




**The Actuarial Profession**

making financial sense of the future

Life Conference 2010

Neil Chapman and Edward Conway



## Meeting the challenges of developing an internal model

---

# Background

---

- Satisfying the FSA's pre-application process Qualifying Criteria was just the first of many challenges that companies developing internal models under SII face
- This session considers:
  - what lessons can be learnt from the experience to date; and
  - how best to meet the future challenges that lie ahead

---

# Lesson 1 – Importance of having clear objectives

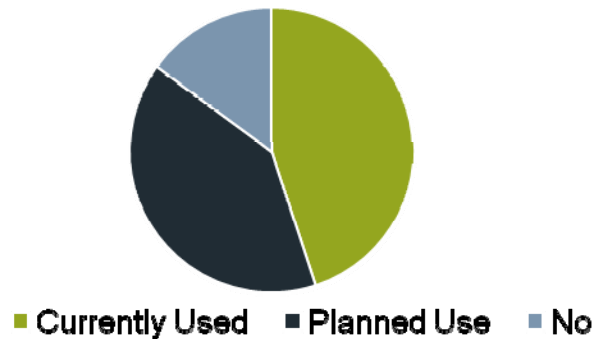
---

- Designing an internal model requires a clear understanding of:
  - Uses it will be put to and how the company is managed
  - Level of granularity needed
  - Outputs required
  - Frequency / speed requirements
  - Level of accuracy / materiality needed
- Lack of clarity over the final SII requirements is a handicap

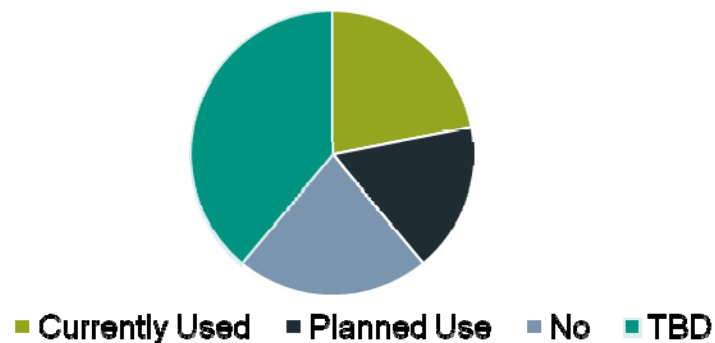
The clearer the end goal the easier and more efficient the development will be

# Examples of how companies intend to use their internal models

Will IM be used for strategic decisions such as M&A and ALM?



Use of IM for remuneration decisions



- Questionable how an IM can pass the use test if it is **not** used for strategic M&A and ALM decisions
- Many companies still have some work to clarify all the uses their IM will be put to

## Lesson 2 – FSA have to date driven the agenda



Solvency 2 – Internal Model Approval  
Process (IMAP)  
Pre-application qualifying criteria  
assessment template

Firm name	
Date of completion	
Firm contact details	

... resulting in significant work (and a lot more to come) and company focus on project management ...

... but less focus on strategic considerations such as capital structure, product design and pricing, tax, etc

---

## Lesson 3 – The surge in demand for resources is happening

---

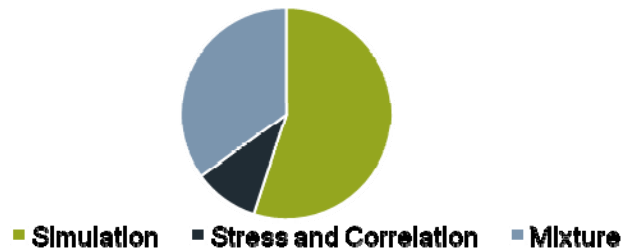
- Demand for SII resources is significantly outstripping supply
  - Companies are having difficulty filling SII project roles
  - Companies are having to pay higher salaries to recruit
  - Staff are resigning to become contractors similar to the Pensions Review work
  - Increased demand for consultant “secondment” both SII and business as usual
- Still need to do business as usual

**A key success criteria will be getting the resources needed  
and keeping hold of them**

# Lesson 4 – Technical development is a key focus

More sophisticated calculation and aggregation techniques are being used...

