



Agenda

1. Context /Background
2. HSBC IMAP approach
3. Validation approach
4. Independent validation
5. Using Group Internal Audit
6. FSA interaction and feedback
7. What is the industry doing?
8. Challenges and lessons learnt
9. Next steps

1. Context / Background

Scope of Partial Internal Model

- HSBC Life (UK) is a fairly simple medium sized UK insurance company:
 - Established in 1988
 - All business sold in the UK, no legacy business
 - All life protection and unit linked business
 - No with profits business or significant financial guarantees
 - Annuities fully reinsured

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1. Context / Background

Scope of Partial Internal Model

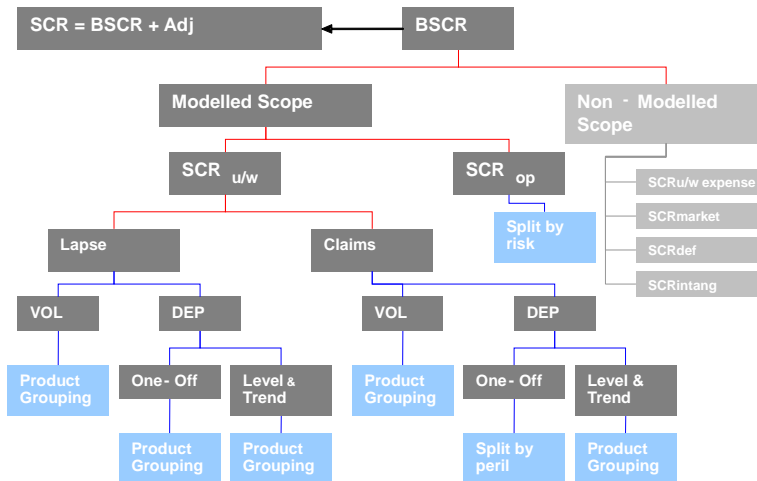
- HSBC Life (UK) is applying to use a partial internal model ('PIM'):
 - Business within scope: All business within HSBC Life (UK); not a Group application however (other EU HSBC entities using standard formula)
 - Risks within scope:
 - Underwriting risk (lapse risk, mortality risk, morbidity risk)
 - Operational risk
 - Market risk modelled using standard formula (due to standard risk profile and lack of guarantees)
 - Counterparty default risk, intangible asset risk modelled using standard formula (due to materiality)

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1. Context / Background Scope of Partial Internal Model

HSBC Life (UK) model structure:



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1. Context / Background Roles and responsibilities

- HSBC Life (UK) had a Solvency II project which started in earnest in 2011 and then transitioned into BAU in June 2012
- Over the project phase there were a number of work streams which at a high level mapped to Modelling, Risk & Governance, and Reporting & Disclosure

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1. Context / Background

Roles and responsibilities

- Nirav was technical lead of the Modelling work stream:
 - Completed the initial and updated Self Assessment Template submissions
 - Defined the scope and extent of the partial internal model
 - Key architect of the model governance and validation framework
 - Key lead in the design of the internal model
- Validation:
 - Coordinated by the Chief Actuary
 - Assessment of compliance with the Solvency II requirements carried out by KPMG ('governance' aspects delegated to HSBC Group Internal Audit)

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1. Context / Background

Roles and responsibilities

- KPMG
 - Engaged by HSBC following Julian Adams speech
 - Review the documents making up HSBC's internal model submission (including validation documents produced by HSBC project team and HSBC Internal Audit team ('GIA'))
 - Issue assurance report on the Partial Internal Model that the documentation meets the relevant Solvency II requirements

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2. HSBC IMAP approach Submission documentation

- Developed set of Partial Internal Model Policies setting out the governance standards to be followed for the development, operation and validation of the internal model, in line with the Solvency II requirements and Group requirements
- Produce corresponding Partial Internal Model Reports evidencing compliance with the Policies
- Going forward:
 - ‘MI’ PIM Reports to be produced quarterly
 - ‘Compliance’ PIM Reports to be produced annually

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2. HSBC IMAP approach Submission documentation

