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Talk with a Risk Management Guru—Interview with Ken Mungan

By Jenny Jin

FIVE YEARS AFTER THE 2008 FINANCIAL CRISIS, the world is in a much different place than we have observed in any historical period. The life insurance industry has found itself changing faster than ever to keep up with customer demands while trying to manage a sustainable business. The Joint Risk Management section newsletter sat down with Ken Mungan, founder of Milliman's Financial Risk Management practice, to speak about the latest changes in the industry and the role that risk management will play in shaping the future of the business.

JENNY JIN: HOW DID THE FINANCIAL RISK MANAGEMENT PRACTICE GET STARTED?

Ken Mungan: In the late1990s, Milliman put out a survey to the largest insurers at the time asking them what changes they see emerging in the market and the areas where they needed help. One of the biggest take aways from the survey was that the life insurance industry was transitioning from selling protection oriented life insurance products which were mostly backed by fixed income assets to offering retirement savings products which were largely invested in equities. Companies were also backed into offering guarantees on these products. Executives at these companies were aware of the risks involved but did not have the expertise at the time to address them. Milliman saw the opportunity and I joined the firm to help with this initiative. The internet bubble bursting and technology boom of 2002 was really the trigger event that moved the practice from the back burner to the front burner and when the practice was able to grow substantially.

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JENNY JIN: HOW HAS THE PRACTICE AND INDUSTRY EVOLVED SINCE THE BEGINNING?

Ken Mungan: In the early 2000s, life insurance companies were reluctant users of hedging but it has now become a core competency of every major life insurance company.

Risk management before the financial crisis used to be a behind-the-scenes activity. Now, because of the experience during the financial crisis, consumers demand access to risk management services themselves. For example, Variable Annuity markets used to emphasize tax benefits and brand names of various funds that were offered in the product. Today, customers are showing up at the door looking for active risk management and insurance companies are highlighting these features front and center.

If you look at Variable Annuity products, risk management has gone directly into the funds. Hedging occurs inside the fund instead of on the company's balance sheet. With previous generation products, customers had long-term guarantees but during the financial crisis, they had to watch their account value drop significantly and as a result suffer illiquidity. By providing customers direct access to the hedging program via risk managed funds, insurance companies can provide guarantees which are less costly to hedge and this will ultimately benefit the end customer. The one thing that I have learned is that the life insurance industry is a very competitive industry. Any cost savings will filter through to the end consumer. It may take some time, but ultimately the consumers will get the benefit.

JENNY JIN: WHAT ARE SOME RISKS THAT INSURANCE COMPANIES FACE IN THE POST CRISIS ERA?

Ken Mungan: Insurance companies now recognize that the equity market risk they face is higher than they realized prior to the crisis. That is an area where there is a tremendous amount of focus and a lot of progress has been made. While the risk is clearly there, the life insurance industry is better equipped to handle it than they have ever been. But there are also other risks.

The interest rate environment is very challenging today. We have historical low levels of interest rate and that

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presents many challenges for the life insurance industry. Companies have to be prepared to survive through this period of sustained low interest rate. And at the same time, with quantitative easing being reduced or eliminated, companies need to be aware of rapid spikes in interest rates which could be equally damaging. So companies need to be prepared for two opposite scenarios and attend to interest rate with an intensity that the industry hasn't seen in a while.

One thing that the financial crisis taught us is that it is important not to let risk management decisions be second to short-term decisions around financial reporting. Sometimes, companies try to engineer their quarterly GAAP income in a certain way and they end up making certain risk management choices to hit a target or profile. The Financial Crisis has shown that if you are leaving yourself vulnerable to serious market risk, then there will be problems in the long run. Because when a financial crisis develops, all the rules of the game change; the focus shifts from short-term earnings to showing that you are protected against this bad event that is unfolding—from GAAP measures to Statutory solvency reserves and capital. Companies need to put the core risk management framework in place first and let that guide their decisions, understanding and conveying to the market that there may be some noise in short-term earnings because we are trying to build a stable company for the long run.

JENNY JIN: HOW CAN COMPANIES ADDRESS THESE RISKS AND PRODUCE SUSTAINABLE VALUE IN THE LONG RUN?

Ken Mungan: In the past, companies protected balance sheets by purchasing long-term options, matching durations and so on. By changing the game so to speak, and adding protection strategies into the products, companies can manage the risk holistically. Rather than doing things in a linear fashion and being reactive to the way things are presented, you end up with a more efficient solution to fulfill the needs of customers.

Customers want to know that they are able to withstand market volatility, have sufficient cash flow to respond to unplanned needs and not run out of money if they live to be 90 years old. Offering customers a straight up guarantee consumes scarce balance sheet capital and is often not the most efficient way to fulfill the needs of the customers. Instead of maximizing sales of particular products, Insurance companies are really trying to maximize meeting the customer needs from a financial planning point of view and in the process lowering the risk of their own balance sheet.

The truth that is the life insurance industry has a golden opportunity with the retirement of the baby boomers. I read a survey recently that asked thousands of individuals "What are their primary financial concerns?" The top five answers were market risk, longevity risk, inflation, long-term care, taxes. If you think about the top five concerns, four out of five are risk management issues and they are issues that are addressed by the life insurance industry and the products that life insurance companies sell. You couldn't possibly have a better market!