## Overall Aggregation Approach



## Market Risk Aggregation



... which require faster run times

Proxy models are also being improved to significantly enhance risk management and solvency monitoring information

## Modelling Approach for Market Risk



## Key Considerations

Accuracy and robustness of proxies

Recalibration requirements

Sensitivity to calibration space of initial inputs – can they reliably be used for ‘what-if’ scenarios outside the calibration set?

# What will be the key challenges?

## “Narrower” Challenges

- 1 **Validation and Data Quality**
- 2 **Uncertainty:**  
Over final SII requirements and tax basis
- 3 **Statistical quality:**  
Limited availability of data, relevance of the standard formula assumptions?
- 4 **Documentation:**  
and on-going maintenance and development



Most focus to date here...

## Broader Challenges

- 1 **Delivering within Budget**
- 2 **ORSA:**  
Uncertainty, overlap/integration with IM, projecting NB and future balance sheets
- 3 **Board Engagement:**  
Communicating relative shifts between standard formula and IM – has the cost-benefit shifted?
- 4 **Organisation change:**  
Embedding and defining three lines of defence. Understanding the merits of different corporate structures post SII?
- 5 **Reporting and Disclosure:**  
Explaining the IM to analysts/media and investors.



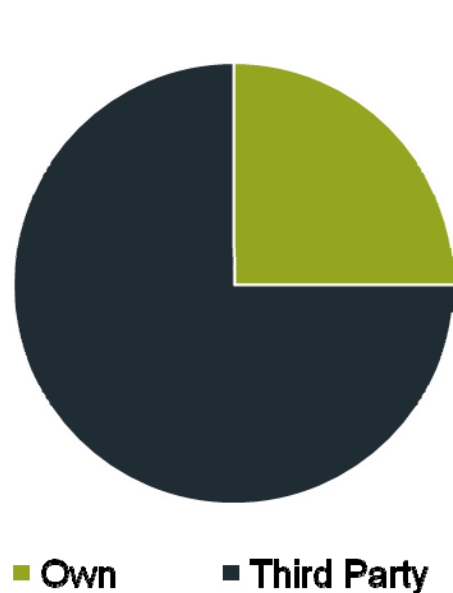
...but most of the risk lies here



# 1 Data quality and validation

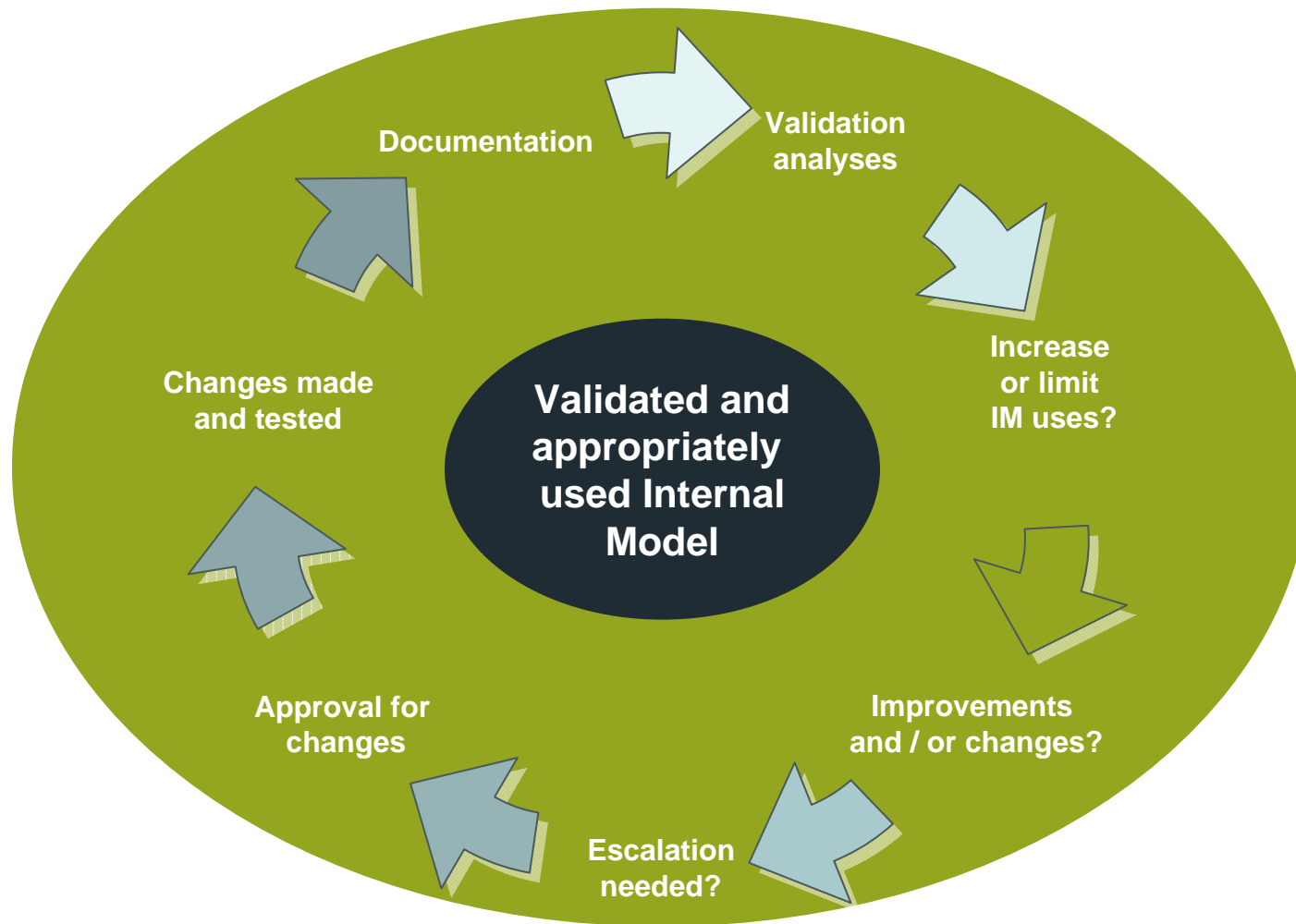
- Lessons from Basel II :
  - Improving data quality takes significant time
  - In general issues here cannot easily be solved by increasing resources committed

