

Opening

Timing is everything. These are exciting times for Chief Risk Officers. The subprime phenomena has led to such visibility that you can't open a newspaper these days without mention of a firm's ability, or, all too frequently, it's inability to manage its risk. And that's where we can step in. We're the risk people!

And as always, Risk creates opportunity.....personal risk is high as Boards and regulators probe the adequacy of risk measures and controls. Even CEOs have been fired. But the opportunity to contribute to a firm's value is greater than ever with all the focus on identifying and quantifying risk, whether in appropriately valuing assets and liabilities for extreme scenarios or managing limits for a firm's risk profile to minimize the next financial or non-financial global problem. And bridging the various risk elements to create a truly enterprise view. Fortunately, CROs have now typically made it to the "C" suite....which is critically important for access to information and the ability to ensure remedial actions are actually implemented. But the challenge now, in these times, is staying in the "C" suite....personal risk management balanced with the enterprise's risk management.

Personal experiences always influence our perspective and in my case I was fortunate to see just how an engaged CEO and Board, with a real commitment to risk

management, can build real value. ZFS went through a “near death experience” in 2002.....with financial guarantees emerging from the woodwork, reserve inadequacies, little data on risk accumulations, whether on the underwriting or investment side, subsidiaries operating very independently, and on and on. Jim Schiro entered as CEO and immediately launched a large number of critical improvement actions, including raising capital, asset sales, expense measures and a focus on core businesses and systems. And one of these critical initiatives was a solid mandate to build a state of the art risk management program and embed it in the organization.....and in every move we made, we always knew we had the full backing and support of our CEO. That’s unquestionably the single most important key to success in implementing a risk management framework.

This June, five years later, S&P returned ZFS to “double A” status, and in their press release particularly noted improvements in risk controls and management. And then a month or so ago, Jim Schiro received an award from St Johns University as “ Insurance Leader of the Year” which singularly noted that he was an “exceptional leader with a comprehensive view of risk taking and risk management” . Which showed me that during all that time, when we had our meetings... and he was looking at his Blackberry....he really was listening!

Today we'll talk about three themes: 1, Successfully embedding ERM in the firm; 2, developing models and setting parameters, and 3, incorporating and supporting the latest ERM research.

1. Embedding ERM in the firm

Most critical is the interest and involvement of the Board of Directors . Today that might not be an issue, but today's risk failure headlines won't always be top of mind.

Risk Tolerances, and how the firm monitors compliance with the agreed tolerances, are a good starting point as they are at the heart of the Board's governance responsibilities and, as a practical matter, the discussions quickly become engaging. Questions on what the Board wants for maximum volatility, quarterly or annually, in an agreed period of time, say one in ten years, in: Net Income (posting a loss, for example), ability to maintain Dividends, Solvency and rating agency Capital at levels not impacting operations or strategic initiatives, and Franchise Value (performance versus peers).

And then intriguing questions such as balancing a maximum loss on a hurricane vs an operational risk loss. Or one in foreign exchange trading vs. non-investment grade bonds. All affect the balance sheet the same way but the perceptions from the investors may well be vastly different. Thinking through the "New York Times" test....with the goal of avoiding the "whatever were they thinking"

questions...also makes for good engagement with the Board.

The Board sets the tolerances at the highest level. The risk framework then extends this tolerance to units at the operating level, with the intent of providing transparency and an internally consistent framework. Generally this leads to a Risk Policy with internal limits on most everything, at unit and divisional levels, and which allows such limits to be actionable and monitored at the lowest levels. It's the risk modeling and the risk management function that ensures, and reports, that the actionable limits, when aggregated across the firm, reasonably meet the risk expectations implicit in the Board's high level agreed tolerances. It's also important the Board review and agree the internal operating risk limits...again, to engage them, but also to provide an element of clout within the firm to ensure adherence.

Another measure to engage the Board is what we called Total Risk Profiling...a structured exercise with a senior management group that develops and evaluates scenarios for risk implications, reviews remedial plans and the status of agreed follow-up actions. Including the Board and senior management provides for the broadest views on stress scenarios and a solid way to get real involvement and ownership. And this is key to considering bold scenarios. As the CFO of Goldman Sachs the other day remarked: "the lesson you always learn is that your definition of extreme is

not extreme enough". You need the leadership and involvement from the top to try to identify Donald Rumsfeld's "unknown unknowns"the risks "we don't know we don't know".