PIM Policies	Reports
• Governance Policy	• Model Governance Report
• Model Change Policy	• Change Report ('MI' Report)
• Limitations Policy	• Limitations Report
• Systems Policy	• Systems Report
• Statistical Quality and Calibration Policy	• Statistical Quality and Calibration Report
• Expert Judgement Policy	• Expert Judgement Report
• Profit & Loss Attribution Policy	• Profit & Loss Attribution Report ('MI' Report)
• Documentation Policy	• Documentation Report, PIM Risk Modelling Report, Balance Sheet Technical Specification
• Validation Policy	• Output Validation Report, Validation Status Report ('MI' Reports)
• Use Test Policy	• Use Test Report
• Data Quality Policy	• Data Quality Report
• [Results Report]	• Capital Valuation Report ('MI' Report)

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3. Validation approach

HSBC validation approach for the submission

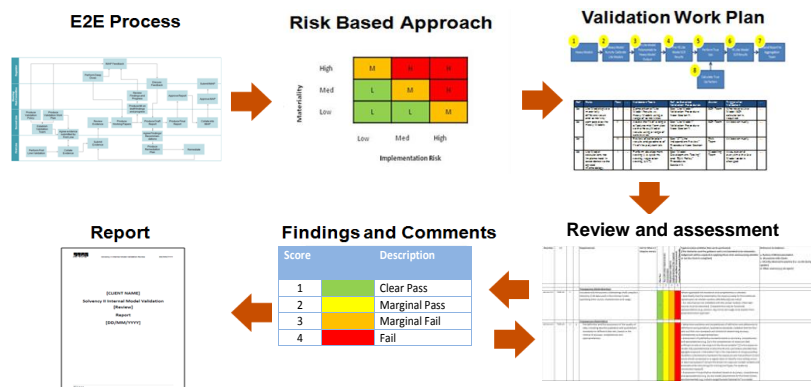
- “Validation” of internal model as defined by TSIMs 18 and 19 can be split into two parts:
 - Application of the validation tools as per TSIM19 (back-testing, sensitivity testing, stability testing, stress and scenario analysis, reverse stress testing, P&L attribution, benchmarking, peer review, simplified models, analysis of change, hypothetical portfolio, manual tracking) – performed by HSBC
 - Compliance with the relevant Solvency II requirements (Articles 101, 102, 112, 113, 120 to 123, 125, 126) – performed by KPMG
- Technical Provisions: validation to be addressed as part of FSA two-stage approach to review of technical provisions
- Standard Formula components of SCR (market risk, counterparty default risk) : full validation in 2013
- ORSA model: to be validated as part of full ORSA Process in 2013

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3. Validation approach

KPMG review approach



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3. Validation approach KPMG document review process

1. Read draft documents
 2. Discuss documents with HSBC
 3. Compare approach used with Solvency II requirements
 4. Inform HSBC of documentation / methodology gaps
 5. Read final documents and produce assurance report
- Two types of comments were given:
 - Drafting
 - Technical

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3. Validation approach Compliance with the SII requirements

Traffic light	Rating guide
	Pass Documents meet SII requirements in this area.
	Conditional pass Documents substantially meet SII documents in this area but some improvements are desirable.
	Fail Documents do not meet SII requirements in this area and significant improvements are desirable.

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3. Validation approach

Assurance opinion

- KPMG final deliverable is an assurance opinion
 - Documents comply with the Solvency Rules and Guidance
- Two types of assurance opinions
 - Positive assurance
 - Negative assurance

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4. Independent Validation

FSA feedback

- Existence of a properly independent validation process was a significant item of feedback from our December pre-application meeting on governance and validation
- Insufficient resource and not proportionate to have a large separate independent validation team

4. Independent validation

What do the regulations say?

Article 203 IM1 (h)

“a report describing the last independent validation of the internal model and its results in accordance with Article 124 of Directive 2009/138/EC.”

Article 229 TSIM 18

“The validation process shall be independent from the development and operation of the internal model.”