## Example – Validation of Third Party ESGs



- Most companies expect to use a third-party calibration
- Do companies have the intellectual capital to validate effectively?
- Will the market force discipline on providers to improve disclosure/validation?

# 1 A continuous cycle of IM validation is needed



1

## IM validation is likely to be a lot more involved than current ICA validation exercises

1. No more than the 100% of the ICA effort



2%

2. Between 100% and 150%



15%

3. Between 150% to 200%



22%

4. Between 200% to 250%



26%

5. More than 250% of the ICA effort



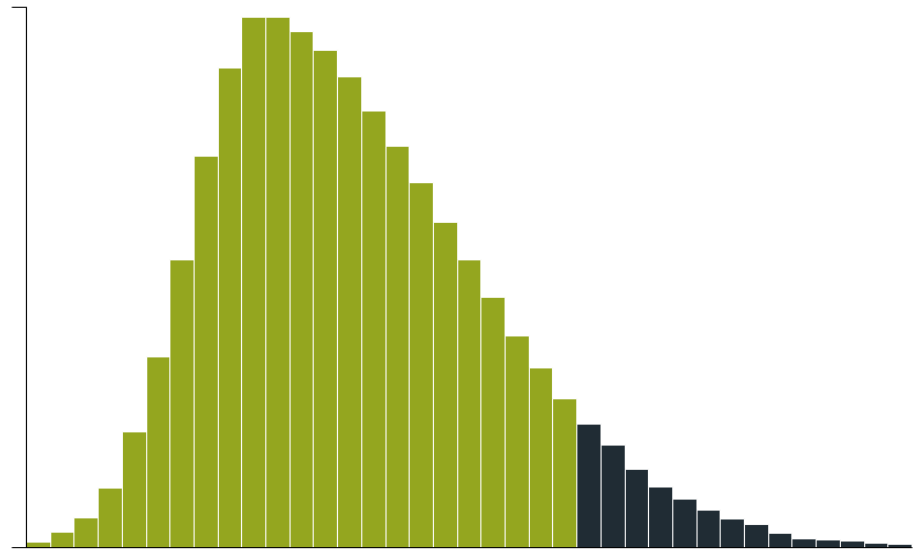
35%

Source: Towers Watson 22 April 2010 Inforum

3

## If interpreted strictly the statistical quality test could be impossible to meet

- Can a 1 in 200 stress be set with any certainty?
- What about operational risk in particular?
- Will the standard formula effectively set a floor for assumptions?



