



Banc Ceannais na hÉireann
Central Bank of Ireland

Eurosystem

QIS5 Workshops

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8th – 14th September 2010



Agenda

- Overview
 - Technical Provisions
 - Assets and Other Liabilities
 - SCR
 - Own Funds
 - Closing Remarks
 - Discussion
-



QIS5 Overview



Overview

- Objectives for QIS5 exercise
 - Requirements for QIS5
 - Timelines
 - Support Available
-



Objectives

- QIS5 is another test of the system
- CEIOPS: High Level of participation from solo undertakings (60%) and groups (75%). Request for more small undertakings to participate.
- In Ireland we are looking for **all** legal entities to participate.
- Main Issues
 - Calibration of Standard Formula
 - Groups Calculations
 - Internal Models
 - Test Complexity



Objectives

- To increase the level of preparedness of both industry and supervisors
 - QIS5 Results will be used to calibrate the Level 2 Implementing Measures
 - Results will also be used to assess the needs and contents of the Level 3 guidance relating to Pillar 1
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Requirements from Industry

- QIS5 will require a “better than best effort” response
 - Quantitative
 - Spreadsheets
 - Results on Standard Formula
 - Results from Internal Model
 - Impact of moving from SI to QIS5
-



Requirements from Industry

- Qualitative Questionnaire
 - A Part to be completed by all entities covering
 - General questionnaire (e.g. Preparedness for SII; difficulties in preparing and assessment of QIS5)
 - Valuation of assets and other liabilities
 - Technical Provisions
 - SCR
 - Own Funds
 - Questions related to Internal Models
 - Questions related to Groups (including Group Internal Models)



Requirements from National Supervisors

- High level review of each submission
 - Overview of results
 - Ensure no change to parameters in spreadsheet
 - For solo entities
 - Country Report
 - Aggregated Tables
 - Non Life and Health Underwriting Data
 - For Group Entities
 - For Internal Models
-



Timelines

- Solo entity submissions by 31st October
 - Group submissions by 15th November
 - National Supervisors produce country report to CEIOPS by end December
 - Group Reports by Lead Supervisors - Dec 2010
 - CEIOPS report – April 2011
-



Support

- These sessions
 - CEIOPS (updated regularly) and FR Q&A's
 - Spreadsheet (and manual), "helper tabs"
 - Actuarial Discussion forum and qis5@centralbank.ie
 - **Still need to read Technical Specifications (and errata)**
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Spreadsheet

- Available from QIS5 page of CEIOPS website
<http://www.ceiops.eu/index.php?option=content&task=view&id=732>
 - Manual and additional tools also available
 - Links from spreadsheet to technical specifications
 - If necessary, spreadsheet corrections planned for 7th and 21st September (plus 5th October for Groups)
 - Will refer to various tabs and support tools in presentation
-



- HOME / NEWS
- ABOUT CEIOPS
- REQUESTS FOR ADVICE
- CONSULTATIONS
- PUBLICATIONS
- PRESS ROOM
- REVIEW PANEL
- DISCLOSURE
- MEMBERS' AREA
- MEMBERS' MEETING
- MANAGING BOARD
- SUPERVISORY CULTURE
- WORKING GROUPS
- REVIEW PANEL
- 3L3 WORK
- DIRECTORIES
- INTERNAL PROCEDURES
- INFOHUB
- MEMBERS' AREA

Hi, ie-ifrsra
 Logout

QISS - Spreadsheets and IT Tools Print

Date	Core documents
24.08.2010	QISS spreadsheet
27.08.2010	Manual for the completion of QISS spreadsheet by solo undertakings
30.08.2010	Manual for the completion of the QISS internal models sheets
24.08.2010	Adapted Technical Specifications linked to spreadsheet Solo
24.08.2010	Qualitative questionnaire - solo
24.08.2010	Qualitative questionnaire - groups
24.08.2010	Qualitative questionnaire - internal models
24.08.2010	Qualitative questionnaire - Excel

