SOCIETY OF ACTUARIES

Article from:

Reinsurance Section News

March 2003 – Issue 51

How to Prevent the Big Mistake

by Ed Betteto

Recent surveys by Tillinghast and Milliman USA have indicated that senior insurance executives are increasingly interested in adopting a holistic approach to managing risks. Tillinghast reports that 38 percent of companies responding have created the position of chief risk officer (CRO), which is up from 20 percent two years earlier. Notwithstanding the increased emphasis in risk management, the executives are far from satisfied by their organizations' abilities to measure and then defease or otherwise manage their wide range of risks. This last observation is not surprising given that enterprise risk management (ERM) involves a set of processes that do not lend themselves easily to the current pricing,

reserving, accounting and monitoring practices that have been imbued in insurance company cultures over the years.

Despite the formidable challenges associated with implementing ERM, many senior executives have decided that the benefits significantly outweigh the costs. The original motivation began with regulatory and rating agency pressures for management to demonstrate that they are masters of their domain. However, as executives began to understand what was involved, they realized that a successful ERM program would provide a competitive advantage. The same techniques and disciplines that are required to measure and monitor existing businesses and products lend themselves well to making decisions as to which businesses to enter and which to exit and at what prices. Of course, if over time ERM becomes the established norm in the industry, then its adoption may well become the price of admission to the business.

Contributing to the increasing interest in risk management have been several recent financial hiccups in the life industry in both the primary and reinsurance markets. The cyclical nature of the property and casualty industry has been long understood and accepted, while the life industry had been regarded as much more stable. In fact, the lower volatility expected in the life industry has been the justification for ROEs lower than that in other industries. Current talk among analysts is that this expectation may have been reasonable in the past when products were simple in design and easier to understand and insurer balance sheets were comprised of conservative assets.

However, given the complexity and opaqueness of current balance sheets and today's product offerings, insurers and reinsurers may need to demonstrate to various stakeholders that their risks are being measured according to the standards established in other industries such as the banking business.

Risk management practices within the banking industry are generally regarded as being superior to those in the insurance and reinsurance industries, perhaps because banking risks are regarded as more complex or perhaps because banks are more leveraged than most insurance entities. Certainly banks have a head start of many years in implementing sophisticated means of measuring their risks, partially due to regulatory attention caused by banking failures. One might reasonably contend that such attention is required, given the leverage contained on the balance sheet of a major bank, and may be overkill within an insurance company. In this article I am going to put forth arguments that the risks within an insurance company balance sheet have grown to be as potentially volatile as those contained within a bank balance sheet, albeit composed of a different set of characteristics.

There are many recent events and pieces of research (in no particular order) that can be put forward as evidence that insurance entities need to apply more attention and resources towards risk management:

- Insurers and reinsurers have reported significant losses writing credit derivatives wherein they accepted credit risk sold by a bank. Respected and well-informed analysts have recently written that insurers provided naïve and cheap capacity to the banks who are much more sophisticated in the credit marketplace, and several carriers have exited this market during the past few weeks.

- The recent troubles of those entities that possess guaranteed mortality death benefit (GMDB) risk have been well documented; this product deserves a little history as the industry over time turned a benign risk into a dangerous one unbeknownst to senior management. Variable annuities used to be sold in the United States with a death benefit equal to the account value. In some countries (e.g. Canada) a minimum benefit such as 75 percent of deposits is a regulatory requirement. It can be argued that the U.S. industry's troubles with GMDB started with enterprising reinsurers who began to accept minimum death benefits from insurers who wanted to differentiate their products to boost sales from the major broker dealers. Then a product leapfrog game began whereby the GMDB benefits became ever more generous. There are two stories here—the reinsurers sold their GMDB product within their life reinsurance lines of business on the basis that the claim payments were death benefits. The line of business managers had the authority to write this business according to their mandates. Lost in the company's overall risk management process was the fact while the claim payments were upon death, the contingency of mortality was a very small element of the overall risk compared to the exposure to the performance of the equity markets. Furthermore, there was no diversificatio—the more one wrote, the more exposure and volatility. Eventually senior management noticed a large product line and upon investigation were surprised at what they found—and quickly exited the market. Today the market for GMDB reinsurance is virtually non-existent, causing a problem for insurers. What at first seemed like a panacea became a big problem when the choice was between withdrawing a benefit that was popular and widely available or retaining a big risk.

Insurance companies often do not explicitly price for the cost of some customer options...

- Some insurers developed quasi-variable annuities that provided customers with the safety of guaranteed rates of return while enjoying the possibility of higher investment returns in certain asset classes such as convertible bonds. On the surface these were fixed annuities; however, since the asset performance of modern convertible bonds are highly correlated to the performance of the underlying equities, the insurer bore much more risk than was expected.

