ERM AS A COMPETITIVE ADVANTAGE:

MOVING BEYOND PBA TO ADD VALUE

GET READY TO SHIFT INTO HIGH GEAR! TAKE FINANCIAL MODELS BEYOND PBA AND ENJOY A COMPETITIVE ADVANTAGE OVER YOUR RIVALS.

BY MAX J. RUDOLPH

Technology evolves. Actuarial software models become increasingly sophisticated. Principles-based approaches (PBA) to setting reserves and capital have arrived. They are not the future. They are here—now. Companies are presenting economic capital models to rating agencies. Enterprise Risk Management (ERM) is a hot topic, and getting hotter. It is no coincidence these are all happening concurrently. All are branches of the same tree.

In the last two issues of *The Actuary*, articles have described regulatory trends, both domestically and internationally, toward principles-based approaches. PBA moves away from setting these requirements based on formulas and toward using a company's unique strategies and portfolios of assets and liabilities. These models utilize a combination of stochastic and deterministic tools to provide transparency using actuarial judgment. This is clearly an improvement over previous rules that seem to always be at least one product generation behind, leaving regulators and other stakeholders unclear of the risks taken. Soon, all actuaries will be using these models. Best practice companies are already going beyond PBA to convert this ability into a competitive advantage. A definition of Enterprise Risk Management, created nearly a decade ago by forward thinking members of the Casualty Actuarial Society (CAS), recognized that risks can be both mitigated and exploited. By understanding which risks a company is adequately paid to take, certain risks can be avoided, or hedged, while others are sought out. This can be done by leveraging the work performed in order to satisfy the needs of various stakeholders to understand the impact of what might be thought of as a normal range of results, as well as an extreme event, on a firm's income statement and balance sheet. Although the tools are available, some in the industry seem to be waiting for regulators and rating agencies to require their use.

Companies build financial models for pricing, valuation and strategic planning needs. Understanding why the models are different, or the pros and cons of using the same models for all purposes, allows value added analysis. Think of them as building blocks, forming the foundation for the projects that provide a competitive advantage. Since regulatory models provide the base that everything else builds from, they need to reflect reality for the company being modeled. No one methodology or set of assumptions will be appropriate for all companies.

Leveraging the Opportunity

Actuaries build assumptions using historical data extracts. This is a problem if the future will be different from the past. Similarly, current market conditions may be driven by something that can only be recognized in hindsight (e.g., equity bubble of 2000). Models created to manage the risks of the enterprise provide an opportunity by helping to make risks transparent to someone using common sense and a critical eye. Companies taking financial models beyond PBA in this way will enjoy a competitive advantage over their rivals. Those who treat principles-based models as simply higher cost versions of formula based models will struggle to understand their firm's actual results and wonder why their firm's financial experts did not anticipate them. Shortcuts designed to reduce costs, whether they be time, money or added complexity, must be documented and tested so that successors are aware of potential model limitations. Models will never be perfect, but iteratively they can help the practitioner understand a firm's potential results and make better decisions.

In the United Kingdom, regulators have already moved to a principles-based approach. There are almost no rules, and companies must defend their work with logic and common sense. The Financial Services Authority has begun hiring economists rather than accountants to police such an environment. A similar partnership has been developed in Canada between insurers and regulators. Regulators in other jurisdictions should monitor and learn from these and other financial institution experiments, incorporating what works and improving the rest. This type of world will require actuaries to stand up for themselves. Unfortunately, a few actuaries might have to be disciplined by society for the profession to understand the change. With freedom comes accountability.

The actuarial control cycle, an example of a learning environment, allows the modeler to iteratively improve assumptions and models. PBA regulatory requirements that formalize current best practices as required will create a self defeating platform. Methodologies will continue to evolve. If regulators don't allow improvements, then they risk having companies maintain one set of models for

statutory reporting and another to run the business. This would be a huge mistake, with the redundant systems themselves increasing the firm's risk. Interestingly, it would create an opportunity for bigger firms to create this second set of models and use them for a competitive advantage. Smaller companies that can't afford multiple models would be forced to work with just the ones that would be approved by the bureaucrats.

