



SOCIETY OF ACTUARIES

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**RA2-Lessons from the International Regulatory  
Systems: What has Worked and What Hasn't?**

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## Lessons from the International Regulatory System



### What has Worked and What Hasn't

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Canada (OSFI)

## OSFI



An *integrated* regulator / supervisor. We supervise

- Banks and other deposit takers
- Insurance companies
- Pension plans

## Recent Canadian Experience



- Banks
  - Some losses, mostly related to US portfolios
  - Still able to raise fresh capital on the open markets
  - Remain well capitalized; Tier 1 ratio near 10%
  - Canada is the only G7 country that has not had to provide capital support to its banks

## Recent Canadian Experience



- Insurance
  - Some exposure to instruments issued by Wall St. firms – not very significant
  - Companies with variable annuities (segregated funds) are subject to increased capital requirements
  - Earnings are reduced

## Recent Canadian Experience



- Pension plans
  - Some significant defined benefit plans are, under current market conditions, somewhat underfunded
- Overall
  - We have come through fairly well
  - Our banking system is regarded as one of the strongest in the world
  - We gained new and valuable experience
  - As a result, much work remains to be done

## How people react to the crisis



- How long will we remember our recent bad experience?
- In good times, we
  - Are optimists
  - Don't believe bad times will come back
    - “We fixed the problems that caused the trouble last time”
  - Won't let doubt upset our business plans

## OSFI Encourages ERM



- We rate the quality of a financial institution's ERM
- Recent experience has shown ERM has not been implemented well in some cases
- However, ERM as a concept has not failed
- The supervisor's task in the future will be to get some institutions to take ERM more seriously than they have in the past

## Example - Credit Default Swaps



From New York Times Sunday Magazine – January 2009

- Wall Street traders compensated on basis of earning income without increasing the firm's risk
- Risk was measured by VaR
- The probability of a CDS coming into the money was judged to be beyond the VaR limit – CDSs appeared risk free
- Traders knowingly gamed the system

## Possible ERM Errors



- A failure on the part of senior management to recognize the limitations of VaR as a risk measure
- Lack of discipline with respect to the selection of assumed probabilities of default (disaster myopia)
- Insufficient monitoring of traders' activity

## Or, was it Management Error?



Another NYT story from January 2009

- Management removed risk managers from the trading floor
  - Changed culture so traders did not talk to risk managers
- Eventually, changed risk managers
  - New managers were more accommodating with respect to traders' activities

## Or, was it Management Error?



- Perhaps risk managers did actually recognize risk-related deficiencies but were ignored by senior management
- OSFI is aware of cases in firms with sophisticated ERM where warning was given by risk managers of significant risk but was ignored by senior management
  - Senior management ignored this and when the risk did materialize, was at a loss to explain how the firm's difficult situation developed
- In ERM, corporate culture is *everything*: if senior management doesn't buy in, ERM is of little or no value

## Financial Guarantees



In banking and investment banking, Credit Default Swaps

In insurance, segregated funds and variable annuities

- In both cases, assumed probabilities of guarantees coming into the money have been grossly underestimated
- Insurers initially regarded these guarantees as a throw-away and did not charge for them; they were treated merely as a selling feature

## Variable Annuities



- When capital requirements were introduced for these guarantees (2000 in Canada, later in the U.S, as C-3 Phase II), products were re-priced to earn the cost of capital
- Companies told us premiums were too low to support the cost of hedging
- Perhaps that was a signal that the financial markets thought the risk involved was considerably greater than insurers thought

## Should Insurers Offer VA Guarantees?



- Mutual fund companies do not offer them
- Banks only offer guarantees that they can hedge
- Insurers justify this business by arguing that
  - these are long-term guarantees; if markets fall, there is sufficient time for them to recover
  - the business of insurance is to take on risks

## Should Insurers Offer VA Guarantees?



- Insurers justify this business by arguing that
  - these are long-term guarantees; if markets fall, there is sufficient time for them to recover

BUT this does not hold up

- if markets fall just before guarantees are due to mature – the current situation for some companies, or
- if markets have bubbles that burst after guarantees have been issued (e.g. Nikkei, NASDAQ)

## Should Insurers Offer VA Guarantees?



- Insurers justify this business by arguing that
  - the business of insurance is to take on risks

BUT this confuses insurance and gambling

- Market guarantees are not insurable risks
  - claims are not independent
  - the Law of Large Numbers does not apply

## Dealing with VAs



- Recent experience has shown our methods for determining liabilities and capital for segregated funds and variable annuities are deficient
  - Same methodology as contained in C-3 Phase II
- To explain our concern, let's take a short excursion into the Canadian method of valuing life insurance policy liabilities

## CALM



- Canadian Asset Liability Method
  - gross premium method that accounts for all product related cash flows
  - includes cash flows from supporting assets
  - liability is greater when ALM is poorer
- Segregated funds / variable annuities is the only product type for which CALM is not used

