



The Actuarial Profession

making financial sense of the future

GIRO conference and exhibition 2010
Vivian Tse and David Paul



The Fall and Rise of the Standard Formula

12-15 October 2010

Agenda

- Formulae we have known – history and geography
- EU SII Standard Formula – current state of play
- Striking a balance between practicality and risk sensitivity
- The calibration “story” - QISs 1 to 4
- 2009 – the turning point for Standard Formula?
- Next chapter in the calibration “saga” – hot off the presses
- Where to from here?
- Prizegiving (Welsh-themed) and discussion, Q&A

Who wants to be a formul-aire?

What is the current (pre 2012) formula for a general insurer's capital requirement?

A. 16% of gross premiums less 23% of reinsurance premiums ceded

C. A formula with an inverse relationship to the Chief Actuary's salary

B. 16% of premiums plus 4% of riskier asset classes

D. The greater of 16% of premiums or 23% of claims

Where does 16% x premiums ... come from?

Which of the following statements is true?

A. It derived from Continental Europe in the early post-war years of the European Community

B. It was a common benchmark in the London / Lloyd's market and then entered the Third Non-Life Directive in 1991

C. It was introduced in the Insurance Directives in the early 70's and no-one is very sure how the numbers were derived

D. Someone dreamt it up in the bar at the first ever GIRO event

Risk-sensitive formula around the Globe

Which of the following statements is true?

A. The US Constitution in Article 23(b) prohibits States from setting capital requirements on corporations

B. Bermuda is unwilling to introduce capital requirement via formula because it is focused on a model regime

C. One EU state introduced a new capital requirement formula in 2005, although the SII debate was then in its infancy

D. Solvency II's operational risk factors were dreamt up in the bar in GIRO in Sorrento

Formula around the globe ... formula, formulae, quasi-model

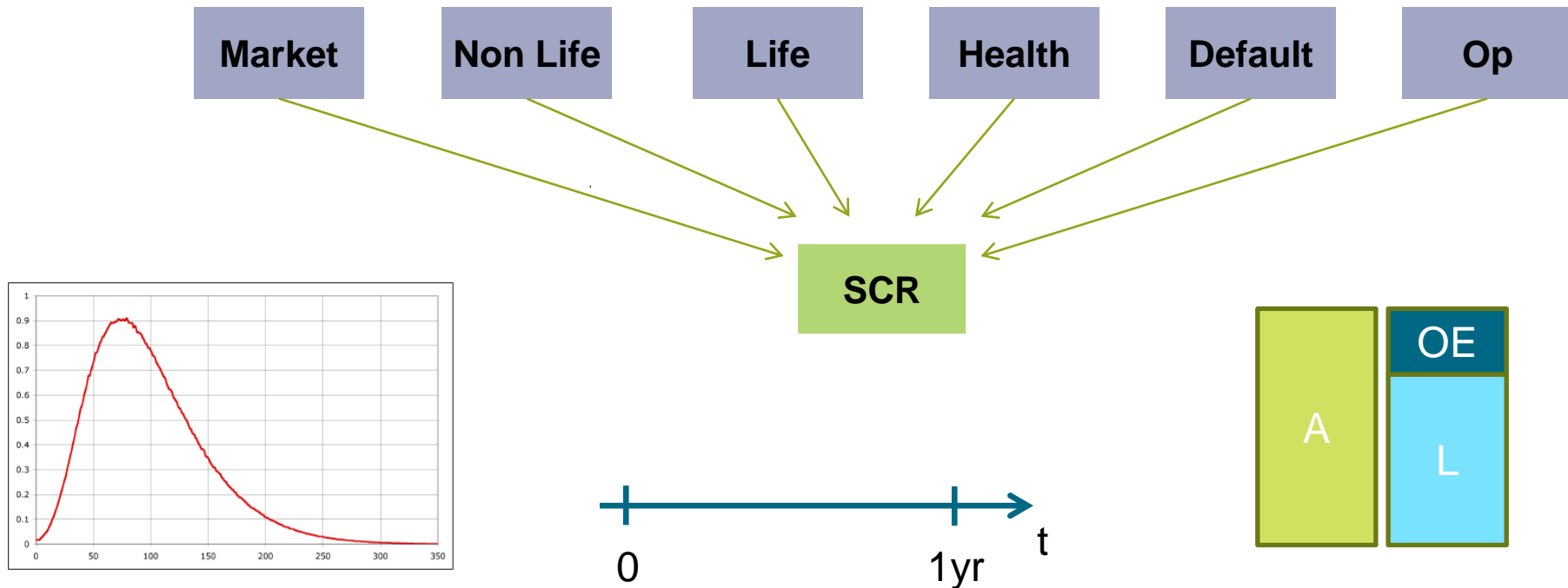
Territory	Complexity
1971 Directive	4 pages
UK ECR	12 pages in INSPRU
Bermudian Solvency Capital Requirement (since 2008)	40 pages
US RBC (NAIC)	Circa 70 pages
APRA	85 pages in GPS 110, 112, 114, 115 and 116
Singapore	73 pages in Insurance (Valuation and Capital) Regulations 2004 plus 20 pages of amendments since
2012 EU Standard Formula	330 pages in Tech Spec, 66 pages in Annexes, 11+ input tabs in main spreadsheet, 10 helper tab spreadsheets

