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The Actuarial Perfect Storm

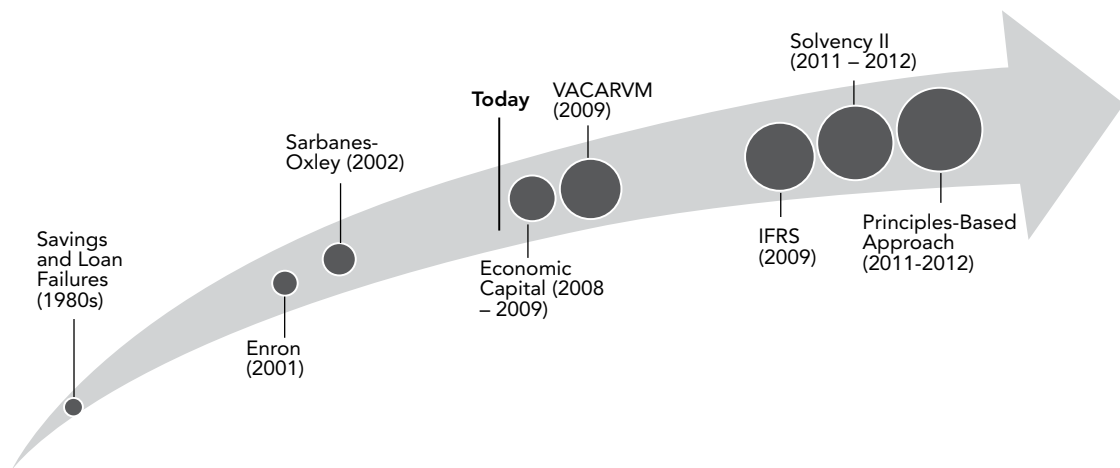
By Sean Burns, Jonathan Houk, and Paul Kosakowski

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Actuaries are being hit with a perfect storm of simultaneous and unprecedented forces as economies throughout the world have been in a state of near collapse. Risk modeling practices of the past are no longer adequate. New solvency reporting requirements have emerged, involving running and then analyzing thousands of model scenarios, whereas in the past maybe only a few were needed. Compounding this, new process and control regulations, making spreadsheets and other shadow systems no longer valid options, are making actuaries rethink the way they do business. What can be done? Companies put themselves at risk of failure if they continue with “Business as usual”, and in the current economic environment, hiring more actuaries to get the work done is not feasible.

As banks and insurers began to discover in 2007, Value At Risk (VAR) calculations were lacking in effectiveness as companies routinely found themselves outside the realm of acceptable risk tolerance. On top of this need for improved financial modeling of risk, is the need for greater maintainability of auditable trails. Auditable trails first became a topic with the 2002 Sarbanes-Oxley initiative which resulted from the accounting scandals of 2001. Insurers are sure to come under even more SOX pressure as the credit crisis of 2007 continues on. SOX pressure is multileveled as insurers must not only maintain auditable trails, they must implement a stringent process and control environment. Each year-end they must then sign off on the effectiveness of that environment. That’s right; corporations need to be confident enough to sign off on the effectiveness of their environments. That’s a daunting requirement that can send shivers down the spines of compliance officers throughout the industry. Fortunately there is a solution. That solutions lies in the latest advances in Information Technology.

Today’s information technology enables actuaries to take financial modeling farther than ever before. At the same time, Business Intelligence, a subsector of Information Technology, can greatly alleviate the pain of



maintaining audit trails. Read on to find out more about the storm and how Business Intelligence combined with Information Technology can play a central role in establishing a business process that can enable actuarial organizations to thrive.

Up until 2003 a great deal of financial modeling was done in a deterministic fashion. As a result of the risk associated with variable annuities and other equity based insurance products that were exposed in the wake of the accounting crisis, it became evident that a more robust analysis of risk was required. Thus, in 2003 a push to a more stochastic assessment of risk began. Stochastic processes are extremely powerful as they allow for the testing of multiple future scenarios allowing for random elements of risk. The only limit to stochastic modeling is the power of the IT infrastructure it is running on. In 2003 it became apparent that the current environments in place were not capable of supporting the multifaceted ability of stochastic modeling. The world of scalable high performance (HPC) computing environments began.