**The key criteria should be improved quantification  
not statistical certainty**

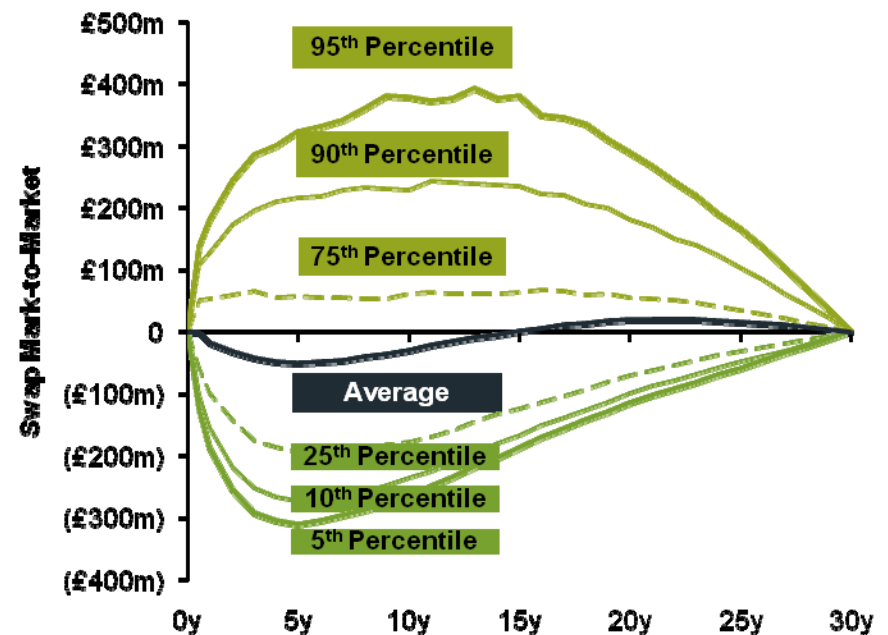
## 2 The ORSA: Overlaps and role of the internal model

- Additional risks covered by the ORSA?
- Role of the internal model in measurement?

### Example: Liquidity Risk

- Increasingly relevant under Solvency II given:
  - Increased use of derivatives
  - (Unrelated) moves to derivatives through clearing houses, standardised CSAs and daily collateralisation
- Not appropriate to hold capital against liquidity risk, so not included in SCR...
- ...but clearly can be measured – should be part of the ORSA
- Natural use for an internal model – but is it in current specifications?