Date	Documents: QISS Simplifications & Helper Tabs
27.08.2010	Simplification for technical provisions (TP.2.159 to TP.2.163, TP.7.59 to TP.7.63, TP.7.70 to TP.7.73, TP.7.83 to TP.7.88)
27.08.2010	Discounting tool (TP.3.1 to TP.3.11) covering also the calculation of technical provisions under stressed conditions (interest rate risk and liquidity premium risk)
27.08.2010	Non life best estimate (section V.2.2) / User guide
27.08.2010	Risk margin (TP.5.1 to TP.5.74)
27.08.2010	Spread risk (SCR.5.67 to SCR.5.103)
27.08.2010	Counterparty default risk (SCR.6.1 to SCR.6.58)
27.08.2010	Health Cat risk (SCR.8.95 to SCR.8.138)
27.08.2010	Adjustment for non proportional reinsurance (SCR.9.25 to SCR.9.28, Annex N)
27.08.2010	Natural Catastrophes risk (SCR.9.62 to SCR.9.92)
27.08.2010	Man made cat risk (SCR.9.93 to SCR.9.166)
27.08.2010	Undertaking specific parameters (SCR.10.1 to SCR.10.61)
27.08.2010	Concentration risk (SCR 5.104 to SCR 5.127)

Date	Document - User Manual and tools to extrapolate risk free curves
02.08.2010	User manual for CEIOPS risk free rate extrapolation tool
02.08.2010	Tool for extrapolating risk free rate curves
02.08.2010	Automatic macro - Tool for extrapolating risk free rate curves

[\[Back \]](#)



Captives



Captives

- 'Captive insurance undertaking' means an insurance undertaking, owned either by a financial undertaking other than an insurance or reinsurance undertaking or a group of insurance or reinsurance undertakings within the meaning of Article 212(1)(c) of the Framework Solvency II Directive or by a non-financial undertaking, the purpose of which is to provide insurance cover exclusively for the risks of the undertaking or undertakings to which it belongs or of an undertaking or undertakings of the group of which it is a member
 - The group of the captive undertaking does not include another insurance or reinsurance undertaking, other than another captive undertaking which meets the requirements (a) and (b)
-



Captives

- Simplifications will be limited to captives meeting the following requirements:
 - (a) (i) all insured persons and beneficiaries of the insurance obligations are legal entities of the group of the captive insurance undertaking
 - (a) (ii) all insured persons and beneficiaries of the underlying direct insurance contract of the reinsurance obligations are legal entities of the group of the captive insurance undertaking.
 - (b) The insurance obligations of the direct insurance captive undertaking do not relate to any compulsory third party liability insurance.



Captives

- Simplification should be proportionate to the nature, scale and complexity of the risks inherent in business of the captive undertaking.
 - Can make use of the general simplifications if the criteria of these simplifications can be fulfilled.
-



Technical Provisions



Technical Provisions

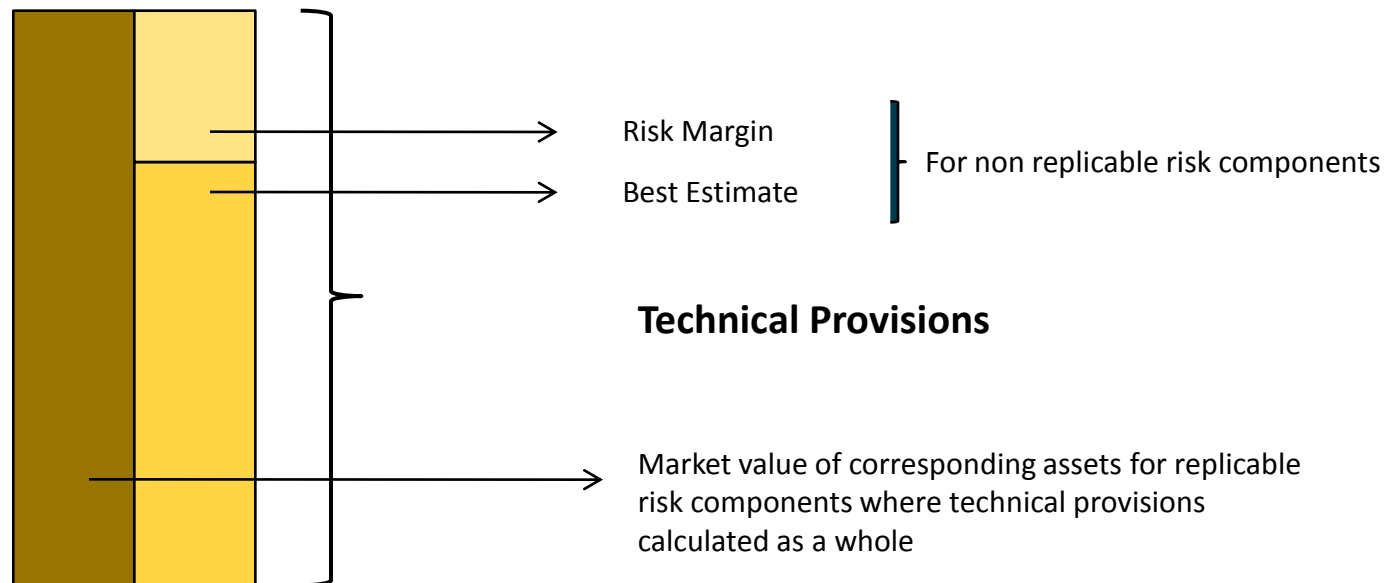
General Principles

- Transfer Value concept
 - Economic and Market Consistent Valuation
 - Can be calculated using
 - Replicating assets approach
 - Otherwise, “best estimate plus risk margin” approach
-