- Insurance companies often do not explicitly price for the cost of some customer options. This may make sense in protection products like whole life wherein the savings elements embedded in the product are tax advantaged and have shown to be relatively insensitive to interest rate and economic cycles. For fixed annuities like SPDAs and especially FPDAs, a few analysts have recently cited serious concerns as interest rates drop out of the "sweet spot," whereby rates are high enough to stay above the rate guarantees and low enough whereby customers are not financially motivated to pay the surrender charges (if any) to invest elsewhere at a higher rate leaving the insurer to incur significant disintermediation charges. While the current problem is low interest rates rather than high interest rates, insurers have taken heavy losses in past high interest rate environments. It is interesting to note that the reinsurance market for SPDAs has been very quiet. This may pick up when rates increase, but it is much more likely than in the past that potential purchasers of SPDA blocks of business will explicitly charge for customer optionality. While some disciplined insurers carefully considered all of the "moving parts," such discipline is not yet widespread

- In the UK several insurers are on their back foot due to overexposure to certain risks. Some insurers had too heavy an asset

continued on page 22

concentration in equities, up to 70 percent of total assets. When the market value of their equities dropped precipitately, their surplus ratios dropped to unacceptable levels. Other insurers provided very high long-term interest rate guarantees to customers during a short period of historically high investment returns. Given the significant mismatch of cash flows between assets and liabilities, such insurers did not have the means of achieving the promised investment returns and paid the price as interest rates dropped.

- A major Canadian insurance company became insolvent several years ago through an over-concentration in real estate, missing the fact that their exposure was the sum of their actual real estate property and the real estate property that served as collateral to their commercial mortgages

- There has been no shortage of reinsurance company losses reported recently that may have been prevented/mitigated by ERM. Some of these have been well-documented including Unicover, the Lloyds spiral, the medical excess market and the general operational risk associated from granting MGUs with the authority to accept risk on the reinsurer's behalf

Some of these problems may well have been prevented/mitigated through the employment of ERM. However, as a minimum ERM would have eliminated the element of management surprise.

Large organizations involved in numerous product lines over several generations of products face a challenge in evolving their risk management processes toward what is required in today's climate. Newer organizations have had the advantage of incorporating sophisticated risk management processes from the ground up and hiring senior officers steeped in thinking within the environment of strong risk controls. These companies have a chief risk officer who reports directly to the Audit and Risk Management Committee of the Board of Directors and to the CEO. The CRO is a very senior officer and sits on the Executive Credit and New Product Committees. For new companies it is much easier to implement and execute such a structure than would be the case for a large, well-established company. Having said this, however, some aspects of ERM could perhaps be incorporated without dramatic change. I'd like to spend some time on one critical aspect of ERM, namely stochastic modeling and cash flow sensitivity testing.

Stochastic modeling/cash flow sensitivity testing involves the projection of future cash flows over numerous scenarios that incorporate all plausible sets of events. These sets of results can then be used to set prices, reserves, capital levels, risk aggregation limits, etc. The discipline of stochastic modeling/cash flow sensitivity testing within a well-designed ERM program gives management the tools to make critical decisions including:

- Measuring how much risk to take in a particular risk category given the current premium levels and profitability margins available to carry the risk. This tool, within a well-designed risk management program, also allows management to make decisions on similar risks across all product lines rather than merely on a product-by-product basis

- If the market will bear a higher price for a particular risk in one product category than that for a similar risk in another product category, to direct resources to the former and away from the latter.

- Consider risk mitigation tools and approaches that are more cost effective on a risk category basis in lieu of a product basis.

- Ensure that risk aggregation limits are within the mandates provided to the Board.

- Be in an advantageous position in an M&A situation if the counterparty and/or competitors use traditional pricing techniques based on deterministic methods.

- Demonstrate to rating agencies and other stakeholders that the company tightly controls its risks.

Executing strategies without an ERM structure runs the risk of exposing an organization to unseen and potentially franchise threatening events. Within an organization utilizing ERM, decisions are made in a calculated, well-understood and widely communicated manner.

Stochastic modeling/cash flow sensitivity testing and ERM are certainly no substitute for professional skills, management vision and

experience. However, in the right hands, the necessary disciplines instilled through their use cannot help but create decision-making processes that are directed at increasing shareholder value in a controlled manner. In this system, for example, a decision to underprice customer optionality in a product manufactured by a primary company carrying high fixed distribution costs may make economic sense but would only be made consciously by specifically empowered senior decision makers who are provided with a full financial picture. In contrast, organizations that currently price products using primarily deterministic methods rarely consider what are regarded as outlier scenarios. Sometimes the important decision as to which assumptions are most likely and which lie in the outlier scenarios can be made at a surprisingly low level.

I recently attended an industry conference whose featured speaker was a prominent economic historian. His main message was that the organizations that survive and thrive are those that are aware of the financial consequences of the outlier scenarios, because they do happen. They don't happen often, but they do happen. An organization should not plan for such events as a main scenario, but rather should be aware of the possibility—and price properly for the risk. The event may have a small chance of occurrence as gauged by the recent historical past, but the risk is rarely zero. Furthermore, when the occurrence of the outlier scenario threatens the franchise, carefully consider how much of the risk to incur. This message sinks in when one thinks about the strong former franchises that were destroyed or seriously damaged by disregarding this simple point.

