

# Solvency II – QIS4



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# Recap

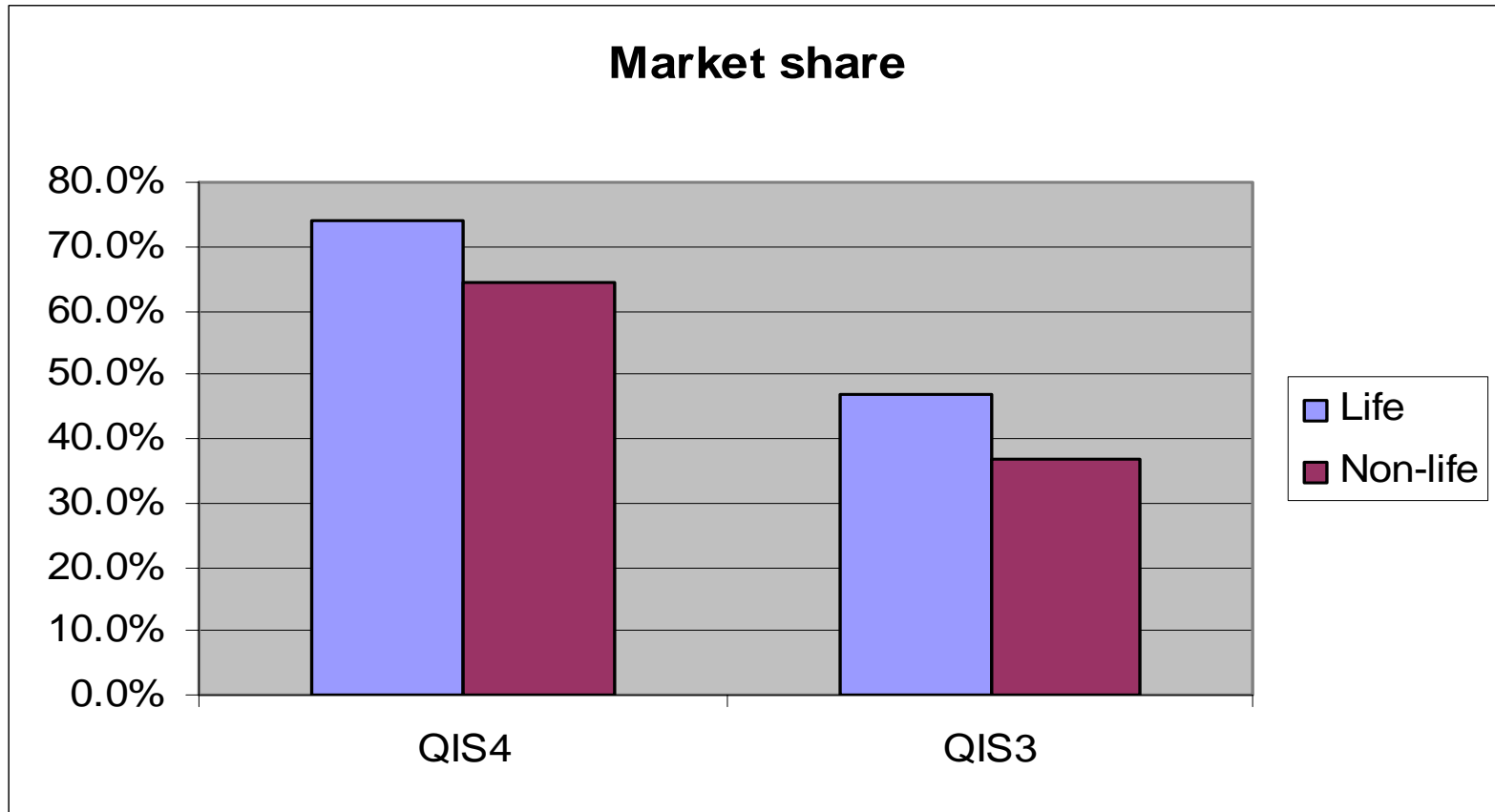
- QIS4 objectives – call for advice
  - Quantitative impact on solvency balance sheets
  - Check that TS aligned with draft Directive
  - Collect data to support analysis of options for level 2 measures
  - Encourage preparation for Solvency II
  
- Particular attention
  - Suitability & practicability of TS especially simplified methods / entity-specific parameters
  - MCR
  - Additional Data on Own Funds
  - Internal models
  - Insurance groups

# Number of respondents

- Total respondents

Category	QIS4	QIS3	Irish growth	European growth
Life	26	18	44.4%	
Non-Life	39	21	85.7%	
<b>Total</b>	<b>65</b>	<b>39</b>	<b>66.7%</b>	<b>37.5%</b>
Pure reinsurers (included above)	13	7	85.7%	

# Total market share



Based on CEIOPS criteria:  
Premium income – Non-Life  
Technical provisions - Life

# Resources – QIS 4

Person Months	Ire Overall	Life	Non-Life	Europe
Completing overall QIS4	1.9	1.5	2.2	3.2
Getting acquainted to the Technical Specifications	0.5	0.4	0.6	1.0
Assessment of best estimate provisions	0.4	0.3	0.4	0.9
Calculation of the risk margin	0.2	0.2	0.2	0.4
Valuation of assets and other non-insurance liabilities	0.2	0.2	0.2	0.5
Calculation of the MCR	0.2	0.1	0.2	0.4
Calculation of the SCR	0.6	0.4	0.8	1.0

In general smaller undertakings indicated it took less time to complete QIS 4 than larger ones