Technical Provisions

Components of technical provisions





Calculation of Technical Provisions as a whole

- Future cash flows which can be replicated reliably using financial instruments for which a reliable market value is observable
 - In this case separate calculations of the best estimate and the risk margin should not be required
 - Only expected to apply in very limited circumstances
 - Replicating assets must be traded in deep, liquid and transparent markets
 - Replicating portfolio should exhibit the same variability as well as the mean in all possible scenarios
-



Best Estimate

- The best estimate should correspond to the probability weighted average of future cash-flows taking account of the time value of money
 - Allow for the uncertainty in the cash-flows
 - Best estimate should represent the mean of the distribution of cash flow values
 - Allowance for uncertainty does not imply prudence
 - Should be calculated gross
 - Discount using the risk-free rate term structure
 - Only include future cash-flows associated with existing insurance and reinsurance contracts
-



Best Estimate

The following step by step guide may be useful:

- Consider all possible future scenarios
 - Estimate the likelihood/probability of each of those scenarios
 - Calculate the cash-flows receivable/ payable by the insurer in each of those scenarios
 - Discount the projected cash-flows to reflect the time value of money in each of those scenarios
 - Take the probability weighted average of the discounted cash-flows from each of those scenarios
-
- Spreadsheet: row 20, QIS5 Insurance Obligations tab



Risk Margin

- Required as part of the technical provisions to ensure that the transfer value is at least equivalent to that which an acquiring undertaking would expect i.e. To ensure a Market Consistent valuation is derived
- Determined using a Cost of Capital approach
 - Determine the amount of eligible own funds equal to the SCR for
 - underwriting risk
 - the unavoidable market risk (where **risk-free** market instruments are not available to hedge long-term exposures of portfolio)
 - credit risk
 - operational risk
 - Cost of Capital set at 6% above the risk free rate
- QIS5 permits for full diversification between lines of business in the risk margin calculation (within a geographical location)



Risk Margin - Simplifications

- Participating undertakings should consider whether or not it would be appropriate to apply a simplified valuation technique for the risk margin
- As an integral part of this assessment, the undertakings should consider what kind of simplified methods would be most appropriate for the business
- The chosen method should be proportionate to the nature, scale and complexity of the risks of the business in question
- The tech spec proposes an hierarchy of simplifications. An example for the risk margin includes the pro-rata projection of the SCR calculated at the outset in line with the key risk driver



Discount Rates

- Based on swap rates less a 10bps adjustment for credit risk
- Four risk-free interest rate term structures with varying allowances for illiquidity premium
- 100% illiquidity premium allowance
 - (for products where all premiums are already paid with longevity and expense risks being the only underwriting risks)
- 75% illiquidity premium allowance
 - (life assurance products with profit participation other than the above)
- 50% illiquidity premium – all other business
- QIS5 has requested an additional calculation in respect of business currently valued using market-based solvency 1 valuation rates (Article 20 B.a.ii of Consolidated Life Directive)



Segmentation - Life

Life products are segmented into one of 17 categories as follows:

- Segment by product category initially
 - Life insurance with profit participation clauses
 - Index-linked and unit-linked life insurance
 - Other life insurance
 - Accepted reinsurance
 - Annuities stemming from non-life contracts
- The first 4 categories above are further segmented by risk driver at inception:
 - Death
 - Survival
 - Disability, and
 - Savings contracts (with negligible insurance risk)



Segmentation – Non Life

Non Life products are segmented into one of 16 categories as follows:

- Medical expense insurance
- Income protection insurance
- Workers' compensation insurance
- Motor vehicle liability insurance
- Other motor insurance
- Marine, aviation and transport insurance
- Fire and other damage to property insurance
- General liability insurance
- Credit and suretyship insurance
- Legal expenses insurance
- Assistance
- Miscellaneous financial loss
- Non-proportional health reinsurance
- Non-proportional casualty reinsurance
- Non-proportional marine, aviation and transport reinsurance
- Non-proportional property reinsurance



Segmentation:

- Underlying principle:
 - Life: if life insurance techniques are used for the valuation
 - Non-Life: if non-life techniques are used for the valuation
- Existing annuities: these should be treated as life insurance obligations. An annuity exists once the annual annuity amount has been fixed. From that time on, the claim is only under longevity risk, expense risk and revision risk and life techniques are used for its valuation.
- Future annuities: these do not exist yet and hence the main risk of these claims is usually the uncertainty of the annual amount and this risk is not captured in the life u/w risk module. For this reason non-life techniques are usually used to value these claims.



