

Insurance Capital

Presentation to ALMA

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Agenda

- The Insurance Business
- Capital Issues
- ICAS
- Allocation of Capital
- Questions (hold to end please)



The Insurance Business

- Add value by pooling risks
- Underwriting is the process of assessing and pricing risk
- Take on insurance risk within risk appetite
- Claims management is a customer servicing opportunity
- Exposure to low frequency/high severity events



Examples of low frequency/high severity events

- WTC Attack – insurance losses c \$50b
- Hurricane Katrina – losses c \$60b
- Buncefield – losses c £1b
- Selby rail crash – cost c £35m. Premium £500

Risk mitigated using reinsurance. Introduces credit risk.



The Insurance Business - Finance

- Receive premium up front
- Need to set up Provisions (Reserves)
 - Premium reserve: for “unearned” exposure
 - Claims reserve: for reported but not settled claims
 - Incurred but not Reported (IBNR): for claims not yet reported
- Some classes of business have a “long tail”.
- Reserving is an imprecise process – need capital above reserves to meet unexpected losses



Balance Sheet (R&SA Group – end 2005)

Assets

Investments	15.6
Reinsurers share of reserves	4.4
Debtors and other assets	4.6
Total	24.6

Liabilities

Equity	3.1
Debt (Subordinated)	1.1
Reserves	17.2
Creditors and other liabilities	3.2
Total	24.6



Capital Management Challenges

- Statutory (Solvency I)
- Other Statutory (NAIC, Canadian, etc.)
- Groups Directive
- Rating Agency
- ICAS
- Economic Capital
- Solvency 2



- Address usual main risk categories: insurance, credit, market, operational, liquidity.
- Risks interact – large insurance loss could impact credit risk
inflation impacts investments and claims
- Use integrated model for all risks (except Operational)
- Focus on total balance sheet, not just excess over booked reserve

Focus on Economic Capital: Agenda

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



Why Allocate Capital

- Management can use scarce resource for highest return
- Stakeholder pressure
 - Share analysts
 - Rating Agencies (eg S&P ERM)
- Growth
 - More efficient reinsurance



Properties of Capital Allocation

The following properties are considered desirable for an Allocation Method:

- Gives stable results
- Capable of ready communication
- Allows for differences between long-tail and short tail lines
- Reflects management view of risks
- Coherent in mathematical sense



What Capital to Allocate?

Possible choices

- Total Shareholder Funds
 - might be unstable
- ICA
 - likely to be stable, but long term FSA measure
- ICA adjusted for Company risk tolerance
 - still long term
- Rating Agency target capital

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



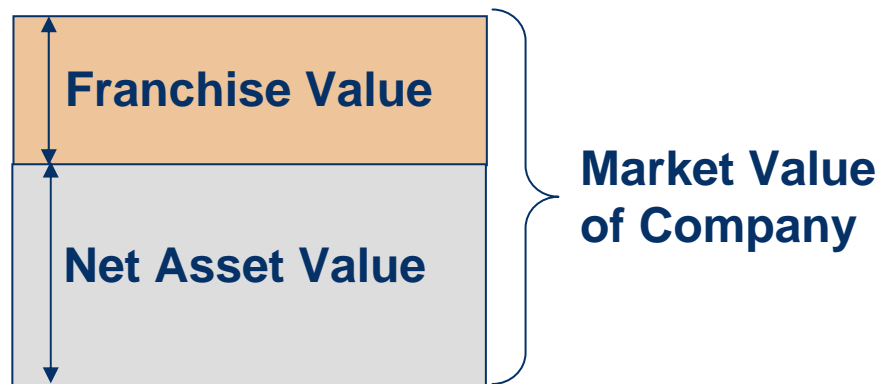
Investment Risk

- 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

- Choice of method depends on purpose.
- We want same method for business performance and pricing purposes.
- Allocate to line of business
- May need alternative method for strategic planning.
- 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.

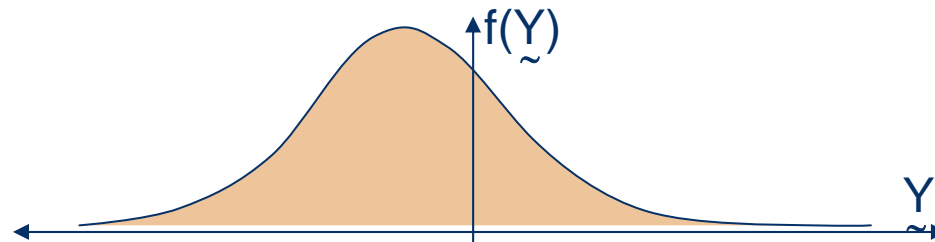


How to Allocate Capital (continued)

- 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 \tilde{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

<u>Method</u>	<u>Description</u>	<u>Comments</u>
Top Down (e.g. Aumann Shapley)	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.

We use the Bottom Up approach for pricing / business performance purposes.

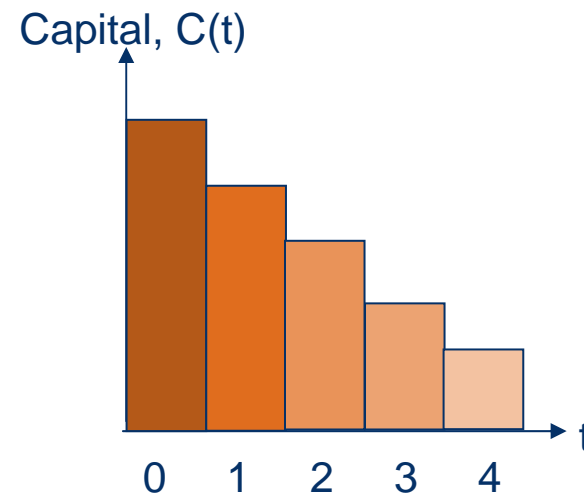


Pricing, Business Performance and Reserves

- In pricing allow for capital charge.

- One method: Capital charge = $\sum_{t=0}^{\infty} v^t \cdot j \cdot C(t)$

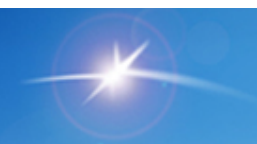
- where $C(t)$ is capital held at time t
 v^t is a risk free discount rate
 j is frictional cost of holding capital



- As capital is needed for many years, wrong to release all of capital charge at end of year 1.

- Implies reserve margin at end of year 1 should be $\sum_{t=1}^{\infty} v^{t-1} \cdot j \cdot C(t)$

- 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.
- Possible people issues.
- Implement carefully.

