# The Team

<table>
<thead>
<tr>
<th>Name</th>
<th>Firm</th>
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<tbody>
<tr>
<td>Frank Chacko/Stephen O’Dwyer</td>
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<td>Greg Shepherd Philippa Stansbury</td>
<td>Markel International</td>
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<td>Milliman</td>
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<td>PwC</td>
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<td>John Bielski</td>
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The objective of the P&L attribution work stream is to:

1. Identify the key features of the various methods used by Solvency II internal model firms to meet the Solvency II P&L attribution requirements;
2. Identify the particular challenges companies have faced and how they have addressed them (or intend to); and
3. Identify and disseminate examples of good practice/lessons learned.
P&LA working group: Approach

• Analysis of feedback from the PRA on the first wave of IMAP firms on the topic of P&LA; and

• Confidential interviews/Discussions with firms (bilateral or as part of the working group) covering:
  – Where they are with P&LA and how they want to develop it; and
  – The practical challenges of developing and implementing the process.
What is P&L attribution?

• Article 123 of Level 1 Solvency II Directive
  – The requirement for internal model firms to “...review, at least annually, the causes and sources of profits and losses for each major business unit” and “...demonstrate how the categorisation of risk chosen in the internal model explains the causes and sources of profits and losses”.

• Article 240 of the Solvency II Delegated Acts provides some detail on the principles of the process:
  – The specification of profit and loss shall be consistent with the increase and decrease of the monetary amount underlying the pdf referred to in Article 228(1). 3.
  – The categorisation of risks chosen in the internal model shall be adequate, and sufficiently granular, for the purpose of risk-management and decision-making in accordance with Article 120 of Directive 2009/138/EC.
  – The categorisation of risk shall distinguish between risks covered by the internal model and risks not covered by the internal model.
  – The attribution of profit and loss shall be made in an objective and transparent manner and be consistent over time.
Regulatory expectations

• The P&LA requirements are articulated at a relatively high level (Art 123 of the level text and Art 240 of the Delegated Acts).

• Whilst the principles are clear there is little in terms of how the process should be carried out.

• Guideline 31 of the EIOPA guidelines on the use of Internal Models covers profit and loss attribution focuses on the definition of profits and losses.

• The PRA has not provided additional guidance around the P&LA process in terms of how it expects P&LA to be undertaken; Except that the P&LA processes should be rigorous and the outputs used in a number of other processes.
PRA expectations: Uses of P&LA

1. As input into the process for ensuring clear feedback loops exist between underwriting, claims and reserving:

   “Ensure clear feedback loops exist between underwriting, claims and reserving. For example, regular monitoring and reporting of actual compared to expected and clear key performance or risk indicators that flag the need for more detailed assessment and allow boards to take appropriate and timely action if required. For internal model firms we also expect profit and loss attribution under Solvency II to be a valuable tool in providing information for, and supporting, the feedback loops.”

   (Dear CEO Letter, Continued soft market conditions in the UK general insurance sector, Chris Moulder Director of General Insurance Supervision, 4 December 2015)

2. For providing evidence of how surplus has arisen in relation to the Matching Adjustment portfolio:

   “In their [MA] applications, firms will be required to describe the process by which they will maintain the MA portfolio on an ongoing basis. The PRA expects the governance process around any extraction of surplus to be robust, and to include:
   
   • An assessment of the firm’s ability to continue to meet the MA requirements post-extraction;
   • A rigorous profit and loss (P&L) attribution for the MA portfolio that clearly shows how the surplus has arisen (i.e. that it has arisen due to a change in either the expected asset or liability cash-flows); and
   • Clear threshold(s) for assessing whether a change in cash-flows is ‘material’.”

   (Solvency II: Matching Adjustment Letter section on the extraction of surplus in relation to applications for Matching Adjustment, Paul Fisher Executive Director, Insurance Supervision, 15 October 2014).
P&L attribution the theory

Use of Profit and Loss attribution

- ORSA
- Internal Model Validation
- Management Information

Risk Register (identification and categorisation of risks)

Categorisation of risk in the internal model

- Business plan / projected distribution of profits and losses
- Profit and Loss attribution analysis (causes and sources of profits and losses)
- Actual profits and losses
## Sources and causes of profits and losses

<table>
<thead>
<tr>
<th>Examples of Possible Sources of Profits and Losses</th>
<th>Examples of Possible Causes of Profits and Losses</th>
<th>Model related explanations for variance between Actual and (model) Expected Profits/Losses</th>
</tr>
</thead>
</table>
| Underwriting divisions or lines of business (Underwriting/Pricing) | • Cat Risk: earthquake and /or Tsunami  
• Underwriting risk (improved rates)  
• Tightening of underwriting/ Pricing controls | • Model error  
• Parameter error  
• Assumption variability  
• Risks not captured |
| Investment over or under performance (Finance/Treasury) | • Market risk (500 point strengthening in FTSE 100) | |
| Commission costs and admin expenses (Finance) | • Reinsurance profit commission | |
| Reserve deterioration or improvement (Reserving + Claims) | • Reserve Risk (UK courts abandon periodic payment settlements)  
• Reserve Risk (Active claims management) | |
Sources and risk categorisation