Good risk management practice requires interaction between the board of directors and individuals who understand the nuances of the risks taken. While professionals from many disciplines can grow to fill this need, an actuary's broad training in liabilities, assets and the actuarial control cycle prepares the profession for top risk management roles. To meet this opportunity, actuaries must demonstrate the ability to communicate risks and what they mean to decision makers.

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The first step is to understand how a company's current business works. The individual who works on various product lines during his or her career, including stops that give expertise in valuation, pricing, modeling, investments and strategic planning, will have a more comprehensive understanding of the company and better understand the real drivers of its value.

Moving Beyond the Shortcomings of Existing Methods

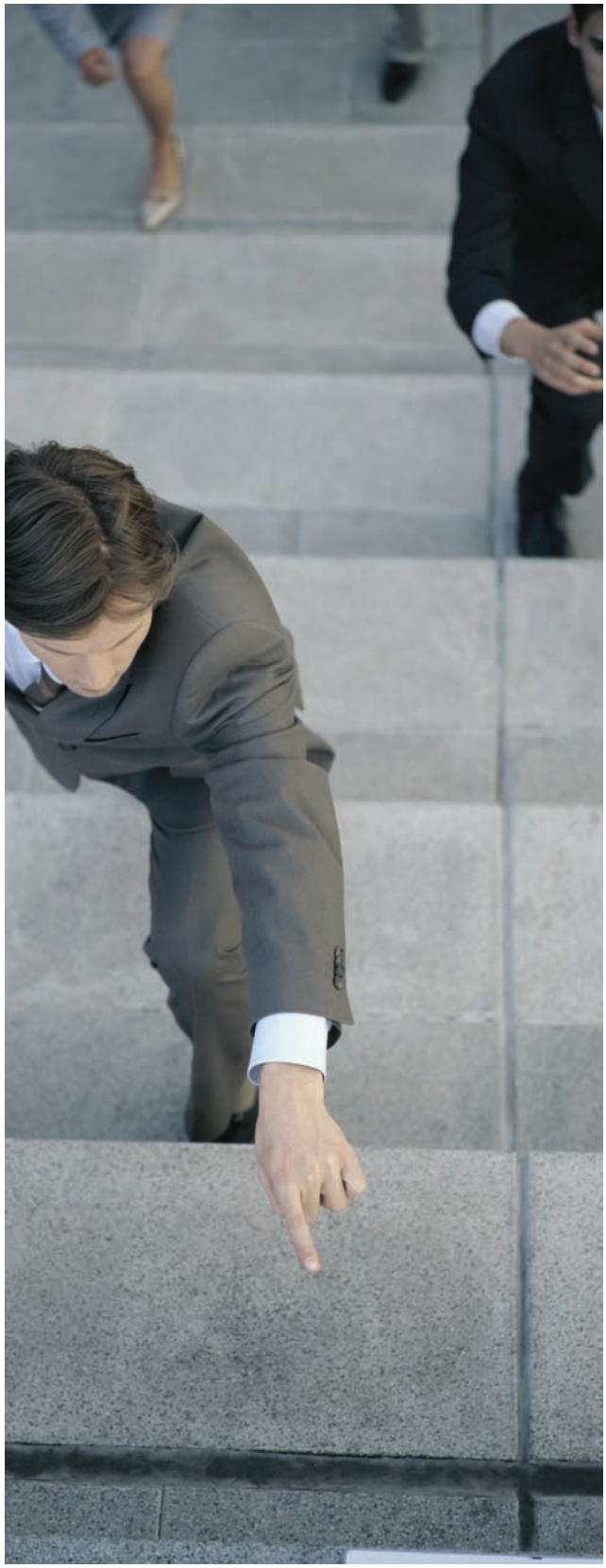
A perfect storm symbolizes a series of low probability events happening concurrently, resulting in a strong storm that causes havoc not seen in a lifetime or more. It is a true tail event. Recently, every scenario that was unexpected is dubbed by the financial press (along with the individuals who could have predicted it with a basic scenario planning exercise) "The Perfect Storm."