Discussions of emerging risks are an important element; not just which ones might in fact emerge (nanotechnology, climate change, pandemics, cell mutations, etc)...but why are they relevant to our firm? Or major changes in foreign exchange, or the credit markets. How might they be relevant? The CRO needs to do the "homework" of course, on the stress scenarios and relevant exposure numbers, but such exercise are a good way to embed risk management in the organization. If the top dogs at Board level do it, you can quite effectively get the businesses to emulate the exercise at their levels....and to stiffen up the scenarios they consider. Then you can really harness the creative power of the organization.

With the Board involved and demanding information, the mandate is there to establish Risk Committees at all levels in the organization. Designated CROs, too, even if not full time, to organize the risk activities....including the risk profiling activity, review of risk exposures vs. risk policy limits, progress on remedial actions, and providing relevant information upwards. The breadth provides an important comfort to management and the Board. But it's also valuable in embedding the risk culture in the organization

The enterprise view necessarily requires bridging the silos in an organization. My experience is that it is best if the CRO allows each functional area to carry out its own risk management. Risk management coordinates, ensures rigor and that the limits fit the overall profile, and so forth...but leave responsibility for the day to day risk oversight in the specific risk area. Why? Ownership within the area and then RM can be more the "auditor" and keep its primary focus on correlations, aggregations, modeling, scenarios and so forth at the enterprise level, which are at the heart of an ERM program and where the real value is added.

Operational risk (including BCM) is another way to increase awareness and involve local management. Subtleties such as allocation to line and geographical unit help to get data collection more reliable, follow through actions implemented, and so forth. More important than the rigor, though, is the idea that you are doing allocations and that makes it important, and so actions follow....if no consequences, it becomes a "nice to do". Operational risk losses can have greater consequences than, say, a hurricane loss....one is our business and the other is a sign of weak controls and management. This sends a tough signal to the markets.

Collectively, actions like these engage the Board and drive ERM into the organization. Nirvana is when the audit committee (or finance committee) gets so engaged with

risk issues that the Board decides to create a risk committee.....which Zurich did in 2006.

2. Develop models

Critical is simply collecting relevant data. A mantra of Zurich's Jim Schiro is: "what gets measured gets done" (and paid attention to). This requires addressing system incompatibilities, standardizing definitions, etc, so that measures of risk exposure can be aggregated on a consistent and meaningful basis.

The models, of course, are what provide the overall framework to aggregate the firm's risk tolerance to specific risk limits by segment: credit risk, investment risk, ALM risk, underwriting risk, F/X, and so forth and incorporate assumptions on correlations and distributions. And the models are unquestionably important.....but almost more important than the models and their "results" is the discipline in setting the myriad internal risk limits, monitoring compliance, aggregating relevant accumulations across the organization, and so forth. That's where real risk management value gets added.

Assessing aggregate credit exposure is a good example of the complexity and need for data capture across the firm: Reinsurance assets, exposure in the UPR, bonds, equities, security lending, performance guarantees and surety bonds, E&O and D&O all have the potential to aggregate into a loss in a stress situation for a firm. Or in the insurance arena: group life, workers compensation,

property on the building, D&O, E&O, equities, bonds, guarantees of various types, etc. All present complicated data capture issues, especially in an international organization, not to mention referring and acting on incidents of excess accumulation. I'll talk later about some research ERMII members are doing in this area.

Important is collective input on correlations....and particularly correlations for stress scenarios. Valuing underwriting exposures, assets and liabilities in stress situations, too. Richard Bookstaber the author of *A Demon of our Own Design*, observed; " we must move from the "technicalities" to "judgement". KISS principle is alive and well. In identifying the key parameters....especially correlations... we need to get outside and inside views and create a transparent process for the final selections and related probabilities. Both for buy in from senior management and the Board and for the explanations when and if an incident arises. Must balance sophisticated with the practical if one is to avoid what Ben Bernanke describes as the all too frequent: " misunderstanding of financing models among senior management, or a failure to recognize and cover limitations of the models."