# Resources – Solvency II

Person Months	Overall	Life	Non-Life
One-off development of appropriate systems and controls, of which	12.9	11.7	14.1
Establishment of risk management systems	3.3	4.4	2.4
Staff training	2.8	3.9	1.9
Model development	8.5	13.0	5.1
Establishment of appropriate data collection and IT systems	2.5	1.2	3.3
Any other Solvency II related issues	2.0	2.1	1.9
Yearly valuation of provisions (standard approach)	1.1	1.3	1.0
Yearly valuation of MCR (standard approach)	0.6	0.6	0.6
Yearly valuation of SCR (standard approach)	1.3	1.8	0.9

# Coverage ratios

	Min	25th	Med	75th	Max
Life - Available capital to SCR	127%	224%	279%	346%	869%
Life - Available SI capital to 150%*RMSM		118%	167%	237%	
Non-Life - Available capital to SCR	12%	130%	181%	257%	1031%
Non-Life - Available SI capital to 150%*RMSM		171%	274%	418%	

Change in solvency coverage reflects:

- (1) Change in eligible funds
- (2) Different solvency requirements

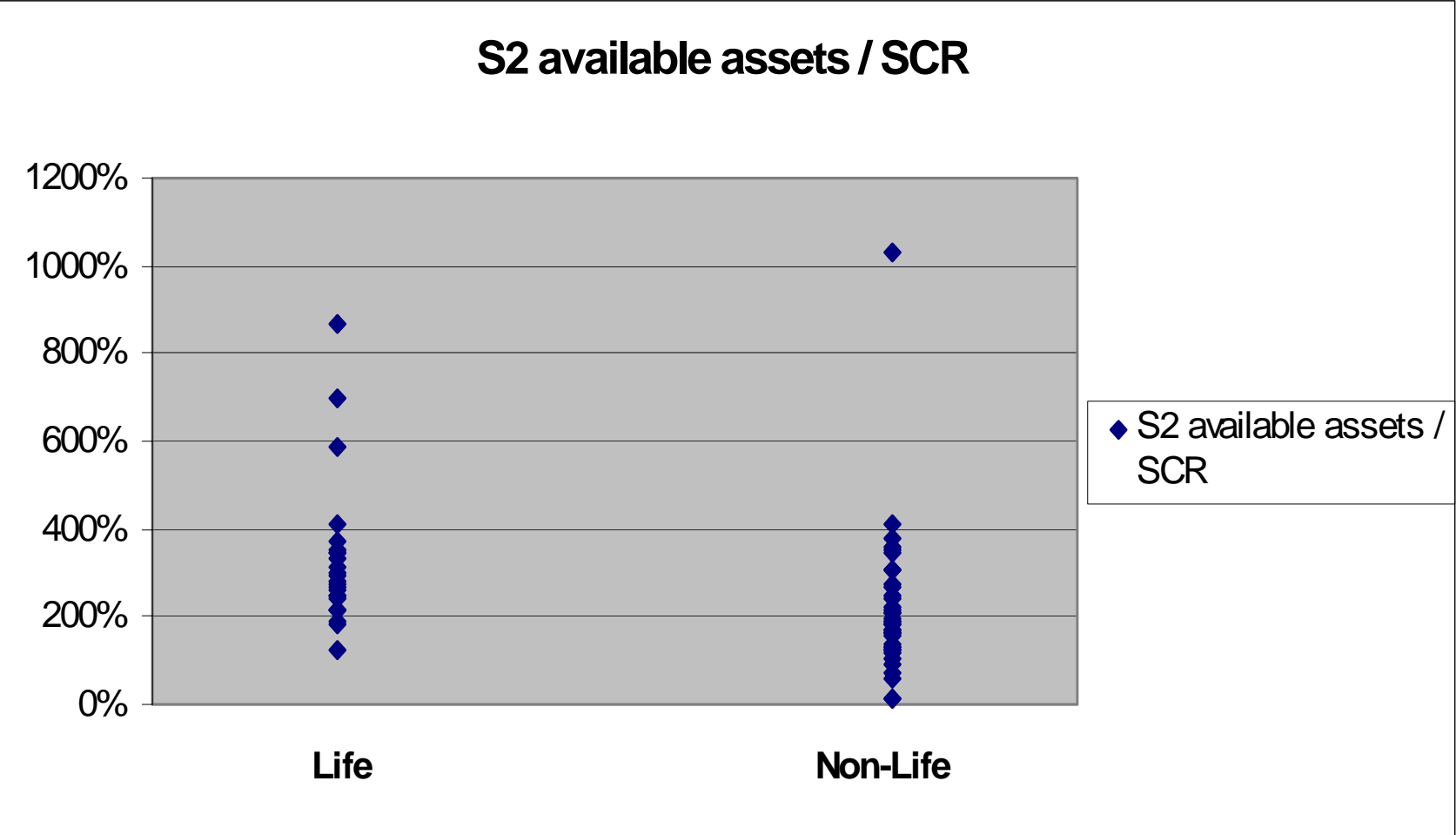
All submissions, including captives, under standard approach

# Coverage Ratios

- 5 companies need to raise capital to meet SCR (7.7% / Eur 10.9%)
- 2 companies need to raise capital to meet MCR (3.0% / Eur 1.2%)
  - all 'small' captives
  - Captives under standard approach, not national guidance on Captives
  - Driven by large CAT – real '1-in-200'?
  - Excluding Captives
    - Coverage ratios of Non-Life
      - *Min = 105% (12%), Median = 211% (181%)*