Segmentation – SLT Health

- Health insurance which is pursued on a similar technical basis to that of life insurance (SLT Health) to be segmented under the disability/morbidity subsection as follows:
 - Insurance with profit participation
 - Index-linked and unit-linked insurance
 - Other life insurance
 - Annuities stemming from non-life insurance contracts
-



Segmentation – Non SLT Health

- Health insurance which is not pursued on a similar technical basis to that of life insurance (Non-SLT Health)
 - Medical expense
 - Income protection
 - Workers' compensation
-



Contract Boundaries

- Boundary defined as the point at which the undertaking can:
 - Unilaterally terminate the contract
 - Unilaterally reject the premium payable, and/or
 - Has an unlimited ability to amend premiums/benefits
 - The term unlimited is to be interpreted in an economic sense
 - Cashflows arising after this date do not belong to the existing contract
 - Time horizon: consider full lifetime of 'existing' obligations unless an accurate valuation can be otherwise achieved
 - Key issue for Life assurance business
 - Some examples considered on next slide
-



Contract Boundaries - Life examples

- Some examples:
 - **Single premium contracts**
 - **Unit-linked savings plan with no protection benefits**
 - Deferred Annuity with GAO
 - Voluntary automatic premium increases
 - Term Assurance with premium reviews
 - Post level term products
 - Plan with discretionary benefits
 - Unit-linked protection plan with 5 yearly reviews



Contract Boundaries - Non-Life examples

Some examples:

- Policy is renewed automatically each year at current premium rates for a further year unless the policyholder or insurer gives three months notice of cancellation
- Annual contract. There are no legal, commercial or other considerations that compel either the insurer or the policyholder to renew contracts. Past experience shows that the level of renewals is highly predictable. Or the insurer feels compelled to continue providing cover due to reputational reasons or because it is the sole provider
- Contracts with 'no-claims' discounts
- 5 year motor policy. Policy cannot be cancelled by the insurer without the occurrence of an accident or without cause, but may be cancelled by the policyholder in the event of premium increase. Premiums paid yearly. At the end of each year, the insurer can re-rate the contract, i.e. adjust for experience during the policy period, as well as make general rate increases. In practice, few policyholders cancel at the end of a policy year.
- Extended Warranty
- Reinsurance Contracts



Contract Boundaries

- Regular premium unit linked life insurance savings product with a mortality charge based on a published mortality table or based on overall portfolio performance
 - The undertaking will need to justify the contract boundary to the supervisor and this will include demonstrating that any restriction on the ability of the undertaking to amend the premium has economic relevance
-



Contract Boundaries

- Participating contracts:
 - the undertaking's ability to amend the discretionary benefits would not typically constitute an unlimited ability to amend premiums/benefits
 - the ability would only be considered unlimited if the contract did not provide guaranteed benefits (or not to a material extent) and the undertaking was free from any regulatory or contractual constraints to determine the discretionary benefits
-



Assets and Other Liabilities



Assets & Other Liabilities

Key Principles:

- Assets/Other Liabilities to be valued/settled at the amount for which they can be exchanged between knowledgeable parties in an arm's length transaction
 - Valuation to be carried out in conformity with IAS
 - IFRS Fair Value taken as a proxy for SII value
 - Tech Spec sets out some adjustments to align reported values with SII balance sheet
 - Financial Liabilities: no adjustments for subsequent changes in own credit standing
-



Assets & Other Liabilities

Valuation hierarchy set out as follows:

- Mark to market
- Mark to model
 - Maximise use of market inputs
 - Minimise use of non-observable inputs



Deferred Tax and Other Assets

- Deferred tax taken as difference between values ascribed to Balance Sheet items as per SII and Tax GAAP times the tax rate
 - Must be able to demonstrate that future taxable profits are probable and that the asset is realisable within a reasonable timeframe
 - Post employment benefits – use IAS19 but with the elimination of the smoothing corridor
 - Goodwill and intangibles valued at nil
 - Property always taken at fair value
-