S.F.O.A.P.

the EU Standard Formula “on a page”

Level 1 – Framework Directive

- Prescribes risks to be considered
- Prescribes 99.5% confidence level
- Prescribes one year horizon
- Available capital on fair value basis

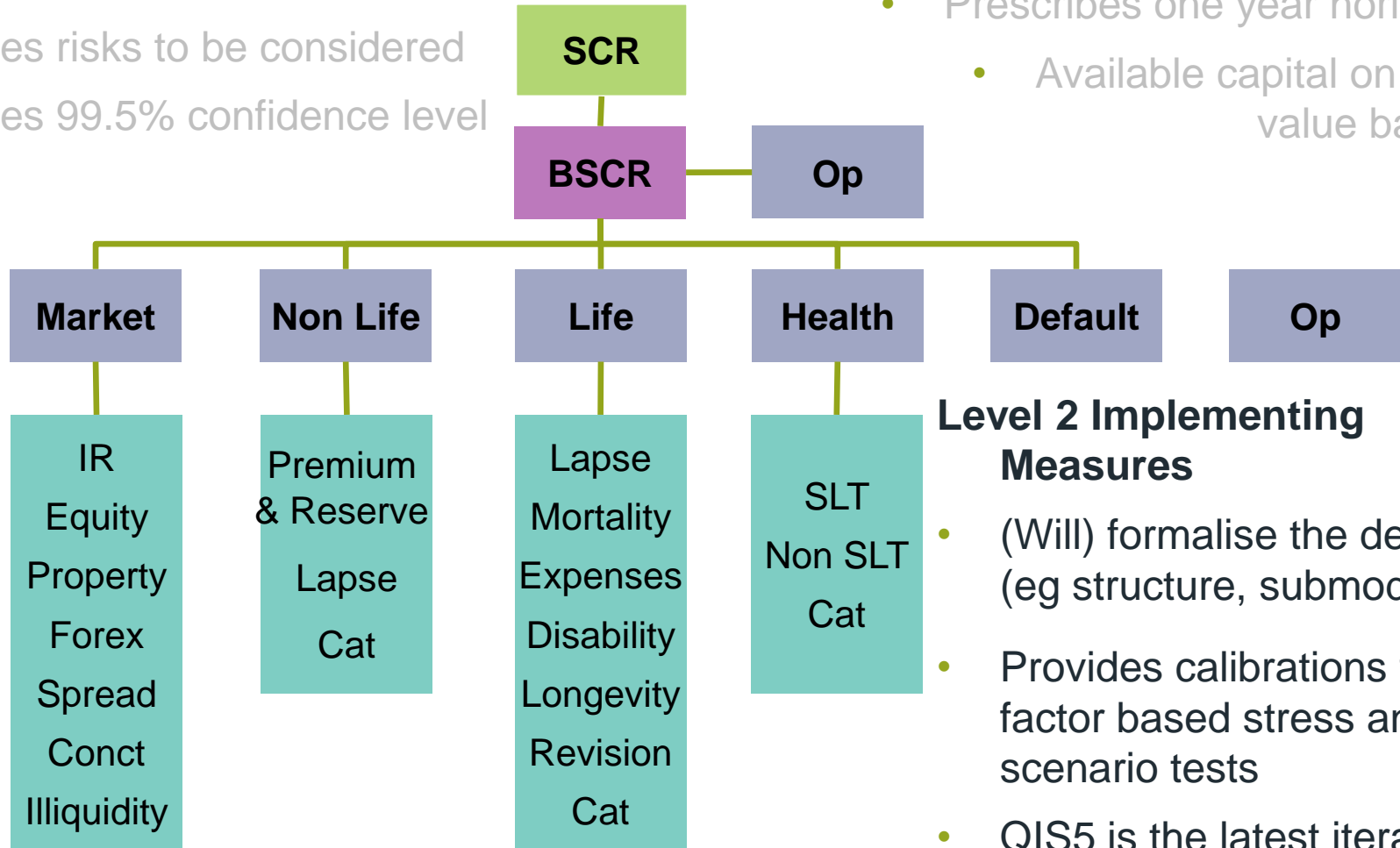


S.F.O.A.P.

