Office of the Superintendent of Financial Institutions Canada | Bureau du surintendant des institutions financières Canada

Stress Testing: Insurance Companies in Canada

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Paper presented at the Expert Forum on Advanced Techniques on Stress Testing: Applications for Supervisors

Hosted by the International Monetary Fund

Washington, DC– May 2-3, 2006

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Canada

Office of the Superintendent of Financial Institutions Canada
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Presentation to IMF

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Dynamic Solvency Testing

Also known as:

- **Dynamic Capital Adequacy Testing (Canada)**
- **Dynamic Financial Condition Analysis (USA – life)**
- **Dynamic Financial Analysis (USA – P&C, stochastic)**

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Evolution of DST

- Canadian financial reporting changed to a GAAP basis
- Actuarial reserves were no longer “good and sufficient” but “appropriate”
- Risk-based capital requirement (MCCSR) was seen as static and retrospective
- There was a need for a dynamic and forward-looking study of a company’s financial condition

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Position or Condition ?

- ***Financial position*** **is a measure of a company's current financial state, as measured by its financial statements**

- ***Financial condition*** **is concerned with the state of a company's financial health, its ability to continue in business**

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Dynamic Solvency Testing

- Developed by the Canadian Institute of Actuaries (CIA) in the period 1987-1990
- Required annual test for all Canadian life insurers since 1992
- Required of P&C (general insurance) companies since 1998

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What is DST?

- **A process whereby the business of the company is tested through cash flow projections into the future under a variety of scenarios of possible (unfavourable) experience**

- **A process of *stress testing***

What is DST?

- **A process that allows for the testing of possible management strategies for handling adverse experience**

- **A *risk management* process**

How do we do DST?

Construct a computer cash-flow projection module of the company

- Include both assets and products
- Specify future experience factors
- Specify company operating policies
- Provide for revaluation of actuarial liabilities

Model Variables

- External environment – mainly economic, government actions, legal etc.
- Business experience – claims, productivity, sales, surrenders
- Business planning – investment, products, bonus, capital

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How do we do DST?

- Select the projection period
- Select the initial position
- Project under a specific scenario of future experience
- Prepare appropriate financial statements for all projection years
- Verify the company's financial position under this scenario

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Projection Period

- Canada:
  - Life insurance – 5 years
  - General (P&C) insurance – at least 2 years
- Period should be sufficiently long so as to allow time for trends to develop and management reaction
- For general insurance, consider the length of the business cycle

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The Company Model

- Usually based on a commercial modelling package
- Build the company in the model to reflect its internal organization or the financial reporting organization

The Company Model

- Products
- Assets
- New business
- Investment policy
- Bonus and dividend strategy
- Capital injections

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The Company Model

- **Check the accuracy of the model:**
  - Set the initial position as the position at the end of year Y-2
  - Use the known experience rates of year Y-1 as the scenario assumptions
  - Compare the projected results as of the end of year Y-1 with the known actual position at that time

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Operating Policies

- **Investment**
- **Asset/liability matching**
- **Pricing**
- **Sales**
- **Expense control**
- **Valuation of liabilities**
  - Assumptions appropriate to the scenario
- **Dividends or bonuses**
- **New capital**

Modelling Scenarios

- A change of scenarios will include a change of projection assumptions and of company policies
- Design the model so as to control and minimize changes necessary for a new scenario
- Use plausible adverse scenarios

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Choosing Scenarios

- **Basic risks**
  - Select those that are relevant for the company
- **Test ripple effects**
  - e.g. a change in economic scenario can affect disability rates, expense rates and investment income
- **Integrated scenarios**
  - Combinations of risks

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Basic Risks – Life Insurers

- Mortality
- Morbidity
- Persistency
- Cash flow mismatch
- Deterioration of asset values (credit risk)
- New business
- Expense
- Reinsurance
- Government and political action
- Off balance sheet

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Basic Risks – General Insurers

- Frequency and severity
- Pricing
- Misestimation of policy liabilities
- Inflation
- Interest rate
- Premium volume
- Expense
- Reinsurance
- Deterioration of asset values (credit risk)
- Government and political action
- Off balance sheet

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Selecting scenarios

- **Base scenario usually derived from the insurer's business plan – provides a standard of comparison**
- **Model management reaction to changes in experience**
  - Be realistic about this
- **Consider regulatory reaction**

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Policy Liabilities

- **Revalue liabilities within the model using assumptions appropriate to the emerging experience in the scenario**
  - Provides for an (indefinite) continuation of adverse scenario experience
  - Necessary to produce appropriate financial statements and measures of capital adequacy

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Stochastic DCAT

- **It may be desirable to test certain factors with randomly generated scenarios derived from a known distribution**
  – Economic variables
  – Claims (general insurance)
- **For general insurance, this is DFA**
  – Useful for pricing

Stochastic DCAT

- **Stochastic methods require greater attention paid to algorithms describing business volume, pricing, expenses, investments, …..**
- **Data storage becomes a problem**
- **Use caution in interpreting the results:**
  - use appropriate risk measures
  - Remember the technical competence of the reader

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The Actuary's Report

- **Directed to senior management and boards of directors**
  - The audience does not consist of actuaries; external board members may not have a sound understanding of the insurance business
- **Convey meaningful information in a manner that is interesting to the reader**

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The Actuary's Report

- More than an analysis of projections
- History of company's progress – capital ratios for recent years
- Discussion of company's condition
- For significant scenarios, test possible management reactions
- Make recommendations
- Progress on past recommendations

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The Actuary's Report

- **Supply selected financial information**
  - balance sheets
  - Income statements
- **Discuss regulatory and rating agency implications**
- **Confirm compliance with professional and regulatory requirements**

The Actuary's Opinion

- **CIA standards for satisfactory condition**
  - Base scenario: exceed minimum statutory ratio at all times
  - Other scenarios: positive ratio at all times on reported scenarios
- **In Canada, the actuary must sign a formal opinion**
- **The financial condition report is a confidential document**

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The Canadian Experience

- Wide variation in quality of reports
- Some see this as an important management tool
- Others see this as a compliance issue

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OSFI views on DCAT

- OSFI regards financial condition reports as an important risk management tool
- Past surveys indicate less than 50% of reports are of value to an external director
- CIA is revising its paper to provide better guidance to its members
- OSFI will rate reports and use this in its risk rating of the company

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Website: www.osfi-bsif.gc.ca