Participations

Subsidiaries:

- Quoted market price
- Adjusted equity method

Other participations:

- Adjusted equity method
- Mark to model

Adjusted equity method: revalue assets and liabilities as in
SII



Financial Hedging

- Pro rata temporis used for risk mitigation techniques which cover only a part of the next year
 - Dynamic hedging : not a risk mitigation technique in QIS 5
 - Rolling hedge programme can be accepted under conditions
 - Taking into account of all the risks that can arise from the rolling over of the hedge
 - Hedging Instrument only be recognised where basis risk is immaterial
-



Solvency Capital Requirement



Solvency Capital Requirement

- Market Risk
 - Counterparty Default risk
 - Underwriting Risk (Life, Non Life, Health)
 - Loss Absorbing Arrangements
-



Market Risk



Market Risk

- Sub Modules
 - Interest Rate
 - Equity
 - Property
 - Currency
 - Spread
 - Concentration
 - Liquidity Premium

A green ribbon-style badge with the word "New" written in black text.

New



Market Risk - General

- Look at change in total NAV – assets and liabilities, but note spread and illiquidity premium risks
 - Calculate shocks before and after changes to future discretionary benefits if applicable
 - Based on actual assets held. Don't allow for any changes you would make if really SII, but comment in questionnaire
-



Interest Rate Risk

- Two shocks
 - entire yield curve up
 - and down
 - Variable shock along yield curve but level after 30 years
 - Minimum downward movement of 1%, subject to a minimum resulting rate of zero
 - Two separate sets of results with separate correlations into other Market Risks
-



Interest Rate Risk

- Helper tab to assist in calculation of liability movement
 - Input best estimate cash flows, liquidity bucket
 - Outputs best estimate TP, interest up and down shocks and illiquidity premium risk results
 - Still need to input results into main spreadsheet.
Tab "SF.SCR_G" rows 304+
-



Interest Rate Risk – Captive Simplification

- Assets are grouped by maturity in to simplified duration buckets as follows

Maturity of asset	Simplified duration
less than a year	0.5 year
between 1 and 3 years	2 years
between 3 and 5 years	4 years
between 5 and 10 years	7 years
above 10 years	12 years

- For each bucket, risk is $MV * duration * risk\ free\ rate * interest\ rate\ shock$



Interest Rate Risk – Captive Simplification

- For technical provisions calculate modified duration for each line of business
 - For each line of business, risk is
-BE * duration * risk free rate * interest rate shock
 - Separate calculation for each currency
-



Equity Risk

- Equity Shock of 30% for Global (i.e. EEA or OECD) and 40% for other
- Other: emerging markets; non-listed; hedge funds; and any other investments not included elsewhere in the market risk module
- Net of a 9% dampener due to low value of equities
- 22% for “Strategic Participations”
- 75% correlation between Global and Other
- Tab “SF.SCR_G” rows 318+



Property Risk

- Look through approach to underlying risks
 - Investments in direct land or buildings, or real estate companies for investment purposes are considered property
 - Investments in companies engaged in real estate management or real estate project development are considered equity
 - 25% drop in all real estate values
 - Tab "SF.SCR_G" rows 359+
-



Currency Risk

- Local currency is the currency in which your financial statements are prepared
- All other currencies are foreign
- Shocks for interest rate, equity and property ignore currency
- For each currency look at change in NAV for a +/- 25% move in currency
- A lesser shock applies between currencies pegged to Euro
- Result is the sum of the worst of the two for each currency
- Note error in tech spec which gives two conflicting ways of calculating result
- Tab "SF.SCR_G" rows 402+



Spread Risk

- Risk of credit spreads widening or other adverse credit movements
 - Covers various asset types with different treatment for each
 - Corporate bonds
 - Mortgage covered bonds
 - Sovereign and supranational debt
 - Structured products
 - Credit Derivatives
 - Interaction with Counterparty Default risk - one or other but not both
-



Spread Risk

- For Bonds requirements is
 $MV * \text{factor} * \text{mod duration}$
- Factor and restrictions on duration vary by bond type and credit rating
- No requirement for bonds issued or demonstrably guaranteed by EEA government
- Structured products based on higher of applying shocks directly to the product and or to the underlying asset
- For credit derivatives look at the higher of a widening (in absolute terms) or narrowing (in relative terms) of credit spreads
- Does not cover credit derivatives held for risk mitigation