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Level 2 Implementing Measures

- (Will) formalise the details (eg structure, submodules)
- Provides calibrations for factor based stress and scenario tests
- QIS5 is the latest iteration

QIS5 in more detail

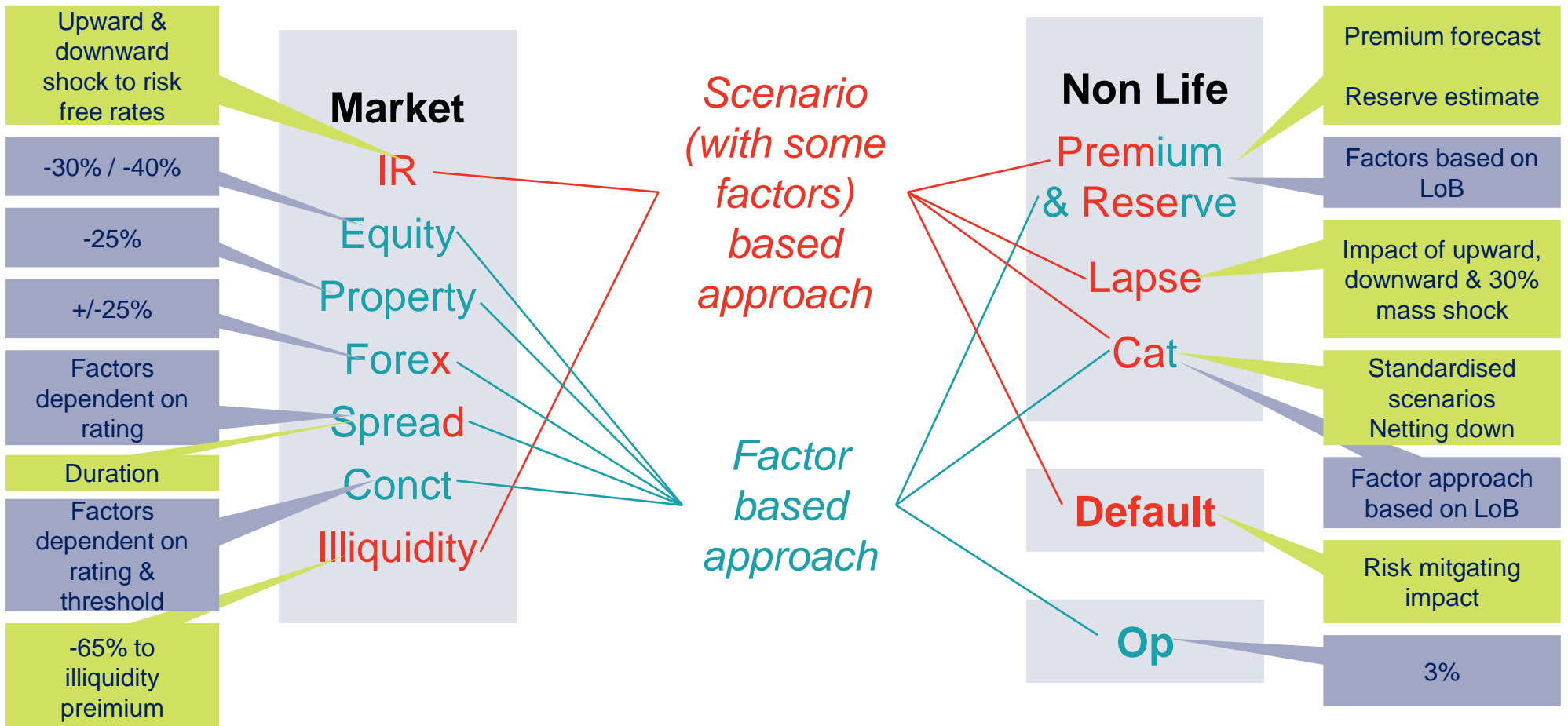
Market
IR
Equity
Property
Forex
Spread
Conct
Illiquidity

Non Life
Premium
& Reserve
Lapse
Cat

Default

Op

QIS5 in more detail



plus Diversification credit (eg geographical, counterparty)
 plus Correlation matrices (eg between LoBs, perils, sub-modules, modules)

Goldilocks

Is the latest Standard Formula model (QIS5)...?

