



SOCIETY OF ACTUARIES

Article from:

Risks & Rewards

March 2015 – Issue 65



MIND YOUR MODELING

By Trevor Howes

I think most actuaries have an innate fascination with models. Modeling is an opportunity to create and control something useful, a magical toy built on the past that explains the present and predicts the future. And a toy that is constantly in need of tinkering, adapting and improvement. We love them. Go on. Admit it!

These toys, however, are increasingly important to our employers and to our professional work, and the stresses of rapid environmental change, of the increasing scale of processing, of the human and Information Technology (IT) costs of feeding our models, are mounting rapidly. What is the present state and future outlook for our modeling toy-tools in the investment and ALM side of our business? Do we actuaries need to consider fundamental changes in our thinking and approach?

Actuaries have modeled assets for many years for various purposes, such as Asset Adequacy Testing for Statutory reporting and ALM risk analysis. While important, these functions have tended to be outside mainstream reporting and the models used by them subject to less critical scrutiny. However, asset liability modeling is rapidly growing in importance within new reporting methods such as those required by PBA and IFRS/Solvency II, and for advanced risk analysis driving economic capital reporting and critical strategic decisions.

Companies need to project realistic financial statements of complex events under multiple financial frameworks. Investment and reinvestment strategies contemplate complex asset classes such as structured securities and exotic derivatives which demand more precise models with links to external data sources. These changes will soon cast a brighter spotlight on the approaches taken to asset modeling in particular and the sophistication of the combined asset and liability modeling used.

Events have also conspired to shake our stakeholders' faith in our modeling abilities. Models have failed to protect companies against or even warn them of the possibility of

calamitous events. Changes in the economic and business environment happen more suddenly with greater impact than ever before. Model risk is competing with modeled risk for regulatory attention.

New stochastic techniques will be needed in many cases that require the ability to handle a large number, maybe thousands, of scenarios each of which specifies the key elements of a potential economic environment in greater detail. The demand for realistic financial projections of income and capital may in turn imply nested stochastic projections in a fully integrated asset liability model. Models will need to be fast, robust, flexible and efficient and so will the actuaries that maintain and operate these models.

Unfortunately in many companies, there are difficult barriers to overcome in achieving these performance goals for both systems and their users. The primary obstacle may be a legacy of multiple special purpose models that has evolved over the years, with each model addressing components of the total problem and attempting to work together by simple passing of files back and forth.

Modeling silos are commonplace. It is simpler to rebuild a new more sophisticated model for a specific purpose or specific type of asset or liability than it is to create a fully integrated asset liability model. But a collection of small, inconsistent models increases risk, drags performance and complicates ongoing system evolution. Transformation that consolidates models and modeling platforms, integrates risks, improves asset and liability interaction, and enables both sustainable evolution and improved process governance is the way of the future.

The selection and calibration of economic models has typically been the preserve of an internal finance team in larger companies or outsourced to niche vendors/consultants who sell both the asset modeling platforms and the calibrated models. The move to market consistent valuation is demanding comprehensive market models that take a theoretically consistent view of all types of assets and liabilities

A COLLECTION OF SMALL, INCONSISTENT MODELS INCREASES RISK, DRAGS PERFORMANCE AND COMPLICATES ONGOING SYSTEM EVOLUTION.

and the options embedded within them. New hedging strategies designed to protect company health against these option risks must be priced, valued and projected with a consistent market view. Multiple distinct models must somehow reliably collaborate to deliver a comprehensive internally consistent picture in real time.

The legacy approach to ALM modeling in many companies seems driven by historic preservation of roles and data ownership by functional areas, so that asset data and asset models and liability models are never fully integrated or even run on consistent platforms. But if the realistic projection of economic risk, public financial statements and regulatory capital demand detailed nested stochastics reflecting consistent underlying market models, how is this practical or even possible without a tightly integrated modeling approach reusing core modeling engines and tightly coupled scenario generators for multiple purposes?

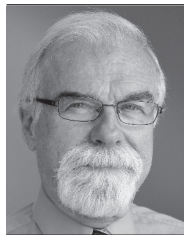
Practical challenges compete with these theoretical concerns for management's attention. Rapidly increasing computing power, with new cloud-based resourcing options offer promise, yet the sheer volume of processing involved in market consistent reporting and dynamic hedging simulation boggle the mind and devour the budget. New innovative modeling techniques are essential to efficiently employ both on-site and cloud-based IT resources, while delivering results that inspire confidence and trust, as opposed to fear and doubt.

Actuaries are used to being intimately involved in the planning, cutting, gluing and assembly of their modeling toys, as well as playing with them. They are not as used to involving specialists and working as a team, in spending time proving and documenting their work, or in submitting to external rules about how to approach their modeling work. To cope in this new modeling world it appears we may need to rethink our professional practices and our attention to personal and professional performance. We may have to start thinking about our beloved toys in a new light. It will

be an interesting challenge.

The new Modeling Section of the Society of Actuaries wants to help actuaries with the challenges of their current modeling and the changes in their modeling that will almost certainly be coming. Model design, validation, control, governance, operation and efficiency are all topics we are thinking about. We expect to have members from all areas of practice and types of business that share common modeling challenges look to us for help, and volunteer to help us address these issues with newsletter articles, ideas for research projects, webinars, presentations at meetings and networking and discussion forums.

We want to work with the other Sections of the Society of Actuaries, like the Investment Section, to help them focus on the modeling issues and challenges that matter to them, that are specific to their practice area, but likely share both complications and solutions with other practice areas. Please consider joining the Modeling Section today and helping us help you! We can still keep our toys if we play this right. 🧩



Trevor Howes, FSA, MAAA, FCIA, is Vice President & Actuary, at GGY AXIS in Toronto, Canada, and may be reached at Trevor.Howes@ggy.com.