Capital Allocation – Should we open Pandora’s Jar?

Andrew McGuinness, Willis Towers Watson
Martin Muir, Aviva
The “Theory” Bit
Andrew McGuinness
Another allocation talk? Why now?

**European market – shift in focus post Solvency II**
- Market practice has generally converged
- BAU: stop “building” and start “using”

**Changing market conditions**
- Challenging conditions
- Focus on Value
- Analytics increasingly important – internally and externally
- Changing economy:
  - InsureTech
  - Disaggregation
  - Disintermediation

**Technology continues to advance**
- Take a sledgehammer to the toughest of nuts

**Theory vs Practice**
- Explosion of theory a decade ago
- Applications in practice have moved on little
- Time to open up the debate again!
Back to the fundamentals

Risk Owners (indemnity seekers)
Choose to Accept, Mitigate or Transfer

When we set Capital we look at:
• Risk profile
• Risk measure
• Risk tolerance
• For a given time horizon

What is Capital?
• General risk-absorbing capacity, or
• A collection of physical instruments on a balance sheet

Deployment
• The value of risk is not symmetric (cost of capital is undertaking-specific)
• In practice, the capital base of an undertaking is not easy to change in the short term, so it provides a constraint

What do we want from an allocation?
• Relationship to risk measure and risk appetite
• Appropriate consistency over time for the same risk
• Ability to deal with the time horizon for different risks
• “Coherence”, which has been formally described through:
  – Full allocation
  – No undercut
  – Symmetry
  – Riskless allocation
• No gremlins lurking in the mathematics
• Ability to implement with current models
Methods aplenty

- Some of these have flavours
- Some are general principles that yield others as specific cases
- Some of them are just different names for the same thing
- They have all been talked-up and dressed-down
- And there are many more!

The multitude of allocation methods proposed in the literature is bewildering. Allocation methods are sometimes proposed in an ad-hoc fashion lacking usually with much economic justification and are thereby viewed as arbitrary. This motivated some authors to doubt the legitimate purpose of the exercise itself of allocating capital … Certain allocation methods may be best suited in order to address specific issues, but it is always unclear what these issues are…certain allocation techniques can dangerously lead to wrong financial decisions."

- From ‘Optimal Capital Allocation Principles’, Dahene et Al, 2009
Reviewing the literature

Overview
There are 4 main streams in the literature:
• Co-operative game theory
• Performance/portfolio management
• Market valuation of assets & liabilities
• Optimisation

Practical Takeaways
“Flurry of activity” a decade ago, picking up again recently
Papers often aimed at addressing the shortfalls of methods so far
Realistic examples are relatively scarce
Slow groundwork – academics tend to worry about housekeeping
Bibliography and my potted summary notes can be found with the slides on the GIRO website

Recent Highlights
• Furman et Al (2018)
  – Analyse the Weighted Insurance Pricing Model under multiplicative and additive systematic-risk frameworks
  – Quite “useful” distributions allowed for
  – Dependency through explicit effects – analogous to CAPM
• Boonen et Al (2017)
  – Capital allocation with non-linear risk aggregation
• Major (2018)
  – Allocation for financial derivatives of some underlying e.g. reinsurance recoveries
  – Relies on homogeneity of the operator
• Tsanakas et Al 2018 (preprint)
  – Allocation of net rather than gross total
Theory vs. practice

By the “no free lunch theorem”, there is never going to be one best method for all circumstances

Capital allocation is not an end in itself – the reason behind allocation should drive the choice of methods

What business problems are people using capital allocations for?

• Filling in regulatory returns
• Understanding the behaviour of the internal model / validation
• Business planning / strategy
• Pricing
• Performance management

Challenges:

• Nitty-gritty e.g. separating insurance and market risk on discounted profits
• The time horizon
• Expert judgement and its impact

Market practice: which methods are popular?

The following relatively non-exotic methods seem to be dominant:

• Haircut (or pro-rata)
• Co-TVaR
• Kernel (or Fuzzy VaR or Spread-VaR)

Most current models use Monte Carlo simulation – so any method needs to be amenable to simulation output

Often we hope to fit an allocation method onto an arbitrary model – maybe that’s asking too much

It can be difficult to frame many business questions in a “model world”

A common question I get asked is whether market practice has moved on to something more exciting, to which my common answer is “no, but maybe it should!”
Where do we go from here?

• Call to arms – don’t give up!