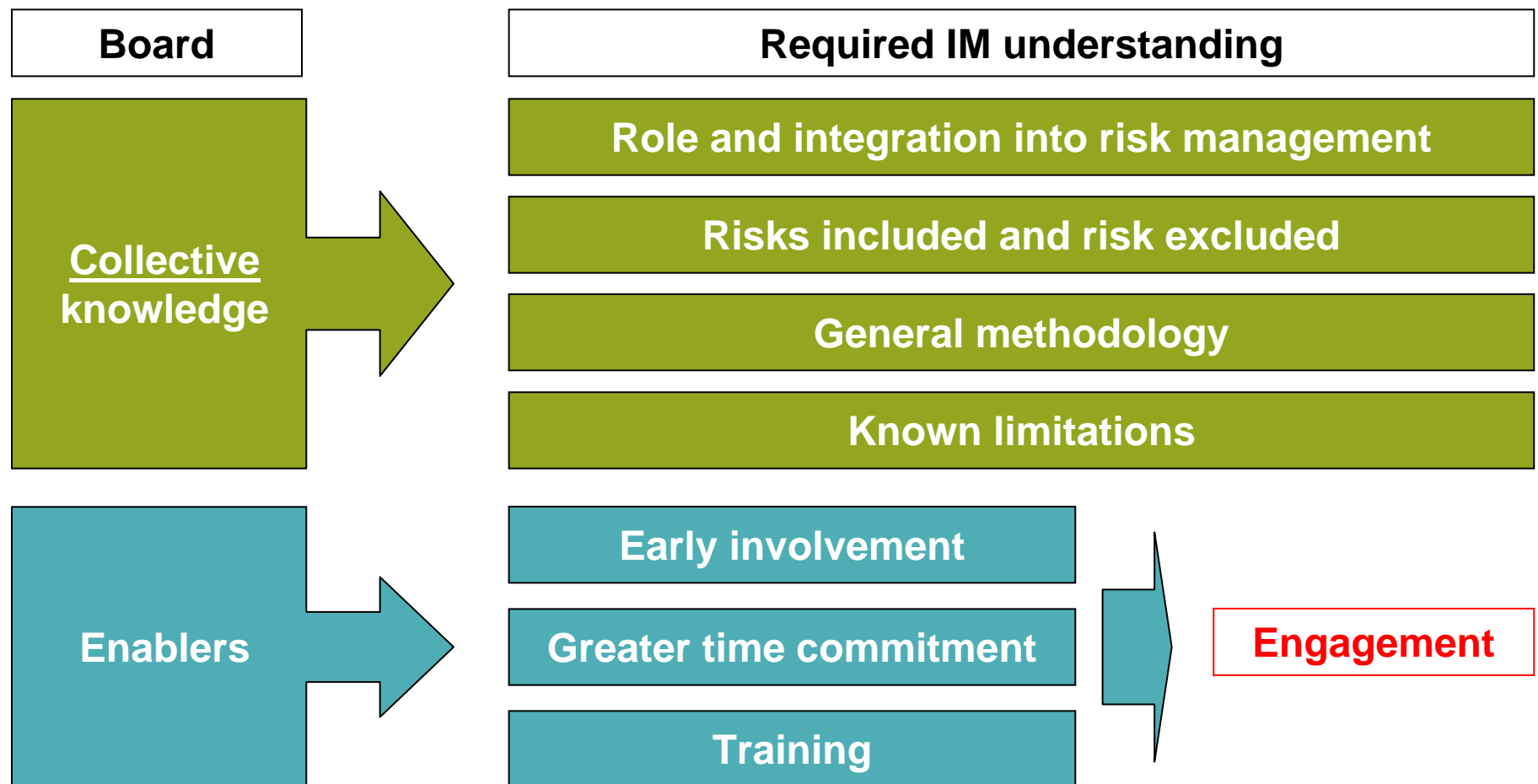
30y Fixed-Rate Receiver Interest Rate Swap (£1bn Notional)



