Time Horizon Solved!

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27 September 2006
Hilton Vienna Hotel, Am Stadtpark
Time Horizon Solved!

Agenda:

- Context
- Time Horizon
- Questionnaire
- Model
- Conclusions
Context

- What are we considering?
  - Risk-Based Capital assessment
  - Impact of Time Horizon
  - Underwriting risk only
- What are we **not** considering?
  - Calculation of individual risks
  - Aggregation of risks
Context

- Capital Assessment
  - Risk Profile (e.g. retained earnings distribution)
  - Risk Measure (e.g. VaR)
  - Risk Tolerance Level (e.g. 99.5%)

- Risk Profile considerations
  - What risks are we trying to capture? [going-concern, run-off]
  - Basis for quantification (e.g. regulatory, cashflow)
Time Horizon

- No common definition of Time Horizon,

- but, various elements to consider, including:
  - Risk Identification issues
    - *New Business Period [short/medium/long term risks?]*
    - *Allowance for run-off costs*
  - Risk Quantification issues
    - *Projection Period*
    - *Recognition of run-off costs*
Time Horizon

- and dependent on purpose of capital assessment:
  - Business planning / strategy
  - Rating agency assessment
  - Regulatory assessment
  - Due diligence
  - Other (e.g. Pricing, RI assessment, Asset allocation)
Questionnaire
Aims

- Understanding
- Agreement / Divergence
- Inputs for model
Questionnaire
Results: Background of respondents

- Total Number of responses: 153
Questionnaire
Results: Background of respondents

- Total Number of responses: 153

![Chart showing the background of respondents: 80% are part of a financial services group, and 20% are pure general insurers.]

The Actuarial Profession
making financial sense of the future
Questionnaire
Results: New Business Period

Variable

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Questionnaire
Results: Projection Period

- 20+
- 16-20
- 11-15
- 6-10
- 5
- 4
- 3
- 2
- 1

0% 5% 10% 15% 20% 25% 30%
Questionnaire
Results: Reserve recognition

Develop

Immediate
Questionnaire

Results: What confidence level do you use at the end of the Projection Period?

- Sloping
- 95.00%
- 97.50%
- 98.50%
- 99.50%
Questionnaire Results: Is your confidence level a function of the:

- **Projection Period**
- **New Business Period**
Model
Aim

- Potential impact on capital assessments from:
  - Different views of time horizon
  - Different risk tolerances
Model Assumptions

- Risk Profile
  - Underwriting risk only / No investment income
  - Going Concern
  - Calculation basis: cashflow
  - 6 worst simulations (cashflows of losses)
  - Cashflows assume Perfect Foresight
  - Recognition assumption 60%, 80%, 90%, 100%
  - New business assumed to increase capital (may not always be the case)

- Risk Measure
  - Value at Risk
## Model

### Example Assumptions (1 yr new business)

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### Recognition To Ultimate

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### Expected Ultimate

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Model
Variables

- Risk Profile (Time Horizon)
  - New Business Period: 1 year, 3 years, 5 years
  - Recognition: Immediate, Develop over time
  - Projection Period: 1 year, 3 years, Complete Run-off
  - Calculation basis: Going concern, run-off

- Risk Tolerances
  - 99.5%, 98.5%, 97.5%, Sloping (100% - t*0.5%)

- 144 combinations!
  (but significant number discarded)
Variability of model results to input assumptions

- Capital amount varied from 1,141 to 4,849

- Variables for these extremes were:
  - 1,141: (1 NB, 1PP, CI 99.5%, Recognition over time)
  - 4,849: (5 NB, 5PP, CI 99.5%, Recognition immediately)

- NB: Different assumptions, different results!
Results from the Questionnaires
Conclusions
Time Horizon considerations

- Affects risk profile in numerous ways
  - New Business Period
  - Projection Period
  - Claim Recognition

- Purpose of capital assessment

- Impact on capital assessment can be dramatic
Conclusions
Time Horizon solved?

- Solvency 2!
Further Questionnaire Results
Questionnaire
Results: Allowance for claim run-off?

No allowance
Implicitly
Projected to expiry
Projection Period + commutation

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0% 70.0%
Questionnaire
Results: Going concern or run-off?

Going Concern

Run-off

0% 10% 20% 30% 40% 50% 60% 70% 80%
Questionnaire
Results: Allowance for unexpired risks?

- Yes: 80%
- No: 0%
Questionnaire
Results: Calculation Basis

![Bar chart showing results for different calculation bases: Regulatory, Economic, UK GAAP, Cashflow, Other. Regulatory has the highest percentage.]
Questionnaire

Results: Solvency assessed at the end of each Projection Period?
Questionnaire

Results: Which Projection Period produced the highest result?

- “Depends” was a common answer!
  - 1 year if risks considered to ultimate straight away
  - Longer period if no management actions allowed for
  - Depends on profitability of new business assumed

- Overall feedback was limited
  - Roughly 2/3nds stated that applying more than 1 projection period produced a higher result
Questionnaire
Results: Any other comments

- In practice a variety of approaches are used
- Allowance for the underwriting cycle?

- We spelt conundrum incorrectly!