# SCR coverage



# Eligible Capital

	Min	25th	50th	75th	Max
<b>Non-life</b>					
QIS4 eligible funds to S1 eligible funds	2.3%	103.2%	119.4%	161.4%	362.1%
SCR to S1 RMSM*150%	50.1%	125.9%	215.6%	299.2%	923.6%

	Min	25th	50th	75th	Max
<b>Life</b>					
QIS4 eligible funds to S1 eligible funds	96.2%	201.7%	280.3%	367.4%	1906.3%
SCR to S1 RMSM*150%	47.9%	75.8%	164.2%	260.4%	978.5%

# Surplus capital

	Decrease more than 25%	Decrease more than 50%	Increase more than 25%	Increase more than 50%
Life	0	0	21	21
Non-Life	20	13	10	7
Total	20	13	31	28

- Overall Life companies clearly benefit more than Non-Life

# Assets and Liabilities (other than Technical Provisions)

- Broad support for general design and methodology
- IFRS deemed to be a suitable approximation of the economic valuation – clear need for SII valuation approach and IFRS phase II to develop consistently
- Generally no major practical difficulties in the valuation
- Specific issues:
  - Deferred taxes – major issue
    - unclear treatment
    - clearer framework sought to avoid inconsistency
  - Participations (non-listed assets)
- Biggest movement – reinsurance asset fell vs current BS
  - Non-Life (median) – 85%
  - Life (median) – 60%

# Technical Provisions

- Generally accepted that approach appropriate and practicable – including Cost of Capital Approach
- Criticism that 6% factor overstates the true cost of capital – reference to CRO forum and 2.5% to 4.5%
- Criticism of lack of diversification benefit in the Risk Margin calculation
  - + assumption about receiving company
  - + remove a line of business – insolvency due to removal of diversification
  - - not an economic view from company perspective

# Technical Provisions – Non-Life

- Reduction in Technical Provisions – i.e. Solvency I TP < Solvency II + Risk Margin
- Surplus in UPR, remove explicit margins (booked vs actuarial 'Best Estimate'), discounting and removal of equalisation provisions (credit)
- Discount rates:
  - Some arguments for swap rates – liquidity, less affected by supply and demand

# Technical Provisions – Non-Life

Non-Life	Min	25th	Med	75th	Max
Ratio of QIS4 TP to S1 TP	23.1%	82.7%	88.6%	95.1%	109.5%
CoC RM / QIS4 TP	1.0%	3.9%	5.8%	10.3%	29.7%

# TP's by Line of Business – Non-Life

Line of business	25th	Med	75th
Health	41.1%	83.2%	94.0%
Motor, third party liability	85.5%	88.1%	95.4%
Motor, other classes	79.3%	88.9%	96.0%
Marine, aviation and transport	74.7%	95.8%	104.7%
Fire and other damage to property	83.0%	94.7%	98.6%
Third-party liability	80.1%	90.9%	95.3%
Credit and suretyship	74.7%	83.8%	91.7%
Miscellaneous non-life insurance	56.5%	92.9%	94.6%

Note: All health LOBs combined



# Technical Provisions – Non-Life

- Comments:
  - Issues over subdivision of risk – motor liability and motor other mentioned, treatment of business interruption
  - Miscellaneous class
  - Difficulty in allocating premiums and provisions to different geographical regions
  - Majority used ‘Helper Tab’ for Cost of Capital
  - CoC not appropriate for credit – ability to cancel exposures => no run-off
  - Differences between sound actuarial techniques, proxies and simplifications not always clear-cut - e.g. QIS 4 prescribing stochastic reserving techniques?

# Technical Provisions – Non-Life

- Best Estimate under Solvency II - Group Consultatif working group
  - No standardised definition of a reserving 'best estimate'
  - The "model" does not necessarily have to be simulation based => Art 76 does not preclude deterministic approach
  - Best estimate = prob. weighted ave. of future cash flows
    - Some weight has to be given to high cost low prob. Losses (referred to as 'binary')
    - Change? Companies considering this type of risk in overall capital assessment not Best Estimate?
    - E.g. new type of latent claim, legislation changes, high inflation environ.

# Technical Provisions – Non-Life

- Commonly used reserving methods are listed as ‘acceptable proxies’ – QIS 4 spec.

Acceptable Actuarial methods once the following two conditions are met

- (1) Available company specific data is at least partially used rather than pure application of market data
- (2) Actuarial function is involved to bring knowledge, expertise and ability to make judgements on the appropriateness of the reserving method.

# Own Funds

- Majority deemed proposals sensible
- Comments that 'grandfathering' an important instrument

	Tier 1	Tier 2	Tier 3
QIS4 Own Funds	93.3%	6.6%	0.1%

This represents composition for all submissions – Life & Non-Life

# Own Funds

Composition of Tier 1 Eligible Elements	
Common equity capital	27.6%
Other issued capital instruments	3.5%
Valuation adjustments (assets less liabilities)	31.0%
Other items	37.8%

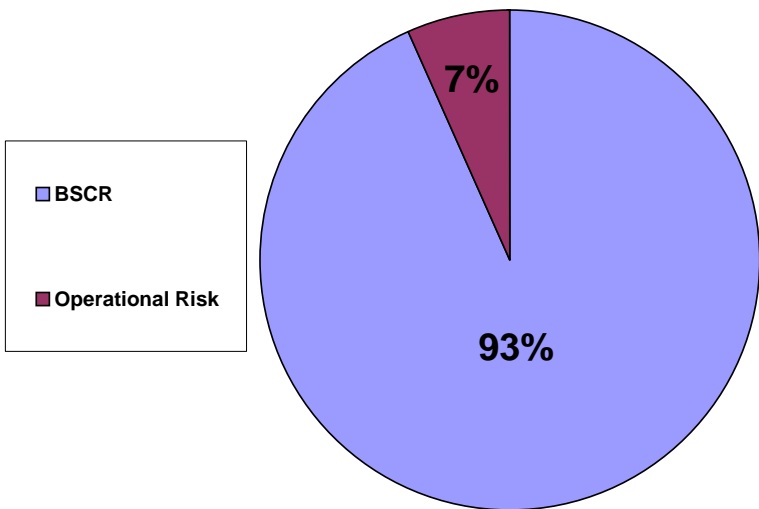
Some caution – some submissions included ‘valuation adjustments’ in ‘common equity capital’.