**Cash margin calls can potentially be large**

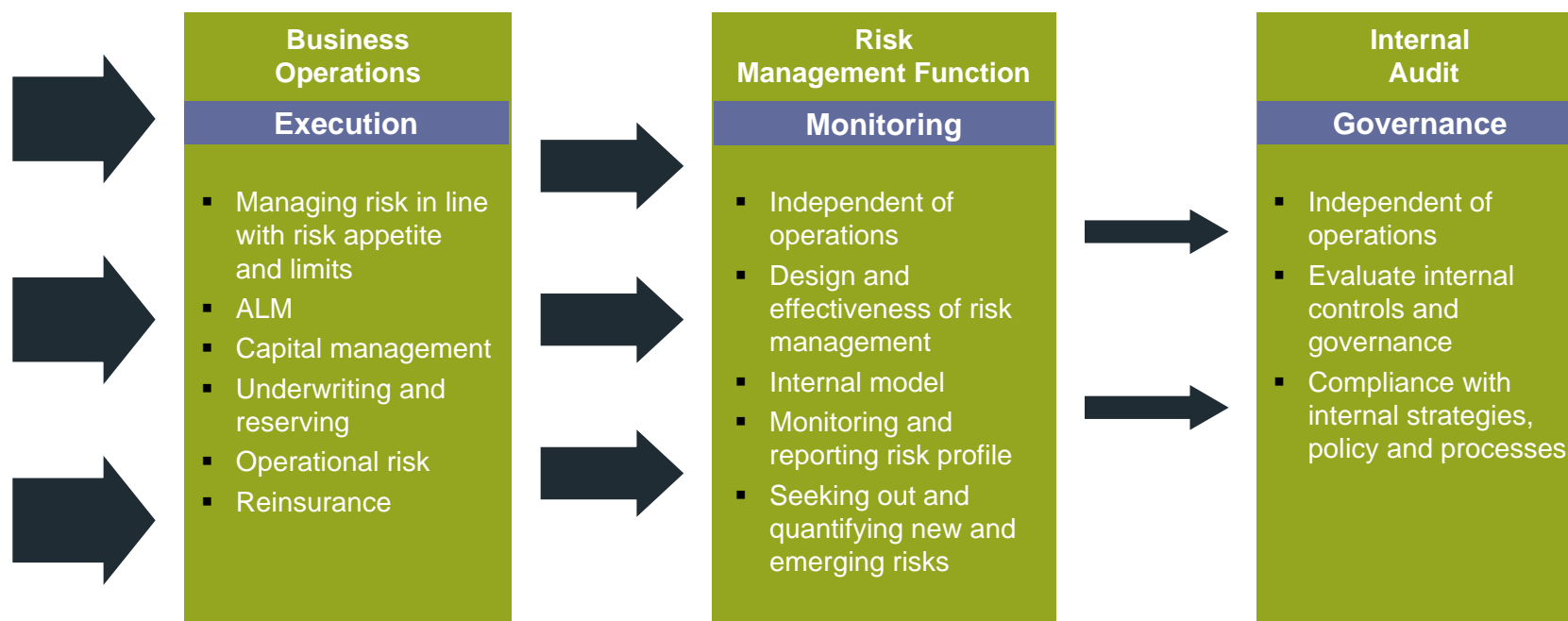
Source: Goldman Sachs

### 3 Getting the Board fully engaged will be critical



## 4 Risk governance is likely to need to evolve

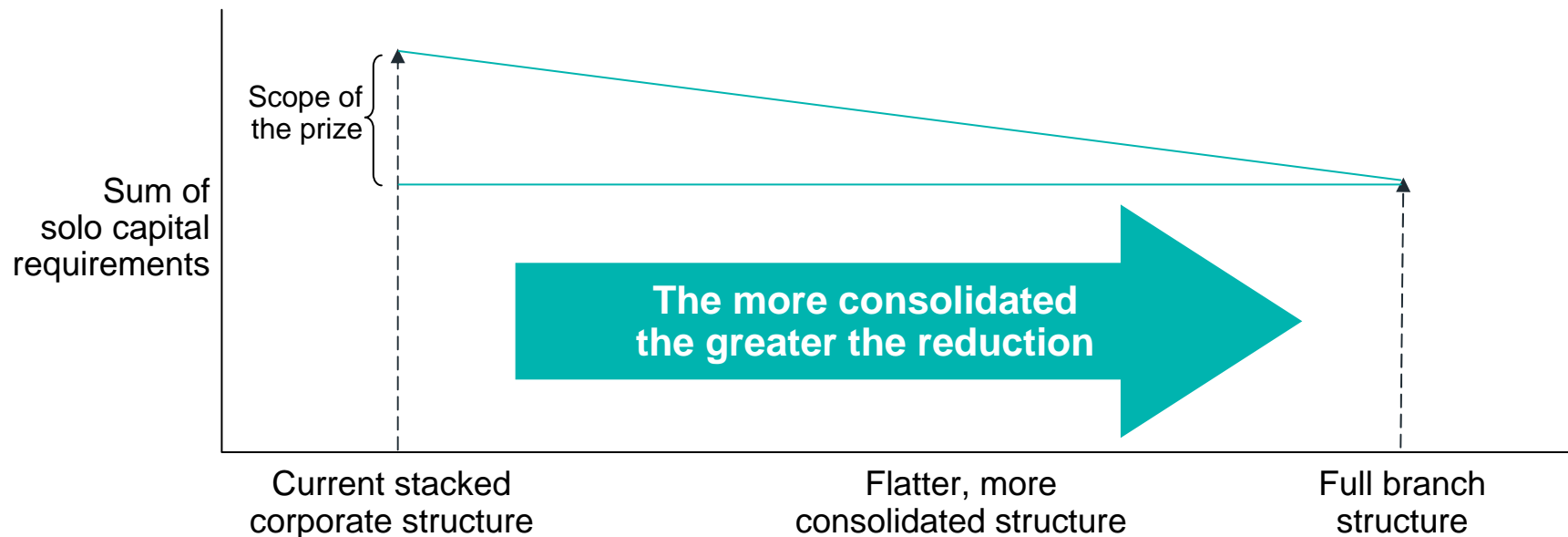
### Risk Management “Lines of Defence”



