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What Isn't an Actuary?

by Mark Mennemeyer

By now we've all heard the jokes and misconceptions about what an actuary is: A place for dead actors; someone who studies birds; that guy played by Ben Stiller (or was it Will Ferrell?) in that "Polly" movie—you know, the one with the magic computer or whatever. I used to joke that I spent my day "actuating," until a friend politely informed me that such a word already existed, and it had no relation to my daily work. For a career that consistently receives top rankings in criteria such as employment opportunities, income and workplace environment, the actuarial field remains relatively unknown.

For a long time I shared the confusion. Prior to becoming employed in an actuarial field, I would have struggled to explain what an actuary was, had anyone bothered to ask. However, after gaining some experience, I quickly came to realize that the actuarial profession spans many areas of knowledge, and perhaps a better question might be: What isn't an actuary?

Let's begin with a simple definition of an actuary: a professional who uses statistical analysis to quantify and manage risk, often in a financial or insurance context. For ease of discussion, I will generally assume a U.S. life insurance context. Performing these tasks involves some use of standardized processes (e.g., the calculation of regulatory capital requirements is largely determined by prescribed methods) combined with a large amount of professional judgment, subject to actuarial guidelines and other best practices. As a result, an actuary must have a working knowledge of many professional areas, each of which I will explore in more detail.

One key topic is accounting. Insurance companies face many financial reporting requirements, and an actuary often plays a prominent role in adequately meeting these requirements. Shareholders require statements prepared according to Generally Accepted Accounting Principles (GAAP), regulators require statements prepared according to regulatory requirements (which vary by state!), and many companies also prepare additional metrics for



internal or rating agency reporting. These requirements do not simply refer to the structure of the financial statements, but to the broader set of assumptions and calculations underlying the statements. A good example of this is Statement of Financial Accounting Standard (SFAS) no. 157, which defines "fair value" valuation principles. Already complex in its own right, SFAS 157 has further interactions with other key statements, such as SFAS 133 (accounting for derivatives and hedging), and an actuary must ensure that actuarial valuations are consistent with all of these frameworks when performed for reporting. Furthermore, an actuary must understand these frameworks when reading income statements or balance sheets prepared by someone else. With expertise in areas such as these, is an actuary an accountant?

Another key topic is taxation. There are many tax implications associated with issuing or owning an insurance policy, and actuaries involved with product development and pricing must understand these issues. For example, Sections 7702 and 7702A of the Internal Revenue Code define the requirements for qualification as life insurance, which allows for favorable tax treatment on death



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benefits and cash value distributions. Most of these requirements focus on the relationship between premium levels and death benefit amounts, and both marketing and administrative perspectives dictate that the actuary should design products to remain within the legally defined boundaries. The first step, of course, is to understand the details and legal technicalities associated with the tax code, which leads to the question, is an actuary a lawyer? A tax ?

Another key topic is computing. The past decade has shown tremendous advances in computing power, and risk management practices have largely embraced these new abilities. Although—thanks to the central limit theorem—it was once acceptable to build models that focused on averages (average mortality, average portfolio yields, etc.), the increasing complexity of insurance products and the more recent financial crisis have shifted the focus to tail risk associated with low frequency, high severity events while highlighting the need for advanced stochastic models. Actuaries have stepped up to the challenges of implementing these models, and many have developed a working knowledge of concepts such as distributed processing and computing grids, not to mention “fluency” in multiple programming languages. With all of these technological advances underway, is an actuary a computer scientist?

A related component of risk management practices is the ability to hedge market based guarantees, such as those frequently embedded in variable annuities. Armed with stochastic models and market indicators, actuaries are called upon to design effective hedging strategies. One technique for developing these strategies might involve studying “the Greeks,” that is, measurements of the sensitivity of derivative prices to movements in underlying parameters. Another technique might involve the development of a replicating portfolio—a portfolio of tradable assets that mimics the behavior of a given set of insurance liabilities. If these techniques sound familiar, it is probably from taking a quantitative finance course.

Does that mean an actuary is a quantitative analyst? An investment manager?

Despite a natural focus on actuarial roles within the insurance industry, many actuaries find a range of opportunities available to apply their skills in nontraditional roles. Actuaries serve as nonprofit organizers, teachers, and marketing directors, just to name a few, and I know at least one actuary who runs a successful food truck. I personally expect nontraditional actuarial employment to grow significantly as wider uses for actuarial skills come into demand.

In summary, what isn't an actuary? Of course I admit that an actuary isn't really a substitute for any of the other professions listed here. Most of us are not formally qualified to give legal advice, audit financial statements, or design computer systems, and it would be irresponsible to believe otherwise. However, actuaries frequently do develop skill sets that overlap with those of accountants, lawyers, teachers, investment managers, computer scientists and many other professionals. These skills enhance an actuary's ability to analyze risk, and they can be leveraged for effective communication with a broad range of audiences. By continuing to develop advanced techniques and unique insight, actuaries will be well positioned to add social and economic value across many disciplines in the future. ☆