Again this represents composition for all submissions – Life & Non-Life

# SCR

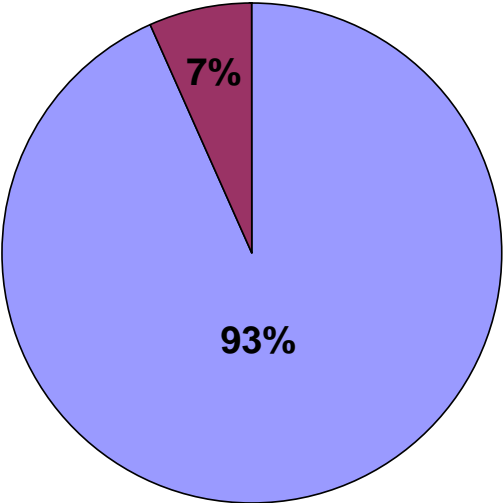
- General consensus that approach is suitable and appropriate
- Still limited comment that 'Free Assets' are subject to Market Risk

# SCR – Non-Life Composition

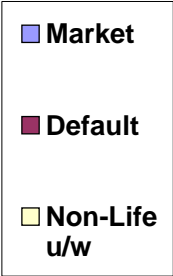
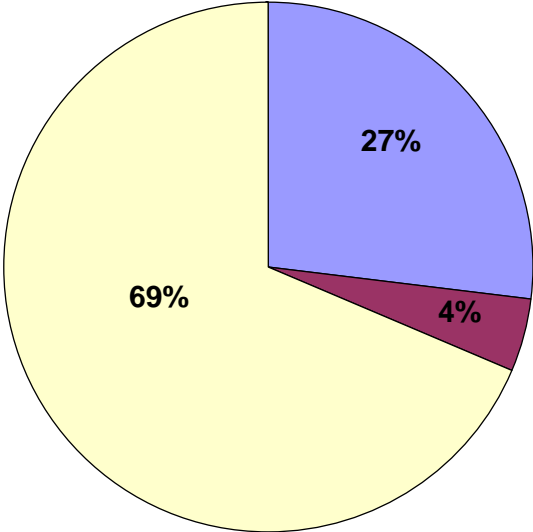
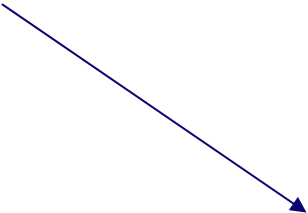


Median Results

# SCR – Non-Life Composition

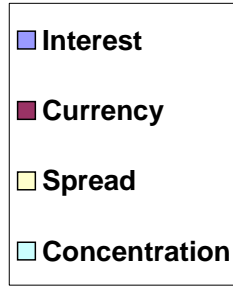
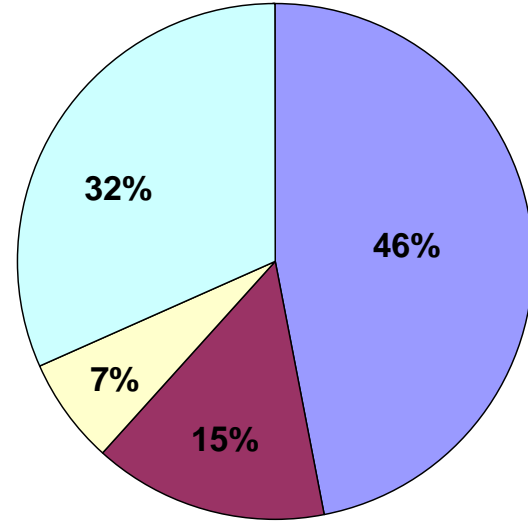
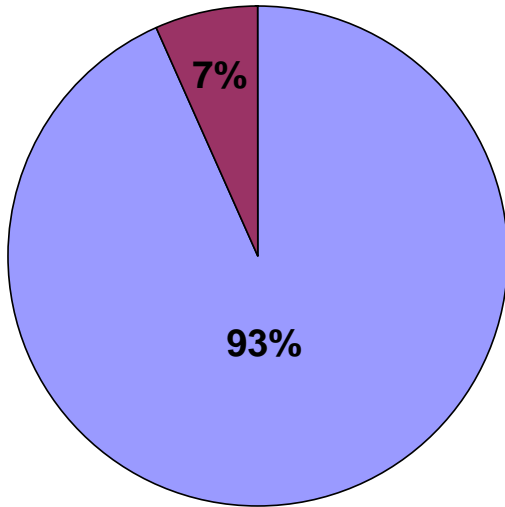


