The Actuarial Profession
making financial sense of the future

33rd ANNUAL GIRO CONVENTION

Hilton Vienna Hotel, Am Stadtpark

Capital Structures In Insurance

- **So, you have calculated your ICA**
- **And the FSA have given you some ICG.**
- **What happens next?**

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Focus on Economic Capital: Agenda

- Properties of capital allocation
- What capital to allocate
- How to allocate
- Shareholder vs. policyholder perspective
- Business performance
- Strategic planning
- Implementation

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Properties of Capital Allocation

The following properties are considered desirable for an Allocation Method:

- Gives stable results
- Capable of ready communication
- Passes common sense tests
- Allows for differences between lines of business (eg long / short)
- Reflects management view of risks
- Coherent in mathematical sense

What Capital to Allocate?

Possible choices

- Total Shareholder Funds
- ICA (Adjusted for Risk Tolerance?)
- ICG
- Rating Agency target capital
- Combined Risk of Underlying Distributions
- Diversification benefits?

Choice is not vital, hurdle rate can be adjusted so that all capital is serviced at required rate.

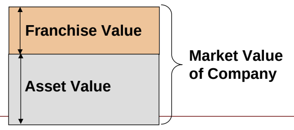
Investment Risk

- Arguably Investment Risk is fully diversifiable by Shareholders and so taking Investment Risks adds no value.
- Create benchmark portfolio – matched to liabilities, surplus held in cash.
- Assess capital needed for Investment portfolio against this benchmark.
- Deduct Investment capital from total. Plays no further part in this analysis.

How to Allocate Capital

- PURPOSE PURPOSE PURPOSE
  - One Size does not fit all

- Traditional allocation methods focus on tail of distributions – policyholder perspective.
- Shareholders more concerned with Franchise Value, i.e. care about all losses over short term.

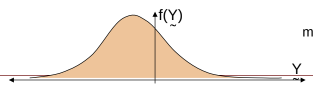


How to Allocate Capital (continued)

- Allowing for profitability in allocation can mean:
  - unstable allocations through rating cycle;
  - very low allocations to (temporarily) very profitable business.
- So make adjustments to traditional allocation methods.

Let $\tilde{X}$ be simulated one-year profit / loss

- Adjustment 1: Use statistic $\tilde{Y} = \tilde{X} - E(\tilde{X})$ (eliminates profitability)
- Adjustment 2: Use TVAR (60%) on Y to allocate capital to lines (allows for all losses, not just tail)



mean ($\tilde{Y}$) around 60th Percentile

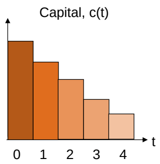
How to Allocate Capital (continued)

Two Broad Approaches

Method	Description	Comments
Top Down (e.g. Conditional TVAR)	Each line is allocated its contribution to aggregate loss.	All capital is allocated. Small diverse lines receive very low allocations. Allocations to line can be unstable.
Bottom Up	Each line is treated independently. Allocation is in proportion to each line's loss.	Scaling is needed to allocate all capital. Stable 'common sense' allocations.

Pricing, Business Performance and Reserves

- In pricing allow for capital charge.
- One method:
  Capital charge = $\Sigma\ v^t.j.C(t)$
  where C(t) is capital held at time t
  v^t is a risk free discount rate
  J is frictional cost of holding capital
- As capital is needed for many years, wrong to release all of capital change at end of year 1.



- Implies reserve margin at end of year 1 should be $\sum_{t=1}^{\infty} v^{t-1}.j.C(t)$
- Note if reserves were held like this, discontinued business would generate a return on capital.

Business Performance

- Ideally would like to restate reserves as above. Difficult to implement in practice. Remains to be developed.
- But we do make two adjustments to pure accounting numbers:
  - Discount reserves
  - Eliminate any movements in reserve margins.
- Return on capital calculated (ROCA) post these adjustments.

$$\text{ROCA} = \frac{\text{accounting profit} \pm \text{adjustment} + \text{notional investment return}}{\text{capital allocated}}$$

Strategic Planning

- For strategic planning impact of diversification is critical.
- Use combination of bottom up and top down views in the analysis.
- Must allow for any goodwill involved in any transaction.
- Must allow for non-economic capital measures.

Implementation Challenge

- The hard bit!
- Communication is key. Message will need to be relayed many times.
- Depth of communication within the organisation needs to be determined.
- Avoid Big Bangs! Gradual implementation, parallel reporting, work through issues.

Summary

- There is no right or wrong way to allocate capital. Need system that works for you and gives common sense results.
- Communication of results likely to benefit from consistent and regular messages.
- Implement carefully.