## Seg Funds / VAs



- ALM for these products involves physical assets backing the guarantees as well as hedging
- The liability should reflect the risk inherent in not being perfectly hedged
- If the premium / fee charged is insufficient to meet the cost of hedging, this should be evidenced by a higher liability

OSFI is working on approaches to fix these deficiencies

## Cyclicalty of Required Capital



- Capital requirements have been shown to be, in some cases, very sensitive to changes in financial markets
  - some would say these requirements are too pro-cyclical
- Pro-cyclicalty may be painful but it is not necessarily wrong
  - although times may be bad, they can get worse

## Cyclicalty of Required Capital



- However, we can modify imperfect capital designs if they magnify the pro-cyclic effect unduly
- OSFI recently modified our capital requirements for segregated funds / variable annuities so as to use a lower CTE level for cash flows that occur sufficiently far into the future
  - note that the modification is based on the timing of the cash flows and not on the maturity date of the contract

## Counter-cyclical Required Capital



Can a counter-cyclical approach work?

- In good times, we suffer from disaster myopia
- A counter-cyclical requirement would require imposition of higher capital requirements in good times
  - when trouble appears remote
  - when business wants to expand
  - when shareholders want higher dividends
- The pressure on regulators to relent would be intense

## Counter-cyclical Required Capital



- Regulators' corporate memory of bad times would also fade, leading them to bend in the face of intense pressure
- If counter-cyclical elements were to be inserted into regulatory capital requirements, it would be best if they were formula- driven rather than subject to regulators' discretion

## Cyclical and Long-Term Guarantees



- We have not developed satisfactory methods for handling long-term risks
- Many of our risk managements are borrowed or adapted from financial economics, a field that has a relatively short time horizon
- There is a lot of fundamental thinking and development yet to be done

## Scenario Testing



- We do experience tail events that are not adequately covered by standard probability distributions
  - some would argue new tools are needed e.g. fractals (Benoit Mandelbrot)
- It may not be sufficient to look at distributions of a single variable
  - for example, the current crisis is the result of complex interactions of many variables
  - it may not be sufficient to consider multivariate models with interactions described only by correlations

## Scenario Testing



- To perform a credible ERM job, we must consider extreme and complex scenarios and understand their (financial) effect on the firm
- We need to construct explicit plausible and challenging scenarios
- We can also test different management strategies to react to and mitigate the situation and learn the company's weaknesses and strengths

## Scenario Testing



- Note that scenario testing does not give automatic answers to quantitative questions
  - it will not tell you if you have enough capital
- It provides food for thought
- It is exploratory in nature and answers questions beginning with “what if ...”
  - it will tell you if capital is sufficient to absorb a particular unfavorable experience

## Scenario Testing



- A proper scenario testing exercise requires
  - imagination
  - courageon the part of the risk manager
- Imagination to construct challenging and plausible scenarios
- Courage to overcome the indifference or disbelief of the audience

## Dynamic Capital Adequacy Testing (DCAT)



- An annual scenario-testing study is required of all insurance companies in Canada since 1992 (life) or 1998 (P&C)
- Governed by professional standards of practice and educational material provided by the Canadian Institute of Actuaries
- Has proved to be a valuable risk management tool when approached earnestly
  - but ineffective when approached as a compliance exercise

## Dynamic Capital Adequacy Testing (DCAT)



- Each actuary chooses scenarios that are thought to be most appropriate for the particular insurer
  - A lack of uniformity and complexity in the scenarios is a problem
- We are considering a plan to regularly publish specific scenarios which all insurers will test in addition to relevant company-specific scenarios
  - We are also considering testing more frequently than annually

## Scenario Testing



- The Swiss Solvency Test incorporates stress testing into regulatory capital requirements
- Ideally, scenario testing should at least be integrated into each company's determination of its own (economic) capital needs
  - supervisors could encourage this through Pillar II of a supervisory framework
- OSFI is considering steps in this direction

## Scenario Testing



- The Federal reserve Board is requiring major US banks to carry out specific stress tests
- Guidance for supervisors on stress testing has been prepared by
  - Basel Committee on Banking Supervision
  - International Association of Insurance Supervisors
- Guidance for practitioners is available from
  - Canadian Institute of Actuaries (DCAT standard and educational note)
  - International Actuarial Association – forthcoming

## Conclusions



- There have been weaknesses and some failures in the execution of ERM
  - ERM has not failed
  - The task of supervisors will be to have supervised institutions take ERM seriously, for their own benefit and not just for compliance
- Financial guarantees are risky and non-diversifiable
  - We are working on improving measurement of liabilities and capital requirements for these products

## Conclusions



- Capital requirements reflect economic scenarios
  - undue pro-cyclicality should be avoided
  - counter-cyclical elements are difficult to introduce and implement
- Scenario testing will become increasingly important as an ERM tool
  - some jurisdictions are introducing it as part of capital requirements
  - all insurers should use this technique in their own ERM

## Conclusions



- ERM is a human activity, subjective to our collective behavior and foibles
- We have to be vigilant and courageous
- We have to retain the memory of our financial history
- We must pass that memory on to future generations  
or, must they repeat our mistakes?

Thank You



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