Median Results

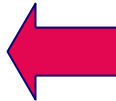
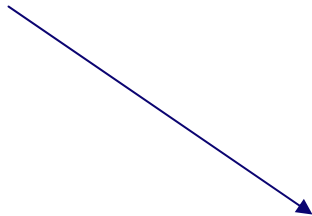
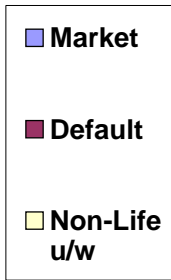
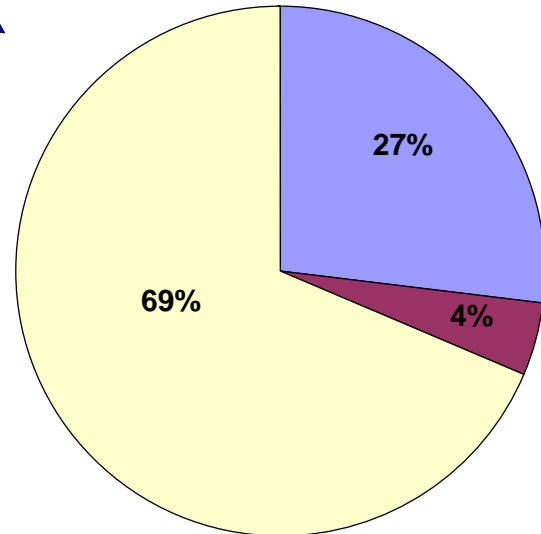
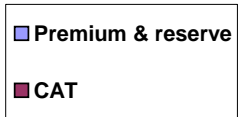
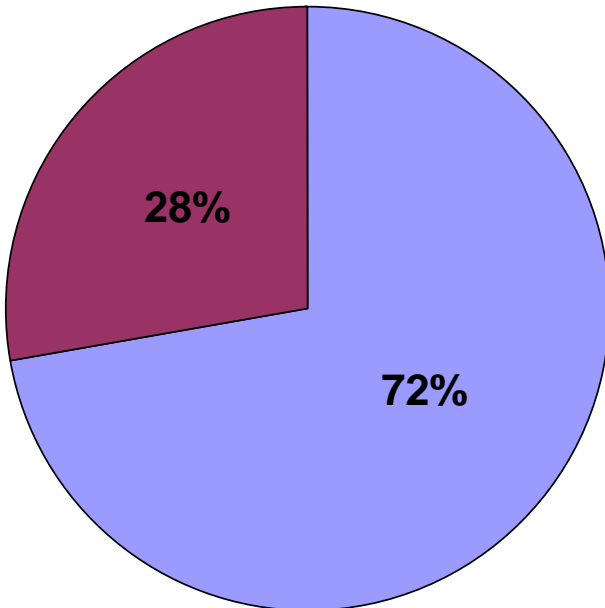




# SCR – Non-Life Composition



## Median Results



# BSCR – Non-Life Composition

Figs - %age of BSCR with no allowance for diversification

BSCR - Non-life composition	Min	25th	Median	75th	Max
Market	0.0%	13.3%	30.0%	41.5%	97.2%
Default	0.0%	1.4%	4.9%	16.6%	81.4%
Health	0.0%	0.0%	0.0%	5.8%	79.5%
Non-Life u/w	0.0%	59.6%	76.1%	89.8%	100.0%

Distribution of results on any line refers to all non-life company submissions

# Non-Life Market Risk composition

Figs - %age of BSCR with no allowance for diversification

Non-life market risk composition	Min	25th	Median	75th	Max
Interest	0.0%	3.6%	7.4%	11.2%	34.6%
Equity	0.0%	0.0%	0.0%	1.8%	38.3%
Property	0.0%	0.0%	0.0%	0.0%	21.4%
Currency	0.0%	0.0%	2.3%	16.7%	64.4%
Spread	0.0%	0.0%	1.0%	5.2%	31.0%
Concentration	0.0%	1.4%	4.9%	16.6%	81.4%

Distribution of results on any line refers to all non-life company submissions

# Non-life underwriting risk

Figs - %age of BSCR with no allowance for diversification

Non-life underwriting risk	Min	25th	Median	75th	Max
Premium & reserve	0.0%	27.1%	55.7%	78.2%	98.3%
CAT	0.0%	9.0%	21.5%	47.4%	98.0%

Distribution of results on any line refers to all non-life company submissions

# SCR – Market Risk

- Comments received:
  - 32% equity too low for 99.5% - 40% more appropriate
  - Suggestion to introduce sensitivity to changes in shape of the yield curve
  - Request for further work on the correlation between equity risk and interest rate risk
  - Dampener approach – (a) premise that market falls likely to be less severe when markets depressed (b) dampener linked to duration of liabilities
    - Universal disapproval of link to duration of liabilities
    - Limited support for principle of dampening

# SCR – Market Risk

- Comments received:
  - Currency risk – additional work required to capture true risk on a ‘look-through’ basis
  - Equity and Interest Rate volatility missing from the formula – important for companies with embedded options in their liabilities
  - Path required for market shocks – link to dynamic hedging strategies
  - Liquidity a missing element?

# SCR – Counterparty Risk

- Comments received:
  - Some comments that welcomed improvements - LGD
  - Criticism that overly complicated and time consuming
    - E.g. large reinsurance programme
  - Vasicek-Herfindahl formula provided inappropriate factors
    - Unrated / lower rated debt
    - Bi-modal results
  - Inconsistent with spread risk
  - Use of Commercial rating agency ratings
    - Reins compelled to acquire
    - Fallibility / Reliance
  - Simplified approach in Q&A / CEIOPS website more practical

# SCR – Counterparty Risk

- Comments received:
  - Severe criticism for treatment of 'intermediary debt' by Non-Life Direct writers – essentially unrated debt => 97% loss regardless
    - No account of bonded schemes
    - Subject to different risks
    - Large number, diversification
    - Internal rating factors?