One benefit of stochastic modeling for financial reporting is that one can forecast distributions of results for various points in the future. Adding to this is the ability to create stochastic variation within stochastic variation. Theoretically, a stochastic process can forecast an indeterminate number of scenarios. With the right high performance technology solution in place actuaries can develop and run models capable of forecasting thousands of scenarios utilizing millions of data points. In a high performance environment these models can run extremely quickly allowing the actuary more time to review the output. In fact, in a high performance environment, modeling tools can deliver distributed

processing across multiple processors and PCs. This growth of infrastructure resources and software functionality has allowed actuaries to manage demand for more scenario runs and process more model points with increasing model complexity. But how can actuaries support a high performance environment consisting of multiple machines and multiple servers whereas in the past they were able to maintain software releases and configurations on single PCs? The answer here is to form an alliance with their IT organizations. With this alliance in place actuaries will no longer have to worry about the functionality of their environment and can instead focus their efforts on the daunting task of risk management.

SARBANES-OXLEY

The Sarbanes-Oxley Act is adding to the pressure of more accurate financial risk forecasting by requiring in-depth auditable trails. One section that has specifically impacted the actuarial organizations is section 404 pertaining to Management Assessment of Internal Controls.

Section 404 is affecting business as well as IT units within organizations. Specifically, section 404 has three major requirements:

- A written confirmation by which management acknowledges its responsibility for establishing and maintaining a system of internal controls and procedures for financial reporting;
- An assessment at the end of the most recent fiscal year, of the effectiveness of the firm's internal controls; and
- A written attestation by the firm's outside auditor confirming the adequacy and accuracy of those controls and procedures.

Process and control requirements resulting from SOX are dramatically making actuaries take a close look at the tools they are using to conduct business. For most, this will involve a complete assessment of the use of technology, as technology plays such a large role in the storage and manipulation of financial data from the time it leaves the business areas until it eventually reaches the offices of the CFO and CEO on various financial reports. One area in particular that will be under close scrutiny is the use of spreadsheets. In the past actuaries have relied heavily on spreadsheets due to the ease of use and high-power functionality. While this has sufficed in the past, this use of spreadsheets may put companies at risk of not meeting the requirements of SOX section 404. There is no control and accountability of manually created spreadsheets as they are also difficult to store and maintain an audit history for. New methods of Business Intelligence can have a significant positive impact on an insurer's ability to meet the requirement of section 404.

New methods must be considered that will allow flexibility yet be maintainable and controllable at the same time. Gaining a level of confidence in the audit ability of its IT systems can be a huge headache for companies.

SOLVENCY II AND U.S. SOLVENCY

The Solvency II regime is an effort aimed at reducing the probability of consumer loss or market disruption. These new requirements will require insurers across the EU to change the way in which they calculate economic capital requirements as well as their methodology for maintaining audit trails. Firms will be required to publish accurate details of their credit, capital and risk management. Solvency II will require firms to value their assets and liabilities on a market-consistent basis and that more risk-sensitive capital requirements will address asset as well as liability risks, consistent with the domestic reforms that were implemented for insurers in 2004. Under Solvency II, the capital requirement for an insurer will be calculated on two levels:

1. Minimum Capital Requirement: The level of capital below which ultimate supervisory actions (for example, license withdrawal) would be triggered; and

2. Solvency Capital Requirement: The level of capital that enables an institution to absorb large unforeseen losses.

Solvency II will impact U.S. companies conducting business in the European Union. This said, as more U.S. companies look to expand their presence overseas, it is imperative that they begin to transition to adhere to Solvency II requirements. Recently, the National Association of Insurance Commissioners (NAIC) has adopted a solvency work plan including analysis of Solvency II's impact on the U.S. market. There is also a Solvency Modernization Plan in the works within the United States. Stochastic modeling as described above will play a large role in a company's ability to meet the requirements of the Solvency II regime. An HPC computing environment capable of running high-powered stochastic modeling can greatly increase a company's ability to meet the requirements of Solvency II.

LOOKING FORWARD

Actuaries have faced adversity before. During the first half of the 20th century, actuaries dealt with the advent of group insurance, World War I, the influenza pandemic of 1918, the severe financial problems with income disability and annuity coverage, the great depression of the 1930s, social security and World War II. In each instance actuaries not only succeeded, they thrived. With a synchronistic approach of tying together financial modeling, business intelligence and information technology, there is no doubt that actuaries will once again defeat adversity. ■

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