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# Model Updates: Playing the Long Game

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Each iteration of a model requires the actuary to follow a disciplined thought process to determine how much effort is appropriate. Sometimes the modeled business and model update generates changes that are not material, or the assumptions have not changed, so little work is needed. Other times, and it sometimes seems like this is more often the case, our world is crashing in around us and we wonder how we can keep up with it.

As I write in April 2020 during a pandemic, this is definitely one of those times. The coronavirus has impacted, either directly or indirectly, assumptions related to morbidity, mortality, asset values, interest rates, behavioral assumptions, tax rates and sales expectations. Even if the COVID-19 virus was only a trigger that unwound the financial excesses built up over the past 30 years, we are realizing that the Fed can't be managed by a maestro guiding the economy to a smooth landing. In fact, we are relearning Minsky's mantra that stability breeds instability. A long bull market has allowed lazy analysis, but the tide is going out and we are finding out who has been swimming naked. What follows is a process that facilitates documentation, shortens turnaround and creates a quality product.

## KNOW YOUR RISK PROFILE

A corporate modeling team understands an entity's risk profile better than anyone else. Typically, only a small subset of tested scenarios is ever shared with management. This group has a greater appreciation of assumption sensitivities than those who priced the product, since they have already seen the historical impact of policyholder actions like lapses and claims. When modelers rotate to a business unit, they bring with them experience that can't be learned anywhere else about how risks interact and aggregate.



Do payout annuities really offer an internal mortality hedge against life insurance policies? Can an insurer identify instances where higher-order interactions have increased risk or where diversification has reduced risks? Examples of increased risk from interactions include companies that wrote the group life policies of occupants while owning the commercial mortgage on the World Trade Center. A current example would be geographic concentration across multiple perils, such as writing both pre-need life insurance and property insurance in low-lying coastal areas prone to hurricanes.

## CONVENTIONAL SOLUTIONS

Actuaries inherit models often built long ago using outdated methods. Recognizing the pros and cons of the status quo provides a good platform for moving forward. If these models have been used effectively for financial reporting or for management presentations, there needs to be a really good reason to replace all or part of it.

This discussion can go well beyond thinking about a model that does cash flow testing. Think about the economic models used and if they make sense in an environment with low or negative interest rates. How do population growth and geopolitics play into these thoughts? Should the company write a universal life policy that requires nominal rate guarantees for many years into the future when rates show no sign of rising? COVID-19 has higher excess mortality (additive) at advanced ages relative to young or middle aged, so consider which products will be most impacted.

## IDENTIFY GAPS IN THE CONVENTIONAL WISDOM

Where do the existing models come up short? Does the investment strategy modeled reflect the actual purchases being made? Is historical claims experience predictive of the future (known known), or has it changed (unknown known), as can happen after a new pathogen becomes endemic (e.g., HIV in Africa) or as the climate warms? Contemplate what time horizon needs to be considered. If the liabilities are guaranteed for more than 30 years (e.g., whole life insurance sold to a 25-year-old, or payout annuities to new retirees), are the asset assumptions expected to be stable over that period? Can I match asset and liability lifetime cash flows at issue? If not, a company may want to shorten the time period of guarantees.

## LEARN FROM OTHERS

What are other companies doing? Compare your company's current practices with external asset managers, the product design of catastrophic bonds or reinsurer best practices. Are competitors selling a similar product as a noninsurer with less stringent regulations? Cast a broad net, and look back to previous historical cycles that are similar. Borrow their best ideas. Find contrarian thinkers who think differently than you do. By listening to them, you will generate additional understanding even when you don't agree.

## CRITICAL EVALUATION

Now that you have collected information from past actions, external sources and your own emerging risk scanning, take a hard look at what matters and how it should be implemented. Complete scenarios, both deterministic and stochastic, to ensure the model meets both regulatory and management needs.

You will need a game plan and buy-in from your manager and likely others. If you have thought it through, your ideas will be encouraged, and collaborating with others will generate even more ideas.

## BEST OF BOTH WORLDS

Models can be qualitative or quantitative, depending on the ability to forecast, materiality and knowledge of the risk. An emerging risk like a pandemic can be initially modeled for a life insurance company very quickly using a simple computation: Multiply the company's net amount at risk (face amount – statutory reserves) by the assumed excess mortality rate (0.5 percent would be considered a tail event), and compare that with the company's surplus position. Did the company remain solvent? What about clusters of events? Can a reinsurer survive a pandemic simultaneously with a California earthquake or global outbreak of wildfires? Quantitative models are required for regulatory purposes, but they should still generate a story

that can be shared with management and the board. The most effective modelers don't take a 100-slide presentation to their board. Having backup is important, but creating a picture or telling stories with specific deterministic scenarios allows the modeler to keep board members awake while having a stimulating conversation.

## OWN YOUR DECISION

If you follow these steps, and document the process, you will have developed a solid process that shows off the skill set of your team and develops each one to progress in their career. Becoming irreplaceable in your current position might sound like a good idea, but making an easy transition for your replacement leads to new opportunities for you.

## APPLICATION TO ENTERPRISE RISK MANAGEMENT (ERM)

This article was developed from a paper written by the author and Mark Alberts<sup>1</sup> as part of a section describing a process for ERM. This section presents the conclusions shared in that earlier paper. In short, playing the long game, based on time horizon and resilience, generates success.

Enterprise risk management is a way to balance risk and return. The tools available—through scenario planning, contrarian thought and common sense—help the analyst better understand the nuances of the block of business and where the shortfalls may lie. For low economic growth, it would be important to look at the risks as components in the analysis. What is causing growth to be low? Is it fertility, or are pandemics becoming more common? How is climate change impacting growth, and how might it change in the future? Which of the many evolving assumptions is likely to hit a tipping point and accelerate or change direction? This type of thinking will help when setting reserves for a life insurer or annuity writer but will become a competitive advantage when thought of as a capital, or insolvency, buffer. Thinking builds resilience, and good ERM requires lots of it. ■



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### ENDNOTE

- 1 Alberts, Mark E., and Max J. Rudolph. 2019. *A Low-Growth World: Implications for the Insurance Industry and Pension Plans*. Schaumburg, IL: Society of Actuaries. <https://www.soa.org/globalassets/assets/files/resources/research-report/2019/low-growth.pdf> (accessed May 21, 2020).