JENNY JIN: WHAT ARE INDUSTRY BEST PRACTICES WHEN IT COMES TO HEDGING?

Ken Mungan: What I am seeing is that the best practice is divided into two segments: pre-crisis and post-crisis. Prior to the crisis, funds are invested in benchmark indices and hedging practice follows traditional option pricing theory. The broad consensus is that you have Delta and Rho hedging. When interest rates become really low, we see that some companies will scale down their Rho hedging. On Vega hedging, the reality is that the customer's option is not an option in the financial engineering sense. The customer is not an option trader- they don't buy and sell their contracts. The volatility exposure that companies have is a multi-decade illiquid option. So the insurance company needs to be able to quantify what that volatility exposure is and manage it over the long term. What this means is that when implied volatility in the market is at or below pricing volatility, they should be a buyer of volatility and vice versa. The insurance company does have a fundamental advantage in that the options they underwrite are illiquid so it doesn't make sense to ignore that.

The game changes completely when you adopt managed risk funds in the products. It means that insur-

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ance companies' hedging should be residual hedging. Instead of hedging a linear combination of indices, companies have to model the embedded strategy and calculate the residual exposure. Typically that means the Vega more or less disappears. While the stock market may experience persistent high volatility, the funds will be able to adjust and rebalance in a matter of days. The strategy doesn't stop there, most funds also have a capital protection piece which means that the Delta exposure of the company is also reduced. It has really been a whole sale reengineering of one of the industry's core products and companies are making progress in terms of embracing all the changes involved.

JENNY JIN: INSURANCE COMPANIES UNDERWRITE LONG-TERM ILLIQUID OPTIONS AND THEREFORE NEED TO PERFORM VALUATION USING AN ESTIMATE OF VOLATILITY. WHAT VOLATILITY BENCHMARK SHOULD THEY USE?

Ken Mungan: If you look at the exchange traded market and the OTC market, it is a short-term market and the liquidity dries up very quickly beyond five years. The participants in the options market are highly leveraged, such as hedge funds and propriety traders. So when financial conditions deteriorate, there is a rapid accelerated withdrawal from the market due to this leverage. When you look at implied volatility, the measure contains two pieces of information: the market estimate of the volatility and the degree of leverage of market participants. If you take those two measures and apply it to life insurance companies, you will get a distorted picture. To the extent that the goal is to provide life insurance companies with the best estimate of the obligations of the insurance companies, then we should focus on the first piece, which is the volatility of the market itself.

One of the things that Milliman did is create The Milliman Hedge Cost Index™ (MHCI) to address this. We use stochastic volatility models to calibrate to market data and come up with current best estimate of the volatility term structure. Companies have used this data and incorporated it into their own valuations. Over the past couple years, this has become a typical industry practice that is widely accepted by auditors and positively viewed by the rating agencies.[1]

JENNY JIN: HOW CAN THE SKILL SET AND RISK MANAGEMENT TECHNIQUES WE HAVE LEARNED AS ACTUARIES BE APPLIED OUTSIDE OF THE INSURANCE INDUSTRY?

Ken Mungan: The concept of having a hedging strategy inside a fund originated from the pain and suffering of fund managers and financial advisors. What we have found is that the traditional measure of return over a short period of time is not suitable for people managing their personal finances and planning for retirement. Over the long run, a managed risk strategy has the potential to outperform the traditional buy and hold strategy in this context. The reason is two fold. First, volatility destroys value. Mathematically speaking, if you extend the time horizon, your annualized returns are going to be reduced by volatility squared over two. Secondly, there is the sequence of return problem. While a fund may recover from a market downturn in three, four or five years, this is not necessarily true for the investor in the fund. If you have an investor taking withdrawals every year for retirement, they will be depleting their account at an accelerated rate and they will not recover when the market bounces back. When you take these factors into consideration, we find that the everyday investor who is planning for retirement is fundamentally better off including risk managed funds in their portfolio.

There is a huge market for retirement products, both guaranteed and non-guaranteed. As baby boomers go into retirement, entirely new markets have opened up and actuaries are well positioned to advise in this market. In the past, the focus of investment and retirement planning has always been on relative value analysis and stock selection; and actuaries did not really participate as our skill set was less relevant here. Now that the true value of risk management is appreciated, we have got ourselves a seat at the table.

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JENNY JIN: FINALLY, WHAT ADVICE WOULD YOU GIVE TO A YOUNG ACTUARY STARTING OUT HIS CAREER?

Ken Mungan: I think it is a wonderful time to be in that position. I would encourage young actuaries to specialize in financial risk management. There are so many fascinating problems to work on today and there has been so much progress in the past ten years that you are able to take what has been done and build on it even further. The reason it is more attractive today than it used to be is that risk management is now a core function. You have the opportunity to participate in the financials of the company at a much higher level than before, in a much more central way. There is a much greater appreciation of the skills that actuaries bring to the table. Getting through the actuarial exams is really tough but it is well worth the pain and suffering for the benefits that come through so my advice would be to stick with it and enjoy the fruit of your hard work! ■

ENDNOTE

[1] The Milliman Hedge Cost Index can be found at *www.milliman.com/Solutions/Products/The-Milliman-Guarantee-Index-and-Milliman-Hedge-Cost-Index.*