# SCR – Non-Life P&R Risk

- **Undertakings own experience**
  1. Mix, using weights undertaking own past experience with QIS 4 default – Premium risk only
  2. Replace one or subset of parameters by undertaking specific values provided parameters derived from same standardised methods, including distributional assumptions. Another distribution = Partial Internal Model
- General consensus that companies should be allowed to use company specific parameters – acknowledging credibility, validation

# SCR – Non-Life P&R Risk

## ■ (1) Mix, weight undertaking experience with QIS 4 default parameters

### Comments

- More stepped approach appreciated
- Justification of prior estimates – should reflect undertakings size and geographical diversification
- Own data should be given more credibility – e.g. firm with 15 years data and market leader
- Liability - requirements for a min of 7 years historic data 3 years after first written rules out use of company data for up to 10 years
- Difficulty in obtaining data in the suitable format – AY, QIS 4 splits
- Treatment of Outliers and CAT – double counting

# SCR – Non-Life P&R Risk

## ■ (2) Own parameters – CEIOPS methodology

### Comments

- Some criticism of mechanical nature – may not reflect the true underlying risk
- Standardised method as 1 option
- Use of portfolio specific parameters derived from internal systems an intermediate step to partial internal model
- Effort in using prescribed method, might as well use Partial Internal Model
- No alternative standardised approaches suggested

# SCR – Non-Life P&R Risk

## ■ Comments received:

- Underwriting cycle not appropriately allowed for
- Tariff increases leads to a higher SCR disregarding the rationale for the increase
- Increased historical volatility
- Should be a greater element of sensitivity to volume
- Should be allowance for expected Future Profits (or losses)
- Standard factors overly harsh?
- Market volatility by lines of business varies by country
- Miscellaneous – likely to be a mix of long-tail and short tail – understate / overstate risk
- Parameters do not reflect additional diversification from a large reinsurance book vs direct book (geographical diversification...)
- Further justification of calibration

# SCR – Non-Life CAT Risk

- Approximately a 50/50 split between companies using Method 1 or Method 3 (across Europe 60% used Method 2 or 3)
- Very large disparity when Method 1 compared to Method 3
- Irish Regulator did not prescribe a Regional Scenario (QIS3 was Liffey Flood)
- Method 1 criticised for not being sufficiently risk sensitive, allow for non-proportional reinsurance
- Other comments outlined difficulty / inability in deriving a '1 in 200' year event

	Minimum	25th Percentile	Median	75th Percentile	Maximum
Method 3 to Method 1	2.4%	34.5%	60.9%	100.0%	624.0%

# SCR – Non-Life CAT Risk

- Method 3
  - + most likely to take account of the specific risk exposures (large, medium?)
  - - difficulty in deriving, calibration
- One of biggest concern across regulators / industry is a level playing field
- Unlikely to be a Method 3 under the standard approach unless a consistent methodology of deriving the '1 in 200' year loss is found. Possible???
- In Europe regional based scenario tended to be well accepted – however still criticism of not being harmonised across Europe, not relevant to all firms
- Factor based approach a useful benchmark, particularly for smaller firms?

# SCR – Non-Life

## ■ Other

### □ Correlations

- Lack of transparency, further justification of factors
- Some comments recognising improvements, consistency in treatment of lines of business
- Grouping of lines rather heterogeneous e.g TPL combining EL and PL, lose some diversification benefits

### □ Geographical diversification seen as an improvement although some comment that too refined for standard approach / practical difficulties

- Herfindahl Index approach properly reflect div?
- Limited results
- Indicated reduction in volume measure up to 15%

### □ Guidance on Tax

# SCR - Health

- Limited Qualitative feedback
- Ongoing work in CEIOPS to understand what is classified as Health Care and vagaries of each specific country's market
- Health modules suitable???



# SCR – Operational Risk

- General Response
  - approach inadequate, arbitrary, not 'risk based'
  - no incentive to actively manage operational risk with this approach
  - inappropriate to assume 100% correlated to other risks
  - generally understates relative to own models (*median internal model 133% - European results, Life & Non-Life*)
  - arbitrary cap of 30% of SCR

Operational risk as a % of SCR	Min	10th	25th	Median	75th	90th	Max
Ireland overall	0.3%	1.9%	3.3%	5.7%	10.2%	19.2%	30.0%
Life	0.9%	1.4%	2.3%	4.5%	12.0%	23.7%	30.0%
Non-Life	0.3%	2.4%	4.5%	6.7%	9.8%	16.1%	21.4%

# SCR – Operational Risk

- No suggested alternative
  - Some comments regarding nascent literature on modelling CAT risk but not yet robust enough for public domain
- QIS 4 also attempted to gather information about company records of operational risk and first assessment of quality
  - Some companies indicate that they are gathering data
  - Historical data generally doesn't extend back beyond 3 yrs

# Operational Risk

All firms	Features of operational risk management		
	Yes	No	Planned
	No.	No.	No.
<b>All business segments</b>			
capture operational risk events and near misses in day-to-day management in practice?	21	4	5
capture the interrelations between the various risks identified?	10	13	7
quantify and keep a record of events and near misses?	18	5	7
categorise events and near misses?	15	8	2
introduced new mitigation techniques after events?	8	4	2
considering operational risk charge adequately designed?	3	21	

# MCR

- Reminder
  - $MCR\ NL = f(TP's, Premiums)$
  - $MCR\ Life = f(TP's, Cap\ @\ Risk, Exps\ UL)$
- Industry criticised Linear approach, whilst acknowledging that the corridor was an improvement
- Industry strongly in favour of MCR as a percentage of SCR
  - MCR less risk sensitive than SCR, deviating from Solvency II principles of risk sensitivity
  - Behave inconsistently, giving wrong / misleading messages
- Calculation caused little practical difficulty

