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# European Approaches to the Modeling Process Are Changing—What Can We Learn?

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**F**inancial projections and models have been a mainstay of actuarial departments for years. As we look ahead to an environment where models are used for financial reporting as well as financial projections, there is little question that the actuarial workload will increase. Since actuarial models historically have been used for ad-hoc processes such as pricing, business planning, strategy analysis, and cash-flow testing, there is an acknowledgement that better processes and controls will be required to meet SOX and internal audit requirements as these models will now be used for setting reserves and capital. However, it appears that few companies are anticipating significant restructuring or strategic modeling changes and are simply planning to expand existing processes. Suppose, however, that your company would need to double its actuarial staff to meet emerging regulatory requirements with current processes? Would “do nothing” continue to be an option? This is the reality that is being faced by some European insurers as they come to grips with implementation of Solvency II and look ahead to IFRS Phase 2, and market-consistent reporting.

Here in the United States, we are just starting down the path of using actuarial models for financial reporting. What insights can we gain from the European experience? Let’s look at some of the actions that are being taken:

**Rationalization.** As the complexity of modeling requirements increases, companies are taking steps to simplify the internal modeling processes to meet these requirements. Actuarial systems are being consolidated to a single platform. Business logic and modeling approaches are being simplified and a newfound emphasis on reuse is being enforced. Data marts are being created to standardize model input—in-force records, assumptions, and product values. Output is also being standardized for easier aggregated reporting and analysis of results across a wider range of business units. By reducing the number of systems, the amount of business logic, and the variations in input and output structures, the complexity of the modeling process is greatly reduced which reduces maintenance effort.

A long-held European requirement for actuarial projection systems has been the need for flexibility to reflect company-specific product features, management actions and financial structures. While this is still a requirement, some are revisiting the need for flexibility and placing an increased emphasis on the ability to standardize core modeling approaches—i.e., provide flexibility within controlled parameters. The impact is similar to the rationalization of systems, business logic, and data described above—but is even more powerful. Not only is the maintenance effort reduced by the standardization, but the consistency increases understanding of all models across the organization and allows for better resource allocation and utilization. Further, key projection methodologies, such as asset and liability interactions, can be consistently applied and best practices leveraged across all models. This inherent consistency also positions the software vendor to provide ongoing updates and higher levels of support, which further reduces the internal burden.

**Centralization.** Possibly the most fundamental shift in actuarial approach is the movement to centralize actuarial modeling. This is a multi-faceted endeavor as it involves infrastructure, expertise, processes and management. For a multinational firm, added complexity is involved as the centralization spans multiple countries and regulatory jurisdictions. Nonetheless, companies have awakened to the commonalities across these boundaries and are anxious to achieve the economies of scale made possible by addressing the requirements through common resources. Beyond the efficiencies of centralized approaches, companies are also eager to achieve higher levels of quality and development of best practices made possible through collaboration and specialization.

Each aspect of centralization—computing infrastructure (typically a grid), modeling expertise and model management, modeling processes (data management, model execution, report generation, etc.), management—is in itself a sizeable challenge and is beyond the scope of this article. In many cases, formal change management protocols and expertise are being employed to navigate the transition from decentralized operations to the centralized structure.



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CONTINUED ON PAGE 10

**Automation and Integration.** Through the evolution of actuarial models providing one-off insights to being used for regular and external reporting, European companies have come to appreciate the totality of the actuarial modeling process—data assembly and manipulation; assumptions management; model update procedures; business logic development; efficient, scheduled execution of model runs; and aggregation and post-runtime analytics for deeper actuarial insights. With reporting windows tightening and scrutiny of results heightening, the only way to keep pace is to embrace automation, integration and pursuit of a hands-off actuarial process. While relatively new to mainstream actuarial modeling, the automated end-to-end actuarial process has already been achieved for insurance hedging applications. Not only does the automation and integration speed the execution time for the end-to-end process, a key byproduct is the additional actuarial capacity that is now free to analyze, interrogate and understand model results.

**New approaches.** Formulating a comprehensive view of a company's capital requirements requires assessing a complex array of risks and developing an opinion on the interactions and impact of these risks under a wide range of scenarios. New tools and approaches are currently being tested and evaluated for aggregating these risks across a diverse organization. New model compression techniques, Cluster Modeling as an example, are also being developed which enable a company to leverage existing models for higher volumes of scenarios. With advanced model compression, companies achieve the advanced stochastic analyses while losing very little accuracy and maintaining the transparency into the underlying actuarial models.

**Sustainable processes.** European companies have come to realize that actuarial models are no longer just producing one-off results. The results need to be produced on a regular, timely basis. Results must be reconciled across multiple products, functions and geographies. Changes made between reporting periods need to be documented, controlled, validated, and the impact assessed. All results must be fully reproducible and further, all values must be auditable and traceable both within a reporting cycle and across reporting cycles.

To achieve a successful, sustainable modeling process, careful planning and consideration must be taken to structure models for change. Further, change must be embraced, managed and continually assessed—this aspect of the modeling process will never be finished.

**Exposure and use.** Pillar II of Solvency II mandates that the models that are being created to assess the solvency capital requirements are actually used by the companies to drive decisions. It is not sufficient to simply calculate the solvency capital requirement; rather companies must demonstrate that the results from risk models are being actively consulted and used to drive business decisions. This requires that actuarial models are exposed to the broader organization and the theories of risk management permeate throughout the company. While it is recognized that the core financial modeling expertise will reside in the actuarial department, the risk data must become part of the corporate cognition. For this to happen, risk data must be produced regularly and reliably, risk lexicon must be communicated, and tools for risk analysis must be delivered to stakeholders across the organization.

What do these actions tell us about the challenges ahead in the United States? Embedding a model within a mission-critical financial reporting or risk management process will require an approach to modeling that is more comprehensive and more strategic. It is a very different requirement than the ad-hoc applications which have historically been the norm. Larger volumes, complexity and scrutiny of results must be addressed—all while keeping costs and resources down. It is a unique challenge—finding a solution that will meet the paradoxical requirement for modeling increasingly complex products and regulations while simplifying the modeling environment. And this is only the start. Once a strong system foundation is in place, the perspective then broadens to the end-to-end actuarial process and developing internal management structures to ensure consistency and quality across functions and business units. Similar to our European counterparts, we'll likely also conclude that “do nothing” is not an option. ■