Major Business Unit: Example 1

Capital requirements by risk
- Underwriting: 50%
- Reserve: 40%
- Market: 10%

Potential source categorisation
- Underwriting: Motor
- Underwriting: Property
- Underwriting: Casualty
- Underwriting: Health
- Reserve: P+C: Motor
- Reserve: P+C: Property
- Reserve: P+C: Casualty
- Reserve: L+H: Health
- Market

Major Business Unit: Example 2

Capital requirements by risk
- Underwriting: 30%
- Reserve: 10%
- Market: 60%

Potential source categorisation
- Market: Equities
- Market: Government bonds
- Market: Corporate bonds
- Market: Real Estate
- Underwriting: P+C
- Underwriting: L+H: Health
- Reserve
An example of attribution

Example: Source: Underwriting: Motor (simplified!)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>£m</th>
</tr>
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<tbody>
<tr>
<td>Expected result</td>
<td>0</td>
</tr>
<tr>
<td>Rate rises beyond expectation</td>
<td>2</td>
</tr>
<tr>
<td>Increased frequency (parameter)</td>
<td>-1</td>
</tr>
<tr>
<td>Other model/calc error</td>
<td>0.25</td>
</tr>
<tr>
<td>Actual</td>
<td>1.25</td>
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</table>

Result percentile on original model: 25th

Range of tolerance: £0.3m

Commentary: 2011 saw large rate rises beyond expectation following the cessation of some medium sized writers. This was not foreseeable but deemed to be acceptably treated by the model as departures of key players from motor insurance happen at least 1 in every 10 years. Claims frequency represents a business plus parameter error from change in mix of business which will be updated in the model/business plan henceforth.

Result indicates model deficiency/identified risk? No (once parameter adjusted)

Reviewed by: A. Findirector
# Practical considerations

## Key considerations

| People | • Who is responsible for P&LA (ownership)?  
|        | • Who inputs into the process both in terms of the specification and the doing?  
|        | • Who receives the outputs of the process? |
| Operationalising P&LA | • How are profits and losses defined? How should this work alongside existing GAAP analysis?  
|                      | • What tools are used?  
|                      | • What infrastructure is used?  
|                      | • When should it be performed?  
|                      | • How does the P&LA analysis feed into the validation cycle and model development/Model change processes? |
| Governance | • How is the Executive and Board engaged?  
|            | • How are the results of the P&LA analysis used? |
How are firms doing it?

<table>
<thead>
<tr>
<th>Process</th>
<th>Most firms leveraging existing AoC processes. P&amp;LA encouraging some greater granularity and Pillar 3 deadlines driving faster production.</th>
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<tbody>
<tr>
<td>Granularity</td>
<td>Varies: full alignment to risk driver level for some, higher level for others but with tactical drill-down</td>
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<tr>
<td>Basis</td>
<td>60% using SII change in Own Funds, others used GAAP. Some extended analysis to changes in SCR &amp; RM</td>
</tr>
<tr>
<td>Frequency</td>
<td>Detailed analysis annually with a lighter touch exercise typically quarterly</td>
</tr>
<tr>
<td>Timeline</td>
<td>Timeline – Typically around 20 WD for AoC element</td>
</tr>
<tr>
<td>Resource</td>
<td>Significant reliance on SMEs, not viewed as sustainable.</td>
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<tr>
<td>Modelling</td>
<td>Some considering carefully how to optimise analysis steps and associated model run schedule</td>
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How useful is it for IM validation?

• Early days – Limited data makes it difficult to draw conclusions
• Has, to date, provided some positive assurance around calibrations
• Use as a prompt for further investigation rather than an automatic change trigger
• Used to consider:
  – Reasonableness of risk calibrations and associated loss functions
  – Identification of new risks
  – Review of known risks not modelled
What are the key challenges?

- Analysis volume & timescales – Getting over the line but often with a significant commitment which is unsustainable in the longer term
- Immaturity of SII reporting process:
  - Setting reasonable thresholds for untraced – tension between forcing a low level understanding of risks vs delivery of what is still not generally an industrialised process
  - Verification of “other explained” category time consuming
  - Level of detail to report
- Data – Availability and granularity
- Consistency – Tension between streamlining and need to preserve key features of different businesses.
What have we learned?

Ownership and involvement of key functions

P&LA requires involvement from Actuarial, Finance, Risk and Business Planning etc. The most well developed firms usually had a “super-user” at a senior level to facilitate a joined up process and use of outputs.

Resourcing

Existing analysis of change processes or result analyses capture many elements of the P&LA process. Most firms have been running P&LA as an (under resourced) separate process given the link to the model. This is unlikely to be optimal or sustainable.

Operational risk

Op Risk variance generally more difficult to interpret and more contentious in terms of its usefulness relative to other risk categories.
What have we learned?

Use

- P&LA process is at an early stage of development and application
- Some feeling that, as yet, there has been little incremental value
- Some were more positive and a range of uses were noted:
  - Validating whether all material risks are captured;
  - Providing comfort that risk distributions are not unreasonable;
  - Confirming if known un-modelled risks should remain so
  - Assessing effect of hedging strategies / reinsurance arrangements
The trajectory of P&LA

• Industrialisation of the process and modelling infrastructure

• Address time pressure and the balance between do and analyse

• Look at ways to cascade the knowledge required from SMEs to other staff

• Exploit synergies with other processes e.g. daily solvency monitoring
Any Questions