# MCR

- European results suggest underlying calculation met the calibration target for Non-Life better than for Life
  - Table showing the percentage of companies whose MCR Linear / SCR ratio fell within the 20% to 50% corridor

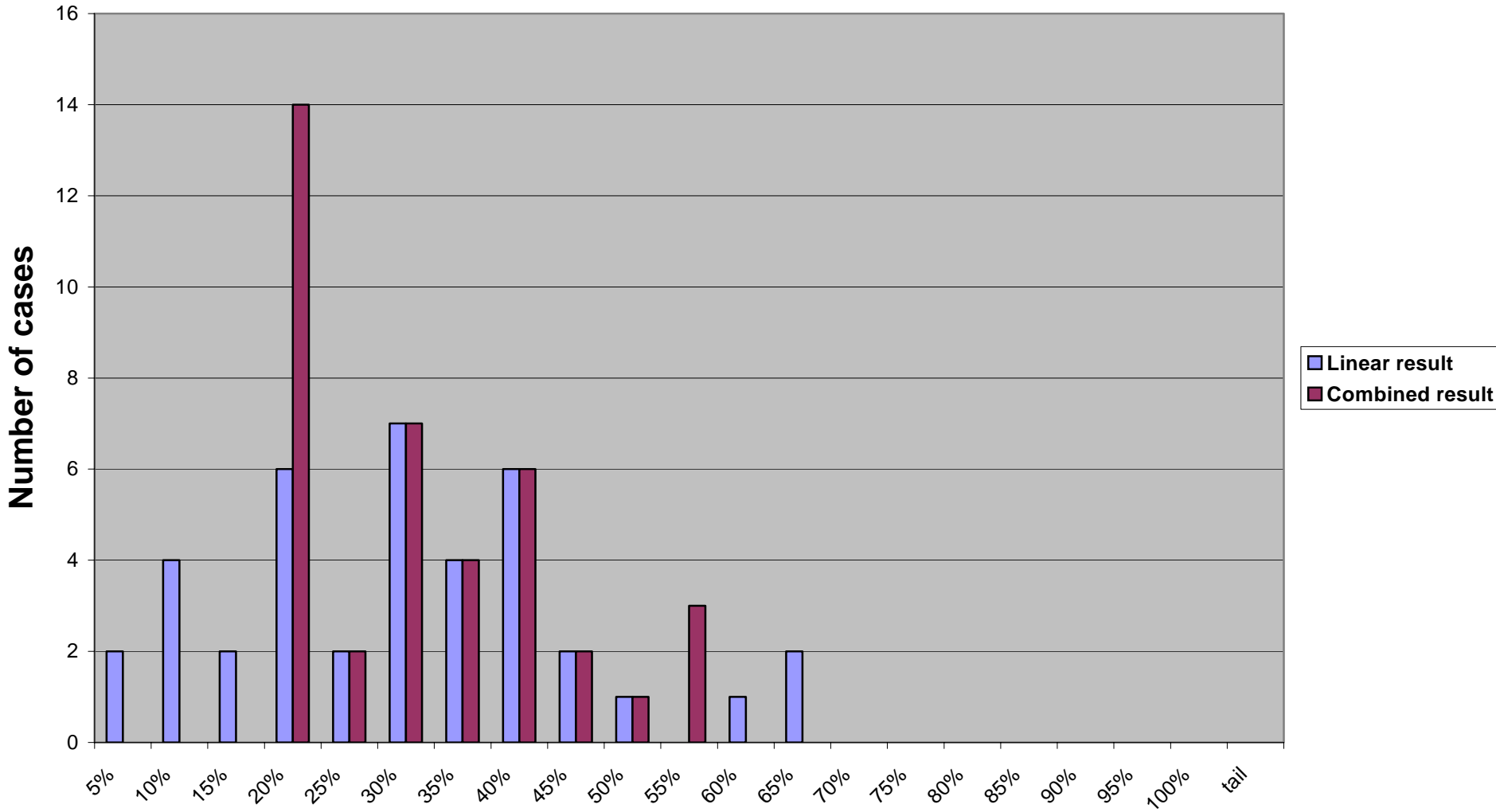
	Europe	Ireland
Life	44%	65%
Non-Life	66%	72%

# MCR

- For Irish submissions smaller companies tended to have a 'CAP'
- Floor most likely for Non-Life
  - Generally driven by relative size of CAT charge
  - Distorted somewhat by 'captives' – where SCR dominated by CAT risk, not included in MCR formula
- Cap and Floor equally likely for Life
  - Extreme values all relate to companies writing only unit-linked business
  - Extreme ratios more likely for Life
- Median MCR Linear / SCR
  - Life = 27%
  - Non-Life = 29%