A. Too complex

B. Not sufficiently complex to capture the appropriate risks

C. Just right

D. Fine as long as it reduces capital requirements

QIS5 – Challenges to latest Standard Formula

- One size fits all objective too ambitious?
 - Overly accommodating to level field ideology?
 - Adjustment for scale last seen in QIS2. No adjustment for scale since
 - CP 71 demonstrates the potential range of non-life calibrations due to size
- Overly complex for intended user?
 - Has it gone beyond the capacity / ability of small/medium sized insurers to understand / undertake without excessive external assistance?
- Potential for “gaming” the system?
 - Model relies on a mix of verifiable and non-verifiable data
 - Judgement is required to determine appropriate data in some places
- Inconsistent application of model requirements
 - Judgement is required in modelling some of the scenarios
 - Uncertainty in interpretation

When does a formula stop being a formula?

How many pages was the QIS1 technical specification in 2005?

A. 8 pages

C. Approximately 200 pages

B. 66 pages

D. Approximately 2,000 pages

The pre-history of calibration

- QIS1 – December 2005
 - explored only best estimate and risk margin – ***QIS1 tech spec was 8 pages***
- QIS2 – July 2006 – first sighting of non-life calibration
 - “initial, tentative ...”; “CEIOPS cannot make assertions about the appropriateness of this calibration”
 - Size factors were a part of the Standard Formula
 - Basic structure of sub-modules that we see today
 - TVar still in play
 - LoB volatility factors and correlations between LoBs appeared
 - ***QIS2 tech spec was 66 pages***

The history of calibration – QIS3 & QIS4

- QIS3 – June 2007
 - QIS3 tech spec was **119 pages** plus annexes and calibration papers
 - Additional sub-modules plus refinement of sub-modules and calibrations
- 10 pages explaining non-life calibration
 - Premium risk calibrated from German insurance market data
 - Reserve risk (motor and TPL) from UK data
 - Reserve risk (health) from French data
 - Reserve risk (other) – “assessed judgmentally adjusted downwards”
- QIS4 – July 2008
 - QIS4 tech spec was **286 pages**
 - Geographical diversification methodology
 - Health sub-modules still developing, otherwise mostly refinement of calibrations
 - No further papers on calibration