It is important that methodologies used by modelers be both transparent and tied to market forces. Pension practitioners have experienced challenges with regard to defined pension plan valuation that they have called a perfect storm. One could argue that the problems could have been anticipated given the combination of a stock market bubble and formula-based valuation system. While it is true that equity values and interest rates were dropping at the same time, using a static valuation method that does not reflect financial markets or encourage financial variables to regress toward a long-term mean was also at fault. The new method appears improved, but does not correct the inherent flaws that ignore the unique aspects of the plan. Modeling techniques are built on historically derived distributions which may not properly reflect the future. Mortality assumptions use only recent experience, yet modelers are asked to include tail risk. New techniques need to be employed to include events such as higher mortality due to pandemic mortality or lower mortality due to cures for heart disease or cancer. In the 1980s, portfolio insurance created a new dynamic for equity investments. This tool provided protection for investors when markets dropped. This worked as long as only a few used it. When too much money used the same tool, it moved the market rather than providing protection. Every few years, central bank chairmen turn over and countries change political direction. Modelers need to be aware that it is easy to lean too far toward the tendencies of current leaders, when they too mean regress to some unknown and changing average.

What recent developments lurk unknowingly today? Here are a few that might create unintended long-term consequences that could destabilize the economy by encouraging risk taking. It is impossible to fully incorporate such uncertainty in financial models.

- Central bank management designed to smooth the economy through economic events.
- Bailout of highly leveraged entities (e.g., Long-Term Capital Management hedge fund in 1998).
- Fed lowering of interest rates to provide liquidity after a physical event (e.g., September 11, 2001, hurricanes or earthquakes).

All distributions vacillate around the true distribution, and it will change over time. Financial markets are no different. Consumers and businesses are continuing to act in more sophisticated ways. Behavioral finance attempts to describe how people will react in certain situations, but it is a moving target. When the current environment is the only reality considered, decision makers and modelers alike must realize that a bet has been placed. Recognizing these deficiencies using the actuarial control cycle, and making them transparent, allows for improvements.



Models will never be perfect, and it is important to understand their limitations, but they provide the quantitative information necessary to optimize an objective function given constraints. For example, asset-liability management projects allow the practitioner to test various investment strategies and product designs to optimize the risk-return relationship. The underlying assumptions in each of these applications are the best available, but understanding where they come up short often creates an opportunity for the practitioner to make low risk bets. For example, if the yield curve is currently low you might argue that regression toward the mean will make rates more likely to rise than fall. It could be a low risk bet to market products like payout annuities and participating life insurance in this scenario. If interest rates are high, mean regression leads to a low risk bet that deferred annuities and term life policies are likely to perform relatively better than other products. The modeler might suggest overriding a constraint like a minimum hurdle rate for pricing, accepting the risk that rates could move against the low risk bet. This will be readily apparent when viewing the resulting distribution using the chosen financial metric and time horizon.

In early 2007, some assumptions that appear to be in the tail and likely to mean regress (eventually) include low stock market volatility, high leverage and narrow credit spreads. But it is not that easy. Assumptions interact, often in ways that surprise even the experts. For example, the rise of hedge funds and private equity pools, with their highly leveraged balance sheets, may have created a new and unknown dynamic. A spike in interest rates could create havoc in these pools as their cost of funds increases. How this will impact various asset classes is untested. The actuary practicing strong ERM will test assumptions in advance and provide his firm with options.

Risk management is about asking questions and developing potential solutions for discussion and potential implementation. Each situation is unique. No one has the right answers. What other combinations of events have been assumed away? Will reinsurers be required by their customers to be more transparent regarding their solvency risks? What firm knows today if their primary reinsurer will survive the realistic combination of a major earthquake during an influenza pandemic (the current situation in Indonesia)? Common sense, forward thinking and transparency are crucial when evaluating the results of models.

Making Better Decisions Through Alignment with ERM

Risk management addresses both risks and returns. An alternative investment strategy that maintains returns while reducing risk by tightening the potential distribution of results will improve a firm's risk profile. There may be instances where adding a unique risk not currently in the insurer's portfolio can increase returns while reducing risk in total. In this case PBA aligns with ERM. A lower risk strategy results in lower capital and reserves. Transparency requires that each product be priced to stand on its own. Many firms have fallen into this trap. Adding a risk when it has limited expertise or understanding has increased, not reduced, the true risk of the enterprise. A company might combine a block of term life policies with a block of deferred annuities. Better yet, products can be combined that provide an internal hedge against a specific risk, like combining life insurance with payout annuities. In this example, it doesn't matter which way mortality moves, better or worse, because one product line does better and one does worse than expected. The corporate area (or Investment Department) can act as a profit center/risk reducer by reinsuring risks not under a business unit's control (like credit risk).