Spread Risk

- Helper tab available
 - Input requires list of individual bonds with rating class and duration
 - More detailed inputs for structured
 - Simplified calculations for bonds are available
 - Tab "SF.SCR_G" rows 366+
-



Spread Risk – Captive Simplification

- May assume all assets are rated BBB
- For assets that are rated lower than BBB then no simplification is allowed



Concentration Risk

- Includes assets covered by equity, property and spread risk but not counterparty default risk
- Looks at impact on assets in each “name” above concentration threshold
- Concentration Threshold is 3% for A rating and above, 1.5% below this
- Loss ratio varies by credit rating or solvency ratio
- Special treatment for
 - Covered bonds
 - Property
 - Govt/Supra national
 - Participations



Concentration Risk

- Aggregated with zero correlation
 - Helper Tab available
 - Inputs required exposure by counterparty, by type, by rating class
 - Tab "SF.SCR_G" rows 409+
-



Concentration Risk – Captive Simplification

- Intra-group asset pooling arrangements may be exempted to the extent that there exist legally effective formal provisions where the captive's liabilities can be offset by intra-group exposures it may hold on entities of the group
 - Exemption threshold 15% if credit institution rated AA or above and they are not in the same group
 - A look-through approach to intra-group asset pooling arrangements may be applied under certain conditions
-



Illiquidity Premium Risk

- New sub module, introduced in line with liquidity premium allowance on technical provisions
 - Look at impact on technical provisions of liquidity premium reducing by 65%
 - Liabilities only despite technical specifications and errata referring to assets
 - Helper tab same as Interest Rate Risk
 - Tab "SF.SCR_G" rows 416+
-



Market Risk – Other Issues

- Collective Investment Vehicles. Look through principal
 - To actual underlying assets if known
 - If not use investment mandate
 - Otherwise treat as global or other equities
 - Non standard Investments – generally treat as other equity
-



Market Risk - Total

- Total market risk is aggregated using two separate correlation matrices
 - One for interest rate up shock, one for interest rate down shock
 - Correlation between spread risk and illiquidity premium risk is negative as correlations for spread risk are calibrated to spreads widening
-



Counterparty Default Risk



Counterparty Default Risk

- Includes risk-mitigating contracts, such as reinsurance arrangements, securitisations and derivatives, and receivables from intermediaries, as well as any other credit exposures which are not covered in the spread risk sub-module
 - Significant changes since QIS4 due to complex calculation and results not being intuitive
 - Module last of BSCR calculated
 - Calculation splits exposures between Type 1 and Type 2 (approximately rated and unrated)
-



Counterparty Default Risk – Type 1

- Covers
 - reinsurance arrangements
 - securitizations and derivatives
 - any other risk mitigating contracts
 - cash at bank
 - guarantees provided & deposits with ceding institutions ($N \leq 15$)
 - commitments called up but unpaid ($N \leq 15$)
-



Counterparty Default Risk – Type 1

- Calculation
 - $3 * \sqrt{V}$ if $\sqrt{V} \leq 5\% * \sum \text{LGD}$
 - $\text{Min} (\sum \text{LGD} ; 5 * \sqrt{V})$ else
- V = Variance of the loss distribution of the type 1 exposures
- Calculation of V given in SCR 6.14 of the Technical Specifications



Counterparty Default Risk – Type 1

$$V = \sum \sum u_{j,k} * y_j * y_k + \sum v_j * z_j$$

Where

$$y_j = \sum \text{LGD} \text{ and } z_j = \sum (\text{LGD})^2$$

$$u_{i,j} = p_i * (1 - p_i) * p_j * (1 - p_j) / [(1 + \gamma)(p_i + p_j) - p_i * p_j]$$

$$v_i = (1 + 2\gamma) * p_i * (1 - p_i) / [2 + 2\gamma - p_i]$$

$$\gamma = 0.25$$

p – probability of default, which varies by rating



Counterparty Default Risk – Type 1

- LGD obvious in some cases e.g. Cash at bank
- LGD complex for reinsurance, securitisation and derivatives
 - $\text{Max} [50\% (\text{Recoverable} + \text{RM} - \text{Collateral}) ; 0]$
 - Recoverable is best estimate as per Technical Provisions
 - Where RM is the Risk Mitigating effects on any of the other risk elements of the SCR
 - Collateral is a risk adjusted value
 - 50% changes to 90% if already in liquidation
- Simplifications are available



Counterparty Default Risk – Type 2

- Covers
 - receivables from intermediaries
 - policyholder debtors (including subrogation)
 - deposits with ceding institutions ($N > 15$)
 - commitments called up but unpaid ($N > 15$)
 - Calculation
 - 15% shock on values
 - Increased to 90% if past due date by more than 3 months
-