4. Independent validation

External validation

- Easier to demonstrate independence using external parties
- Though not necessary to meet independent validation
- Common that small companies do not have the resource to do their own validation
 - Outsource 2nd and 3rd line functions
- Other companies perspective

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4. Independent validation

How did HSBC demonstrate independence?

- Discussions between HSBC and KPMG prompted refinement to the validation process
- 2nd line designed the validation plan
 - performed a number of tests themselves; and
 - commissioned 1st line to perform some the other tests
- 2nd line retains overall responsibility of validation and oversight of the validation activities

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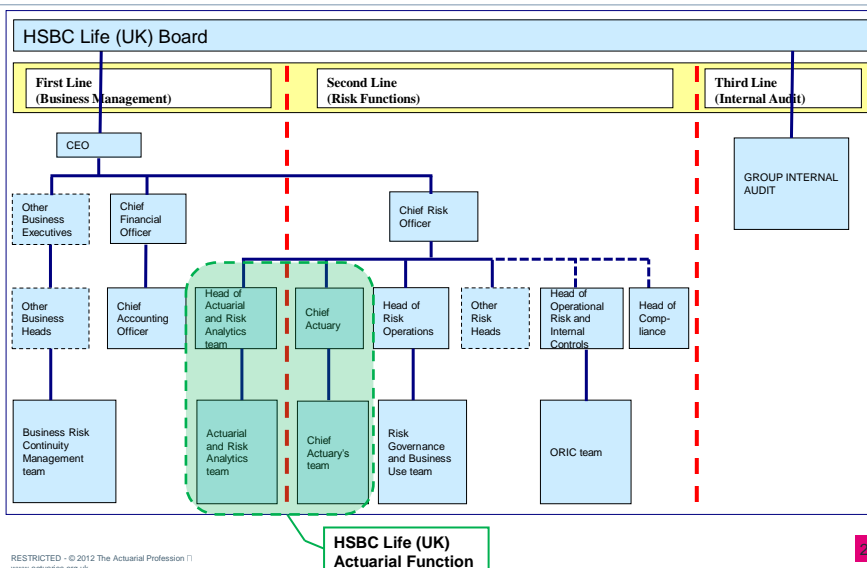
4. Independent Validation HSBC BAU model governance structure

- Actuarial Function sits under Risk Management Function (as functional structure needs to fit with the Bank model)
- Actuarial Function split into:
 - Actuarial and Risk Analytics team – ‘First line’
 - Chief Actuary’s Office – ‘Second line’
- Chief Actuary coordinates all validation and develops validation plans
 - Delegates some validation activities to first line ARA using independent resources
 - CAO carries out additional independent second line validation testing and peer review of first line validation activities
- Additional ad hoc external review from Group Internal Audit, Insurance Head Office and External Audit as appropriate
- Have run validation in BAU for Q3 2012 and set up for Q4 2012

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4. Independent Validation HSBC BAU model governance structure



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5. Using Group Internal Audit

Working with Group Internal Audit

- **Advantages**
 - Internal Audit is a key function and the third line in HSBC's governance framework, so keen to get them involved early
 - Sharing the validation
 - More natural to look at governance aspects of validation
- **Disadvantages**
 - Lack of specialist actuarial or risk resources at their disposal, therefore had to be up-skilled by the project team
 - Many of the early questions / issues raised were immaterial as a result
 - There was significant duplication due to difficulty in defining scope of KPMG vs GIA
- **Role of internal audit in validation going forward**
 - Focus on operational effectiveness of controls
 - System of governance, risk management system, internal control system, ORSA, model governance framework

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6. FSA interaction and feedback

- Constructive interaction and relationship with the FSA in general
- Detailed feedback provided by FSA IMAP team after each pre-application meeting
 - ‘Negative feedback’ only approach: highlighting key issues
 - Operational risk: developments identified warranted another risk assessment process, hence requiring delayed submission of this element of the application: FSA accepting of this and accommodated
- Good access to the FSA – have been and continue to be very helpful whenever we have had questions