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Every company has a unique set of skills and knowledge. Consider your own company; does your company's investment strategy react as cash flows are collected, or do you work for an investment shop that uses insurance float to provide a source of funds? If a company's expertise is its marketing, should it pass through all financial risks? Banks do this when they put an insurance agency inside a retail branch, collecting commissions but retaining none of the financial risk. If its product design area exhibits an entrepreneurial spirit, then the firm might adjust its strategy for that. Each company is different, and the solution unique. In the PBA world this is recognized. In the ERM world, it is exploited by sophisticated firms. There is alignment.

Ways to Exploit Knowledge

ERM goes beyond regulatory models because it allows a company to manage its risks holistically. Economic capital can measure risk levels across all product line and asset class combinations when done correctly. By using a combination of assumed correlations between each risk, a firm can better understand and manage its unique combination of risks.

Models often come up short, especially when dealing with tail events not included in the historical data extracts. Sensitivity testing across a risk silo, or scenario planning across the enterprise, can provide complementary information. Assumptions can be adjusted to see how much the distribution of results has changed. Looking at a graph that lines up results from matching scenarios to see the change in results is as useful as sorting each distribution and generating mean and standard deviation statistics. As they say, a picture is worth a thousand words. Other sensitivities require only a single scenario. You can get a pretty good idea of the impact of an expense reduction or increase by comparing firm-wide results against the base scenario. Results of other scenarios will be similar. Other assumptions will turn out to be consistent across scenarios, but you might not know that until it is tested. Other times you will be surprised the other way. With each iteration the observant modeler will learn something new and the model will become both more transparent and useful. PBA modelers will develop tools to include these tail events and they will become recognized standards. These might include generators of economic scenarios or other assumptions that move randomly between distributions (e.g., regime switching models), or something better might show up. Regulators should strongly encourage this and not force specific solutions.

Strategic planning must be timely and flexible. Even if a CEO is not presented an interactive spreadsheet to test their own scenarios, turnaround time must be quick for recurring risk metrics. Slow risk management is little different than no risk management. Plans should be developed and tested in advance.

A firm can consciously take a bet. For example, some companies have used their ALM expertise as a competitive advantage by using a strategy that invests assets longer than the liability constraint (increasing the interest rate risk as measured by duration). While the risk theoretically increased, the expected return also increased. As rates came down it was a great strategy. When rates increased for a short period in 1994, mismatched bet takers like Orange County were identified. A similar situation today might occur if interest rates were to spike for those heavily invested in residential mortgage backed securities.

When modeling interest rates, the starting yield curve is often used, along with historical volatility and a long-term mean reversion rate. If you think one or more of these assumptions might not reflect the future, change them. See how sensitive the assumption is (PBA is likely to require this type of analysis). The same can be done with equity generators. While some feel the markets are always correct, perhaps your firm thinks this is not always the case and is willing to use strategies that overload certain sectors or underweight domestic versus international issues. You might be wrong, and should limit exposure to a level you can live with. Risk taking should always be done with intelligence and common sense.

Developing Leaders

Some of the smartest and most marketable employees are modelers. Sophisticated firms will be able to retain them. By giving them exposure to decision makers, allowing them to try ideas even if they fail, a firm will develop creative and intelligent risk takers that form the pool for the next generation of leaders. Models are simply a tool to make risks more transparent so a firm can better understand where its competitive advantages lie. Staying well connected, both internally and externally, will help the risk management professional understand operational risks outside normal day-to-day activities when a crisis hits. They will learn how to communicate with senior management and external stakeholders in advance, and will anticipate questions. They become key players in the strategic planning process, and love their job so much they would do it for free. OK, maybe not free, but it's clearly a good environment for everyone. Firms that hide these talented individuals, using them only for regulatory reporting, will lose their unique skills as they seek better opportunities elsewhere.

Companies will be required to utilize principles-based approaches to satisfy regulator requirements. Those that leverage these models, combining unique risks and strategies, to both measure and manage risk to the enterprise will create a competitive advantage for their firm along with the culture to sustain it. It is certainly true—Risk is Opportunity. ■

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