It may be instructive to use a hypothetical example to illustrate how stochastic modeling/cash flow sensitivity testing can be used to avoid the big mistake. Say a writer of universal life finds itself in a sustained high interest rate environment wherein historically high minimum crediting rates are required. Sales are booming and the product line now represents a high percentage of the company's business measured by assets and liabilities. By all of the company's financial measurements, this is a successful time. The existing requirements for cash flow testing and interest rate scenario testing demonstrate that the risks are manageable. Many organizations would be very satisfied with this situation. An organization with a disciplined ERM culture, however, would continue to carefully examine what could go wrong, even under scenarios deemed highly improbable. In the above situation, for example, the product design likely allows customers to pay premiums into their accounts that are multiples of their initial premium levels. If interest rates were to drop to levels several hundred basis points below the minimum guarantee, how much more premium might customers start to pour into their accounts? What if premiums doubled or tripled during this period, leaving the company with a gross investment yield on the large flow of excess premiums well below the minimum crediting rate? While recent history

suggests that customers treat their universal life plans as protection products rather than investment products, the disciplined organization does not dismiss this scenario but rather examines the financial outcomes through stochastic modeling/cash flow sensitivity testing and then attempts to estimate the probability of its occurrence. During this exercise, a lot of thought naturally takes place into what could lead to the feared scenario. During a prolonged low-interest-rate environment, could something cause a change in behavior from past practices? Might the independent field force increase their advice to high-net-worth customers to move their premium payments to the maximum allowed in the contract? Is there any possibility of the development of a secondary market that may change behavior patterns? The likelihood of any

continued on page 24

such scenario occurring may be judged to be near zero. Nonetheless, if management were aware that the financial projection under the scenario demonstrates that the survival of the company would be in jeopardy, wouldn't they expend the resources to go through the exercise?

A stochastic analysis produces various financial outcomes at several points in the confidence curve—say at each of 70 percent, 90 percent, 95 percent, 99 percent and 99.9 percent levels of confidence. Management may be content to make many decisions with only a 70 percent degree of confidence, judging that the winning decisions will more than make up for the losing decisions. In order to make informed decisions, however, management needs enough information to weigh the possible range of financial outcomes. When presented with a decision on a very large risk, management is likely to want a very high degree of confidence in the outcome. A 99 percent degree of confidence may sound very high. But would management really want to take a one in 100 chance of endangering the company? In such a situation, an informed management may well seek to limit the risk, even if it meant some restrictions in the company's core product line. Perhaps a tightening of the contract terms may work. Perhaps some macro interest rate hedges purchased cheaply when rates are high could mitigate the risk. Perhaps the reinsurance markets or the capital markets may offer solutions.

Outside of an ERM culture, it is quite easy to miss a big problem within the increasingly complex insurance and reinsurance markets. Some decisions made within the organization can have unforeseen consequences unless the time and effort expended on a disciplined stochastic analysis is directed by experienced professionals. It is fair to say that the management of most of the companies that have recently experienced a major financial accident were surprised not only that an event of such magnitude had occurred, but also that it was within the realm of possibility. A well-run enterprise risk management program would have flagged the risk. Furthermore, the analytical exercise involved in the identification of the risk itself may well have led to a risk mitigating solution so the opportunity could have been pursued within acceptable risk parameters.

Ed Betteto is Senior Vice President and Chief Actuary, Life and Annuity at Max Re located in Bermuda. He can be reached at EdB@maxre.bm.

Press Release

SOA Names New Insurance Administrator—Marsh Affinity Group Services

We are pleased to announce that the Society of Actuaries (SOA) has appointed Marsh Affinity Group Services to administer insurance programs for Society members.

Marsh is a full-service insurance broker and administrator for affinity groups. A pioneer in the concept of association-sponsored insurance plans since 1949, Marsh Affinity Group Services has earned a reputation for the innovative design and administration of a wide range of insurance and financial products, and has become a leading provider of insurance program management and underwriting services in North America. Marsh Affinity Group Services is a part of Marsh & McLennan Companies, a multinational corporation and one of the world's foremost leaders in insurance administration.

By purchasing insurance programs through SOA, members can take advantage of a wide variety of benefits. These programs have been researched by the SOA and have been proven to be an excellent source of protection for members. Also, with the mass-purchasing power of the SOA, members can benefit from the group rates offered.

Insurance plans currently being made available to SOA members include:

- Professional liability insurance
- Disability income insurance
- Term life insurance
- 10-year term life insurance
- Catastrophe major medical insurance
- Major medical market basket

Members who have any questions, or who would like more information, may contact the insurance administrator:
Marsh Affinity Group Services
a service of Seabury & Smith
1-800-503-9230 • *www.seaburychicago.com*