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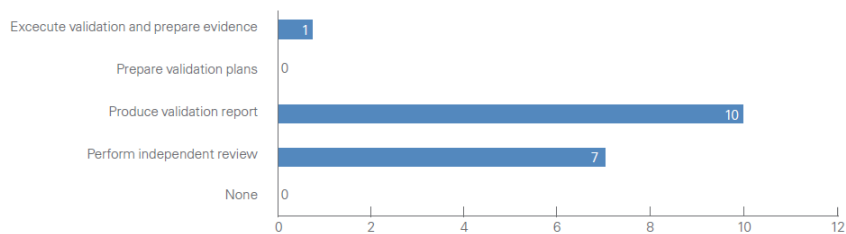
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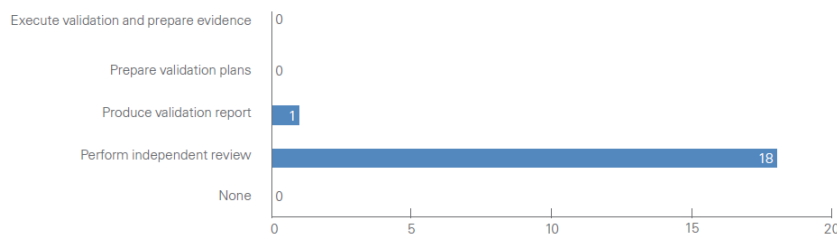
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7. What is the industry doing? KPMG 2012 Technical Practice Survey

Graph 9.27: What is the role of the second line of defence in Internal Model validation?



Graph 9.28: What is the role of the third line of defence in Internal Model validation?



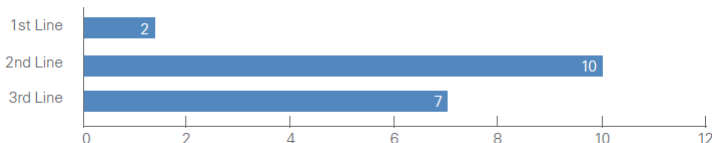
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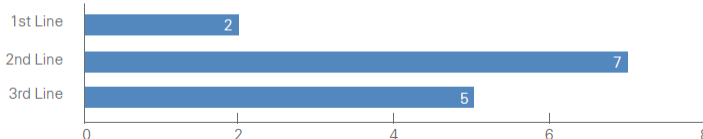
7. What is the industry doing?

KPMG 2012 Technical Practice Survey

Graph 9.29: Which lines of defence use external providers?



Graph 9.30: Which lines of defence will continue to use external providers post-Internal Model approval process submission?



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7. What is the market doing?

Using benchmarking in the validation process

- Why use benchmarking?
 - Easy and cheap to do
 - Comparison against the pack
- But not easy to get industry information to compare
- Using benchmarking in the validation process
 - Variety of approach now, in particular for market risk
 - More difficult to have a peer group to compare with
 - However, for insurance risk – still useful
- Should be used as a trigger for further investigations
- Benchmarking is only one of many validation tools available

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8. Challenges and lessons learnt

HSBC perspective:

- Validation was originally KPMG & GIA following FSA 'independent validation' announcement for Tier 2 companies; then evolved and HSBC responsible – KPMG work is assurance over HSBC's validation
- Scope of GIA work to focus on effectiveness of control system
- Internal Model Policies and Reports - significant duplication with 'new' SAT. Going forward:
 - PIM Policies to be much more tightly aligned to Solvency II requirements
 - Maintain compliance spread-sheet rather than producing multiple 'compliance' PIM Reports:

Solvency II requirement	Additional HSBC guidance	Justification for compliance with requirement	Link to supporting evidence documentation

- Only produce useful 'MI' Reports and maintain documentation of model

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8. Challenges and lessons learnt

KPMG perspective:

- Rating of documents
- Resource constraints
- Access to SMEs is very important

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9. Next steps

- Action plan / development plan
- Streamlining our internal model process and documentation: simplifying PIM Policies and Reports
- Interaction with the FSA over the review period
- External review of technical provisions
- Increased focus on Pillar 3
- Investigate capital efficiency opportunities
- Taking lessons learned on model governance globally across the HSBC group
- Managing moving Solvency II requirements and implementation date

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Questions or comments?

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