Counterparty Default Risk

- Type 1 and Type 2 aggregated with 75% correlation
 - Helper Tab available, need to enter all details for each counterparty, but all calculations are done
 - Tab "SF.SCR_G" rows 423+
 - Still not a simple calculation so looking for feedback and reports on any simplifications used via questionnaire
-



Non Life Underwriting Risk



Non-Life Technical Provisions

- Segmentation based on the nature of the underlying risk (not legal form)
 - Stochastic techniques not required
 - Allowance for reinsurer default – by counterparty and by line of business
 - Expenses to be allocated
 - Simplifications
-



Non-Life Technical Provisions - Simplifications

- Criteria for use of simplifications
 - general (no better method available) and
 - specific to each simplification
- Claim O/S
 1. Best estimate = no of reported claims x average cost per closed claims – claims paid to date
 2. Case by case approach – for small portfolios
- IBNR
 1. Average cost of IBNR * Formula that estimates number of IBNR
 2. Expected claim ratio, adjusted for commission and any expected future premium



Non-Life Technical Provisions – Simplifications (2)

- Premium provisions
 1. TP.7.81.
 2. Unearned premium * COR
 - Reinsurance recoverables
 1. Gross:net ratio
 2. Gross - net
-

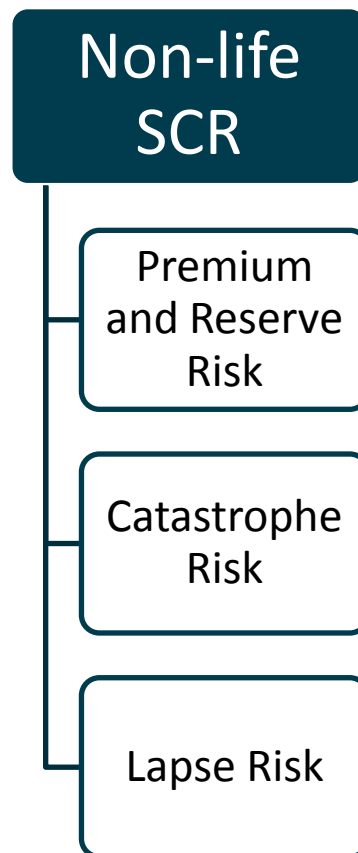


Proportionality

- Proportionate to nature, scale and complexity *of the underlying risks*
- Valuation methods should be
 - *“suitable to achieve the objective of deriving a market consistent valuation”*
 - *“no more sophisticated than is needed”*
- Size not the only relevant factor
- Risk profile primary guide
- Important to assess additional uncertainty (model error)
- Need *“reasonable certainty”* that model error is immaterial



Non-life SCR





Premium and Reserve Risk

- Non-proportional adjustment factors
 - Data requirements (7 variables per LOB)
 - Helper tab to do calculation
 - Premium risk applies to unexpired risks (incl. beyond 12 months), premium to be written over next 12 months and volatility of expense payments
 - Expense risk implicitly included
 - For convenience, volume measure inputs are in Technical Provisions tab
-



Premium and Reserve Risk – Captive Simplification

- For each LOB premium and reserve risk is

$$NL_{pr,lob} = 0.6 * \sqrt{(V_{pre,lob}^2 + 2 * 0.5 * V_{pre,lob} * V_{res,lob} + V_{res,lob}^2)}$$

- These are aggregated across lines using

$$NL_{pr} = \sqrt{(\sum NL_{pr,lob}^2 + 0.35 * \sum NL_{pr,r} NL_{pr,r})}$$



Premium and Reserve Risk – Captive Simplification

- For each LOB premium and reserve risk is

$$NL_{pr,lob} = 0.6 * \sqrt{(V_{pre,lob}^2 + V_{pre,lob} * V_{res,lob} + V_{res,lob}^2)}$$