Precise roles of each line are evolving

4

## Models may need to be flexible enough to help groups understand the merits of different structures



But in practice other considerations may mitigate against full consolidation

Alignment with regional operating structure, costs and tax



4

## Models may also need to help inform on changes in NB design, pricing and strategy

- **Macro effects**

- Reflecting SII in pricing
- Move away from expensive guarantees
- VIF tiering
- Premium boundaries?
- Tax

- **Product effects**

- Annuity ↓
- Unit linked →
- Protection ?
- With-profits ↓
- Variable annuities ?

## 5

## The extent of the new reporting and disclosure requirements will be a challenge ...

CONTENTS	SCFR	RTS	CONTENTS	SCFR	RTS
<b>Executive Summary</b>	✓	✓	C.4 Liquidity risk	✓	✓
<b>Business and Performance</b>			C.5 ALM risk	✓	✓
A.1 Business and external environment	✓	✓	C.6 Operational risk	✓	✓
A.1.A Objectives and strategies		✓	C.7 Other material risks	✓	✓
A.2 Performance from underwriting activities	✓	✓	C.8 The nature of material risk exposures	✓	✓
A.3 Performance from investment activities	✓	✓	C.9 The nature of material risk concentrations	✓	✓
A.4 Operating / other expenses	✓	✓	C.10 Risk mitigation practices	✓	✓
A.5 Any other disclosures	✓	✓	C.11 Risk sensitivities	✓	✓
<b>System of Governance</b>			C.12 Any other disclosures	✓	✓
B.1 General governance arrangements	✓	✓	<b>Regulatory Balance Sheet</b>		
B.2 Fit and proper	✓	✓	D.1 Assets	✓	✓
B.3 Risk management system	✓	✓	D.2 Technical provisions	✓	✓
B.4 ORSA	✓	✓	D.3 Other liabilities	✓	✓
B.5 Internal control	✓	✓	D.4 Any other disclosures	✓	✓
B.6 Internal audit function	✓	✓	<b>Capital Management</b>		
B.7 Actuarial function	✓	✓	E.1 Own funds	✓	✓
B.8 Outsourcing	✓	✓	E.2 MCR and SCR	✓	✓
B.9 Any other disclosures	✓	✓	E.3 Option used for calculation of SCR	✓	✓
B.10 Reporting at group level	✓		E.4 Difference between standard formula and internal model	✓	✓
<b>Risk Management</b>			E.5 Non-compliance with MCR and significant non-compliance with SCR	✓	✓
C.1 Underwriting risk	✓	✓	E.6 Any other disclosures	✓	✓
C.2 Market risk	✓	✓	<b>Disclosures for Undertakings with an Approved Internal Model</b>	✓	✓
C.3 Credit risk	✓	✓	<b>Annex - Quantitative reporting templates</b>	✓	✓

... getting analysts, rating agencies and the financial media to use and understand them could be an even bigger challenge

5

## Producing numbers within the required timeframes will be challenging ...

Solo reporting	Initial deadline	Ultimate deadlines
Report to Supervisors	20 weeks after 1 Jan 2013 <sup>1</sup>	14 weeks from 1 Jan 2016 onwards <sup>1</sup>
Solvency and Financial Condition Report	20 weeks after 1 Jan 2013 <sup>1</sup>	14 weeks from 1 Jan 2016 onwards <sup>1</sup>
Quarterly quantitative templates	8 weeks after quarter end in 2013	6 weeks after quarter end from 2015 onwards

<sup>1</sup> Extra 4 weeks for group reports

**... and require industrialised processes**

---

# Concluding remarks

---

- Key lessons from the past
  - The greater the clarity over what you are seeking to achieve the better
  - Need to balance SII and BAU and retain staff
- Future challenges
  - Managing uncertainty
  - Budget pressure and increasing costs
  - Engaging the Board and meeting the use test
  - Assessing the impact of different corporate structures and new business strategies
  - Meeting and explaining reporting requirements

---

# Questions or comments?

---