• Some methods have nicer theoretical properties than others
  – Just changing your allocation method won’t help you
  – But why not experiment a little?

• I think there is an opportunity for research on the whole process (not just the allocation methods)

• We will need to change our models as the world moves on
  – Usefulness for allocation should be a design consideration
The “Practice” Bit
Martin Muir
What do we mean by capital allocation?

Deploying to and releasing capital from:

<table>
<thead>
<tr>
<th>Markets</th>
<th>Products</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Flag" /></td>
<td><img src="image2" alt="Icon" /></td>
<td>Debtholders</td>
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<tr>
<td><img src="image3" alt="Flag" /></td>
<td><img src="image4" alt="Icon" /></td>
<td>Shareholders</td>
</tr>
<tr>
<td><img src="image5" alt="Flag" /></td>
<td><img src="image6" alt="Icon" /></td>
<td>Pension scheme members</td>
</tr>
</tbody>
</table>

Objectives:

- Support the strategy
- Drive better financial outcomes

“The root of my success is acting rationally about capital allocation.”

Warren Buffet, CEO Berkshire Hathaway
Where is capital allocation used?

Decision-making
Measuring performance
Strategy and planning
What measures are needed to allocate capital?

Do we need another measure?

- We already have many! Want greater simplicity not additional complexity
- Finance and Risk may enjoy using it, but how will the Business understand and use it?

<table>
<thead>
<tr>
<th>Measure</th>
<th>Growth Oriented</th>
<th>Wide Application</th>
<th>Risk &amp; Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Profit</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
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<tr>
<td>Operating Capital Generation</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
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<tr>
<td>Value of New Business</td>
<td>🟢</td>
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<tr>
<td>Net Written Premiums</td>
<td>🟢</td>
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<tr>
<td>Combined Operating Ratio</td>
<td>🟢</td>
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<tr>
<td>Cash Remittance</td>
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</table>
Practical considerations just as important

Easy to calculate  Easy to understand  Robust
Capital allocation metrics

What’s the right type of metric?

<table>
<thead>
<tr>
<th>Return on capital</th>
<th>Profit / Required Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value added</td>
<td>Profit – Cost of Capital</td>
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</tbody>
</table>

Need a measure of value and a measure of capital
Technical choices (1)

What’s the right value measure?

Economic vs Accounting

Own funds starting point

DVA, UFR etc

TMTPs

Risk margin

Fund management vs life

Contract boundaries

Staff pension scheme, RFFs
Technical choices (2)

What’s the right capital measure?

- SII vs Internal model
- Risk appetite (+)
- Dividend constraints
- Group v solo diversification
# How we use it - examples (1)

## Metric

<table>
<thead>
<tr>
<th>Cash payback (years)</th>
<th>EVA +ve @ WACC of swaps plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>No escalation required</td>
<td>Less than X years</td>
</tr>
<tr>
<td>Local CFO escalation</td>
<td>X-X years</td>
</tr>
<tr>
<td>Group escalation</td>
<td>More than X years</td>
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</table>

## GI product EVA

### Lifetime EVA vs initial capital strain (gain)

![Graph showing lifetime EVA vs initial capital strain (gain) for Life and GI products](image)
How we use it - examples (2)

M&A

[Chart showing Own funds movement and EVA over years Y1 to Y12]

- Purchase price
- Own funds acquired
- "Initial" EVA
- SCR at acquisition
- Diversification benefit
- "Day 1" Group S2 impact

PV EVA - 8%
PV EVA - 9%
PV EVA - 10%
How we use it - examples (3)

BU performance

![Graph showing BU performance](image-url)
Embedding it

Be pragmatic
- Use readily available numbers
- No new complex concepts
- Proportionate approach

Stakeholder Engagement
- Early consultation, let people help shape it
- Demonstrate the business value
- Compromise! Don’t ignore concerns

Education
- Internal training
- Be able to pitch at different levels
- Repeat and persevere!
Market focusing on sustainable growth

Gaining traction with analysts, gradual shift from an IFRS to an S2 lens

Solvency II valuation – Price to shareholder Own Funds vs operating return on FY17 Own Funds (%)

The ability for insurers to demonstrate underlying growth in Own Funds could increase in prominence for investors

Operating return on Own Funds is an under-appreciated metric in our view

Source: UBS research, company data, Solvency and Financial Condition Reports (SFCRs), Datastream, all local currency, FY17 Own Funds

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