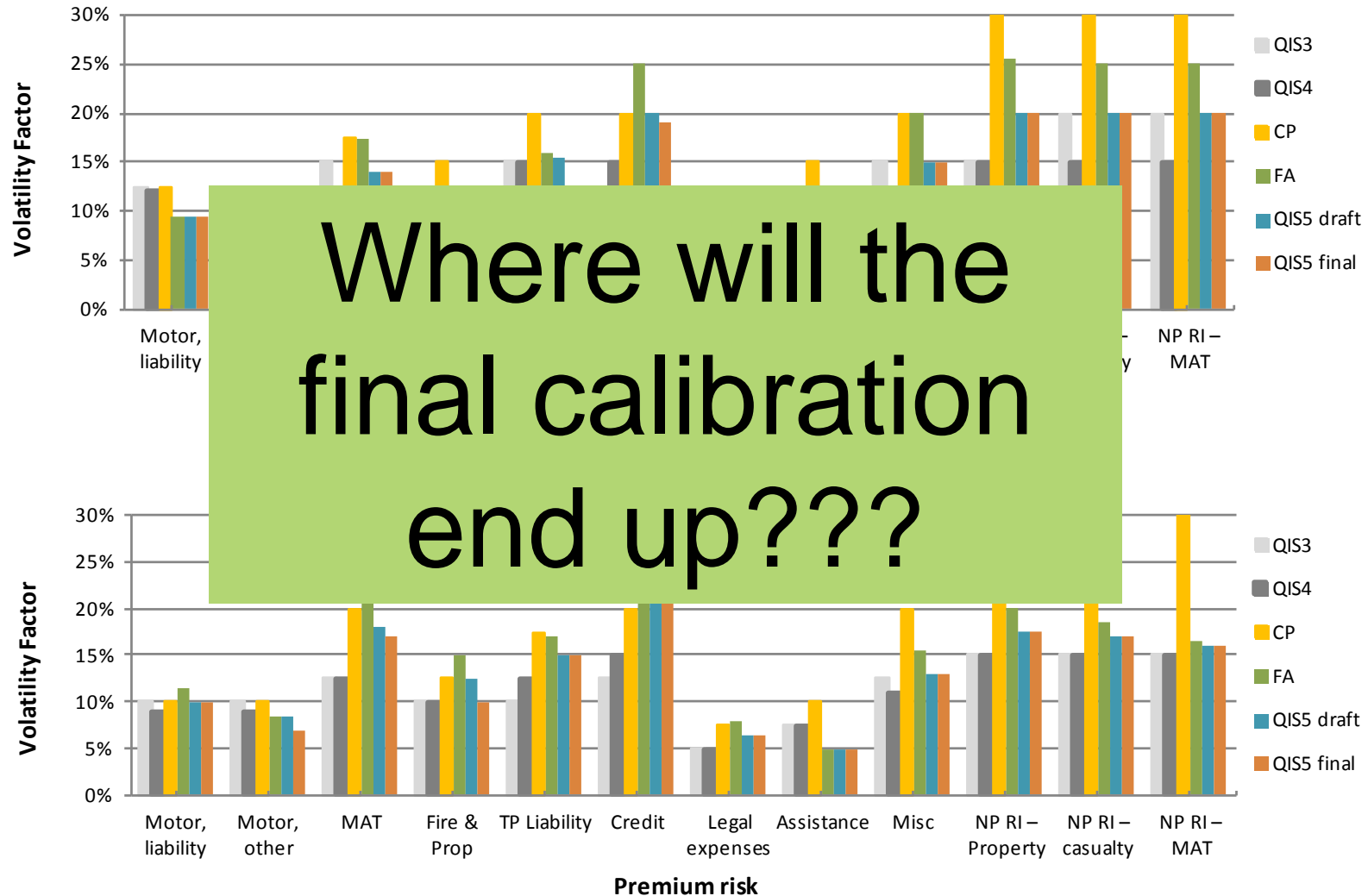
The history of calibration – 2009

- CP48 – July 2009 (second wave)
 - Interpreted Article 111 – but didn't move the debate on
- CP71 – November 2009 (third wave)
 - Laudable attempt at open-ness
 - Net and gross issue coming to the fore
 - Difficulties of a pan-European calibration apparent
 - 'Diversification by volume' – the impossibility of selecting correct factors for different sizes of company – should the calibration be adequate for the smaller companies?
 - Was much attention paid (in the UK?) to the technical issues emerging
- Industry 'up in arms' over CEIOPS's new calibration and the higher numbers produced across nearly all submodules

The history of calibration – the Commission strikes back in 2010

- The first drafts and then the eventual QIS5 technical specification has witnessed the European Commission drawing back from the higher capital requirements proposed by CEIOPS
- Not much statistical justification:
 - *The argument has been made that the final advice from CEIOPS, if adopted unchanged, would result in a significant increase in capital requirements as compared to the last quantitative impact study that was undertaken (QIS4). These concerns have been taken into account when modifying the technical specifications. (from CEIOPS QIS5 cover note)*

Evolution of Non-Life Calibration



Further attempts at calibration: health leads the way

- Significant lobbying direct to Commission lead to re-opening of debate in first half 2010 for health:
 - Health task force set up with Commission, CEIOPS, AMICE, CEA, CRO Forum, Groupe Consultatif.
 - The groupings were re-visited and Commission decided to separate short term medical indemnity from income protection (workers' compensation remaining as third classification)
 - “Our data is better than your data”
 - Gave some homogeneity in the 3 classes – but big national differences in perceived ‘correct’ calibrations
 - Significantly reduced capital for medical indemnity business
- What if this were to be extended to ‘non-life’?

Joint Working Group on non-life calibration

- Press release imminent
- JWG lead by CEIOPS (chair is official from Netherlands central bank) with Commission as observer
 - AMICE, CRO Forum, Groupe Consultatif, CEA
- Aim is to support the Commission when finalising the Level 2 implementing measures – so review to be delivered by end of Q1 2011
 - Specific data requirement with submission date of 30 November 2010
 - Result of analysis (but not the data) will be made public
 - Transparency with what calibration methodologies are applied

Joint Working Group on non-life calibration

- Centralised database with data only accessible to CEIOPS
- Discussions about insurers' ability to deliver up gross and/or net triangles
- Needs to report by mid-March
- Discussing methodologies until December when data arrives
- Doesn't have scope to move away from factors per LoB for premium risk and reserve risk
- Some flexibility taking into account the size of the companies (what does thing mean?)
- Data cleansing features in the discussions
- Recognition of 'selectivity' problem with only large companies providing data to the exercise
- Only two (three) "Brits" on JWG
- How much interest from UK another regulatory overhead

Feedback

Which of the following do you most agree with?

A. I can't wait to get back to the office on Monday and organise our data to contribute to the new calibration exercise

C. I wish I hadn't come to this workshop because we'll be on an internal model anyway

B. I'm not convinced more data and calibration will make Standard Formula any more useful

D. This is so bad I am going to find a beach and just keep walking



Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

