainty in the estimate. Although stochastic estimates are fashionable, they may be worth the extra cost. Other alternatives may be sufficiently accurate.

Because of actuarial training and experience, many actuaries are naturally conservative in their best estimate. Is there a role for conservatism in deriving estimates? I



say no: Conservatism should be explicitly measured, as a risk adjustment or a market value margin. The approach taken sometimes depends on the types of risk management techniques available, the consequences of getting the estimate wrong.

In many cases, the expected distributions of likely scenarios aren't symmetric. The cost of currently out-of-the-money options and guarantees can no longer be ignored. The lack of symmetry in risk preference may also have to be considered.

I remember my first full-time job assignment—the development of a rate manual for individual life insurance. I spent a lot of time and paper documenting and making transparent the basis of every actuarial judgment I made. Maybe I was being a perfectionist, but I've long believed (even before actuarial malpractice or Sarbanes-Oxley) that for a best estimate to be relied upon, documentation is a necessary evil. Having to explain my estimation process to someone else has always sharpened my own thinking.

Have I over-complicated a simple process? Do I (or other actuaries) always seek the most complicated and theoretically precise approach to what could be a straightforward problem? No matter what, the actuary should be satisfied that her or his best estimate considers the context, constraints, and users involved.

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