Enterprise Risk Management for Small Insurers—Blessed Be the Tie that Binds (to Reality)

By Norman E. Hill

The actuarial profession has made some strides in raising the consciousness of its members about enterprise risk management (ERM). Even though the recent financial crisis primarily affected banks, its connection with AIG and other financial institutions has seemingly raised the absolute necessity of keeping company risks under control.

Actuaries who have not thought in depth about ERM still often are charged with related responsibilities. These include reserve and asset adequacy and making future performance projections under a variety of assumptions. Such tasks deal directly with determining the risks undertaken by the company and possible future risks from a variety of activities.

Recent near-fatal problems with banks have pointed out many negative aspects of their activities and shortfalls in proper risk management and modeling. Similar activities of investment banks and the primary noninsurance affiliate of AIG have exhibited negative results. Therefore, the actuarial profession could learn from mistakes in these areas. Although the research could be considered negative, it could provide lessons and result in a positive learning process.

Lessons from *The Quants*

Reporter Scott Patterson has written a fascinating new book, *The Quants*. In a Jan. 23, 2010 summary in the *Wall Street Journal*, headline descriptions of his book read, "The minds behind the meltdown—how a swashbuckling breed of mathematicians and computer scientists nearly destroyed Wall Street."

The quants described by Patterson were a relatively small group of traders who often referred to themselves as "financial engineers." Many quant firms were subsidiaries of banks; some were affiliated with the large investment banks. The main point is that their picks for stock purchases and sales did not seem to rely on performances of individual companies—earnings trends, balance sheet strengths, debt coverage and the like. Instead, they used mathematical formulas and reliance on powerful computers to make what Patterson calls "bets on which stocks were going up or down."

In the summer and early fall of 2007, the housing market in the United States started to fall apart. Banks and hedge funds with large mortgage portfolios could no longer automatically sell these assets to Fannie Mae and Freddie Mac. When they started to sell off stocks to offset these losses, results undid the models of quant firms. The latter firms had not built into their models any possible links between two markets: housing and stock.

The quants tried to deal with rapid stock price declines by selling. Unfortunately, this only led to further declines.

Patterson describes how hedge funds and quant firms tried to figure out which one of them was responsible for the price meltdown. One quant manager contacted the top management of his bank holding company. He tried to pin them down as to how much financial loss in the current stock slide was acceptable. Since they didn't understand how the quant traders worked, and had never been informed about possible risks, they could not give an answer. In fact, their quant subsidiary was apparently a complete mystery to them.

The top management attitude is parallel to one I heard about some years ago. Its context was slightly different, but the effect was the same. Top management of a parent insurance company told one subsidiary, "We don't know what you're doing, but keep up the good work." In other words, "Just remain as profitable as you've been; that's the only thing required by your parent."

In Patterson's narrative, the quant firm was left on its own. The firm's head saw the chaotic condition of the stock market and decided that massive selling was required. The author's words are eloquent, "The entire … finely wrought creations of the quants spun out of control." As realized losses continued to spiral, the description is vivid, "Nearly every single quantitative strategy, thought to be the most sophisticated investing ideas in the world, was shredded to pieces. …"

Temporarily, stocks that had been shorted by quant firms reported huge gains. But this was an illusion, one that did not

last long. Again, in Patterson's words, "Mom and pop investors … had no way of knowing about the massive computer power and decades of quant strategies that were … making a dash of their 401ks. …"

Errors in the quant firm strategies and modeling may be too numerous to mention, but a summary could be as follows:

1. Patterson shows how more than a little arrogance had crept into the quants' use of models and reliance on strategies without anything resembling robust, accurate projections of future events.
2. Stock trading strategies relied on price movements and market trends in a broad sense. Apparently, analyzing long-term stock performance of individual companies in terms of basics, earnings and earnings trends, balance sheet strength, etc., was deemed to be inconsequential.
3. Maybe worst of all, top management was out of the loop. They seemed to be mesmerized by high-powered modeling techniques used by the quants. They never demanded some in-depth explanations of model workings and strategies of their subsidiaries. They were never shown detailed ranges of projections of future events, including possible favorable and unfavorable outcomes. Top management was never asked to define its appetite for risk; in other words, how much loss would be tolerated over defined periods.

Lessons from Lanchester Article—Model Inadequacies in General

Another recent *Wall Street Journal* article (January 2010) references a book by John Lanchester, entitled *I.O.U.—Why Everyone Owes Everyone and No One Can Pay*. The author of the *WSJ* article, Edward Chancellor, notes in his review of Lanchester's book that Lanchester provides some caustic comments worth considering. Chancellor contends that Lanchester blames prevalent mathematical models for notable incorrect assessments of risks. First, mortgage loans sold by banks to quasi federal agencies, Fannie Mae and Freddie Mac, reduced concerns about whether they would ever be repaid. However, ultimate inability of the latter agencies to absorb more loans would eventually impact the banks directly. Effects spilling over to the stock market could drastically impact prices. These risks were never part of model calculations.

Lanchester refers to most models as not just flawed, but "philosophically flawed." Their managers believed sharp downturns in the housing market were impossible and, even if occurring, could not affect stocks. He describes this characteristic as constituting a "break with common sense."

He describes a 2007 U.K. study of banking models, carried out by the Royal Bank's chief risk officer. The study describes how bankers ignored known weaknesses in models and persisted in using them, as long as they generated profits.

Lessons from RMA Article and Risk Appetite

In a March 2010 article in the *RMA Journal* (of the Risk Management Association), "Institutions Need to Better Understand Their Risk Appetite," the consulting firm, Oliver Wyman, conducted a joint bank research project with RMA. The article presents a definition of risk appetite, "… the amount and type of risk that an institution is willing to undertake in pursuit of a desired financial performance." While the research was confined to banks in North America and Europe, it contains a variety of implications for insurance companies as well.

One key conclusion from the article reads, "Senior management cannot afford ad hoc approaches to stress testing and must be aware of all the consequences involved in following a certain stress-testing framework." In other words, senior management as well as boards of directors must have some overall knowledge of how models work, their assumptions and the ranges of financial results generated from models.

Another conclusion of the research is one I would question in part. It suggests that board members should ask about "Black Swan events" and "end of the world scenarios" in model projections. In my opinion, ranges of projections have to include unfavorable outcomes, but not so dire as to go well beyond the organization's risk appetite.

Conclusion

While these stories of past horrific outcomes may all be negative, they have positive potential lessons. The actuary, in overseeing risk management for his organization, must look at the totality of its risk exposure. Confining analysis to more glamorous aspects will simply not do. To the greatest extent possible, the actuary must strive to be free from tendencies and influences to sugar-coat possible outcomes.

Actuarial models and assumptions should be closely tied to his company's actual portfolio of assets, liabilities and products, both currently in force and contemplated. Probably most important, the actuary should strive to communicate to senior management and boards of directors the results of his model projections. He should do so in terms as understandable as possible, often aimed at informed laymen. He should make sure that his ranges of projections tie in with announced parameters previously communicated from these senior officials. To avoid a key pitfall, the board of directors must be kept in the loop. In this way, the actuary's ERM activities and responsibilities can remain tied to reality. ●

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