A typical scenario that would provide valuable discussion with the management group would be how interconnected global markets should make the world economy more stable, with risk spread more widely. But, Richard Bookstaber writes: "its not happening". What's different

now is how is how closely international markets are correlated with one another. "Everyone tends to invest in the same assets and employ the same strategies" "As markets become more linked, diversification doesn't work as well" And, "global markets may actually be more risky than in the past, as the same types of investors are taking on the same type of risky bets and then simultaneously heading for the exits when trouble comes"making the hedging fail or become unavailable. Stress scenarios we need to consider for their impact on a particular enterprise need to contemplate such unfolding economic relationships.

The models are also necessary for capital allocation (but again much of the value isn't in the allocation, but in the understanding that capital is being allocated and if one effectively and transparently manages risk it leads to less capital.....an important outcome). This is much more important than the nuances on the allocation. It's the same for the operational risk allocation. Too often, we don't allocate such expenses because we can't provide sufficient "accuracy"but it's the idea that it is being allocated that lines up the "hearts and minds".

Another aspect of the models and relevant data is to question values under extreme stress scenarios. The subprime meltdown is of course a recent glaring example. But as a general rule, and going back to Jim's: "What gets measured gets done", perhaps it should be expanded to "don't do what you won't be able to measure". You don't

want to go to your management with a quote like Ben Bernanke's on CDOs, when he said: "I'd like to know what these damn things are worth." And in this vein, we have preliminary plans in place for ERMII to develop a joint workshop in the Spring with Columbia on valuing illiquid assets. And the research track at the ERM Symposium will include work on certain aspects of quantifying credit risk.

3. Incorporate and support latest research

Why the importance? Partly defensive.....if adverse circumstances develop, you want to be able to demonstrate an appreciation and work toward "state of the art". And there is some good research work going on now. The task is to determine which best practices could meaningfully and reasonably be incorporated in the risk models, impacting stress scenarios, correlation parameters, and so forth.

ERMII members are one good source for such research. The CAS is a sponsor of ERMII, as well as the Institute of Actuaries in Australia. It has a clear research focus. Academic institutions are the members, and include Columbia University, University of Lyon, Carnegie Mellon, University of New South Wales, Georgia State, Wuhan University, in China, and others .

ERMII recently had a research workshop in Lyon on evaluating diversification at the group level.....which was typical of a number of such research activities. A brief overview of the presentations includes: One by Shaun

Wang, at GSU, on *Correlation Modeling and Correlation Parameters for Economic Capital Calculations*, which examines various drivers of correlation, along with their diversification benefits or contagion effects. Included also are some tail correlation models, including correlation between risk factors, business lines and geographic regions. Alexander McNeil, from Heriot-Watt University in Scotland, explained how Mixture models for random vectors may be useful in risk modeling. Steve Kou, Columbia University, tackled the question: What is a good risk measure? Other presentations included applications to multi-period risks, while several presentations focused on diversification and when it is a benefit and considerations in allocating the cost to the underlying business of the benefit. Gary Venter had an excellent presentation on pricing the "option" a subsidiary has on the firm's capital. All interesting, practical insights. The presentations are on the ERMII website: ermii.org; see which ones might be relevant to your organization.

Broadly the subjects are extremely relevant now. Very mathematical but the real internal value is in discussing the relevance to a firm's risks and the discussion of parameters, stress scenarios, etc...getting them identified and senior management's involvement in determining them. Also participation in such research work on correlation factors might well provide some "safe harbors" for the modeling and firm if/when a stress incident occurs.

In our Lyon “brainstorming session” we agreed to host a workshop with Columbia for the Spring on valuing illiquid assets”. And we’ll jointly work with Prmia on the research track for the ERM Symposium in April.

If anyone is interested in participating with one or more of the ERMII research groups on topics such as the treatment of risks with different time horizons in a market-consistent way, or the interplays between liquidity, market value and long-term value, and how one might value a series of deposits, as in a life policy. If anyone is interested in participating, let me know and I will get you in touch with the right folks. This would be another way to ensure you are incorporating state of the art research/techniques.

One last thought is that the ERM techniques described today and at other times during our meeting readily apply to non-financial services industries. Longer term, using our quantitative risk skills to expand into these other industries presents good growth opportunities for actuaries.

We certainly live in exciting times.....thank you