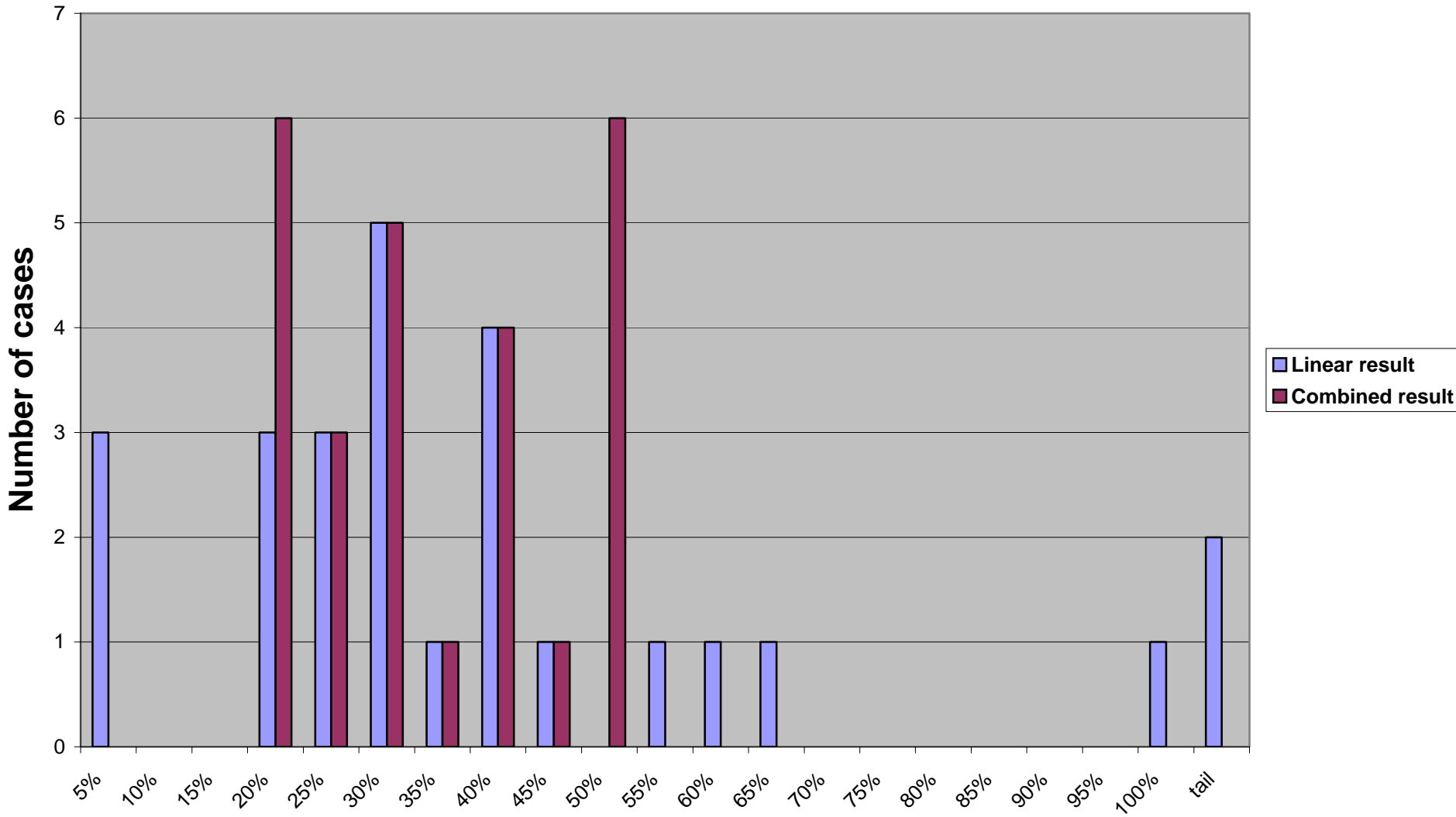
# MCR

## MCR linear and combined (Non-life)



# MCR

## MCR linear and combined (Life)





# Captives

- Received submissions from DIMA of representative companies and other submissions
- National Guidance – additional test of alternatives / simplifications
  - Recoverables from reins contracts and SPV's
  - Simplification for market interest risk
  - Currency Risk
  - Market Spread
  - Market Concentration
  - Counterparty Risk
  - Life Underwriting
  - Non Life Underwriting
- Haven't illustrated comparisons here as submissions under alternatives were a mix of approaches
- Annex in European report – illustrate impacts for the Luxembourg captive market

# Captives



- Alternative Captive submissions were under a mix of approaches some pure transition to national guidance, others not – including alternative CAT figures.
- Summary of outcomes
  - SCR approx 10% to 20% lower
  - UW risk approx 10% lower
  - Market Risk lower
    - Mainly driven by concentration risk, currency
    - Interest and Spread Risk higher
  - Under alternative submissions met SCR
- Annex in European report – illustrate impacts for the Luxembourg captive market

# Internal Models

- Too few submissions to form strong conclusions or illustrate Irish results
- Clear from comments made that a number of companies are actively using internal models, at least partially, for economic purposes

Internal models	Life	Non-Life
Already using internal models for some aspects of your business?	7	8
Actively developing and managing internal models for use in your business?	8	8
Do you have plans to use an internal model in the future at least partially?	6	13

# Internal Models

Ratio of internal model capital to standard formula capital  
Across European respondents

	Sample Size	25th	Median	75th
Health UW overall	14	20.5%	35.4%	65.8%
Health ST	15	34.0%	54.2%	90.7%
Non Life UW overall	44	63.0%	81.0%	101.6%
Prem & Res	52	53.5%	75.7%	99.4%
CAT	36	66.2%	100.0%	100.0%

# Other



- Group Solvency

- No submissions made on a group basis
- Majority of participants are members of groups and many contributed to group submissions to other supervisors
- Future of Group Support?

- Simplifications

General consensus is:

- appreciate the concept of simplifications
- however approach should reflect complexity and risk of business
- further work to understand impact vs standard approach

- European QIS 4 report published by CEOIPS in November

# To end

- Good news?
  - QIS 5 will not take place before April 2010
- Bad news?
  - QIS 5
  
- Thank you for your contributions to QIS 4!!

*Thank You*



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*Rialtóir Airgeadais*