- These are aggregated across lines using

$$NL_{pr} = \sqrt{(\sum NL_{pr,lob}^2 + 0.35 * \sum NL_{pr,r} NL_{pr,r})}$$

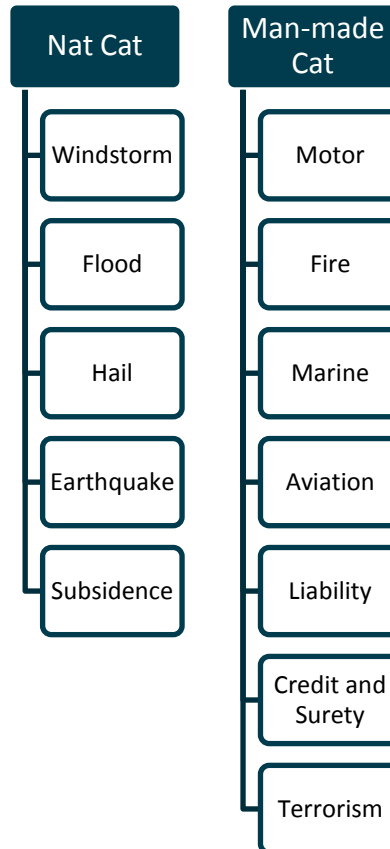


Undertaking Specific Parameters (USPs)

- For premium & reserve risk – use standard factors or USPs
 - Assume Supervisory Approval has been achieved (for QIS 5)
 - Are the methods appropriate? Which method (or combination of methods) is preferred and Why?
 - Data requirements and adjustments – SCR.10.19, 10.32, 10.47, 10.51 & **Annex O**
 - Do not want Cherrypicking, or “Blind” application of methods
 - Helper tab to do calculations
-



Catastrophe Risk





Catastrophe Risk

- Method 1
 - Scenario-based
 - Should be used where possible
- Method 2
 - Factor-based
 - For Non-EEA Natural Catastrophe, Non-proportional Reinsurance, Miscellaneous insurance lines
 - NOT a Partial Internal Model for QIS 5 (in practice, probably will be a PIM when SII is 'live')



Natural Catastrophe

- Only Windstorm applies to Ireland
 - Calculate gross loss then apply reinsurance programme
 - Max(1 big cat followed by one smaller, 2 medium)
 - Do this comparison at end (apply factors)
 - Need recoveries by counterparty for counterparty default risk module
 - Enter exposures by Cresta zone - helper tab to do calculation
-



Man Made Catastrophe - Motor

- For undertakings writing in Ireland only, the formula reduces to

$$GL_{MTPL}/(-\ln(0.995))/(F_{MTPL}*VY)$$

- Only input is VY
- Helper Tab to do calculation, macro needed when more than one country
- Do calculation gross then apply reinsurance programme



Man Made Catastrophe – Liability

- Premium by sub-line * Factor
 - Sub-lines:
 - Errors and Omissions
 - General Third Party Liability
 - Employers Liability
 - Directors and Officers
 - Helper tab to do calculation
 - Aggregation matrix in Helper tab – not in Tech Spec
-



Method 2

- Factor-based
 - Factors calibrated based on total premium exposed to peril
 - Premium to be allocated by risk
 - In practice, more likely that a PIM will be used – show PIM figure in IM tab
-



Lapse Risk

- New for QIS 5
 - Materiality threshold
 - Possible classes affected:
 - Motor premium payable monthly
 - Home Builders Warranty?
 - Securitisation business / Bond wraps (prepayment risk)
 - Multi-year policies (Reinsurance, Performance Bonds)
 - Other?
 - Stress assumptions used in Technical Provision calculation
-



Feedback on Qualitative Questionnaire

- Complexity of calculations
 - Appropriateness of Factors
 - Non-proportional factors
 - Data requirements for Cat risk modules
 - USPs - complexity, practicality, data standards
 - Lapse risk – materiality, practicality
 - Suggest alternatives
-



And finally...

- **READ THE TECHNICAL SPECIFICATIONS!**



Life Underwriting Risk



SCR – Life Underwriting Risk

- Summary
 - Very quick discussion for all risks
 - Mortality
 - Longevity
 - Disability / Morbidity
 - Revision
 - Expenses
 - Lapse
 - Catastrophe
-



Aggregation – New & Consistent Approach

	Mortality	Longevity	Disability	Lapse	Expenses	Revision	CAT
Mortality	1						
Longevity	-0.25	1					
Disability	0.25	0	1				
Lapse	0	0.25	0	1			
Expenses	0.25	0.25	0.5	0.5	1		
Revision	0	0.25	0	0	0.5	1	
CAT	0.25	0	0.25	0.25	0.25	0	1



Risk by Risk

- Longevity:
 - 20% decrease in mortality rates for all lives, and all terms
- Mortality:
 - 15% increase in mortality rates for all lives, and all terms
- Disability/Morbidity:
 - 35% increase in year 1
 - 25% increase in subsequent years
 - 20% reduction in recovery
- Expense:
 - Increase of expenses by 10%
 - Increase in expense inflation of additional 1%
- Simplifications available



Risk by Risk

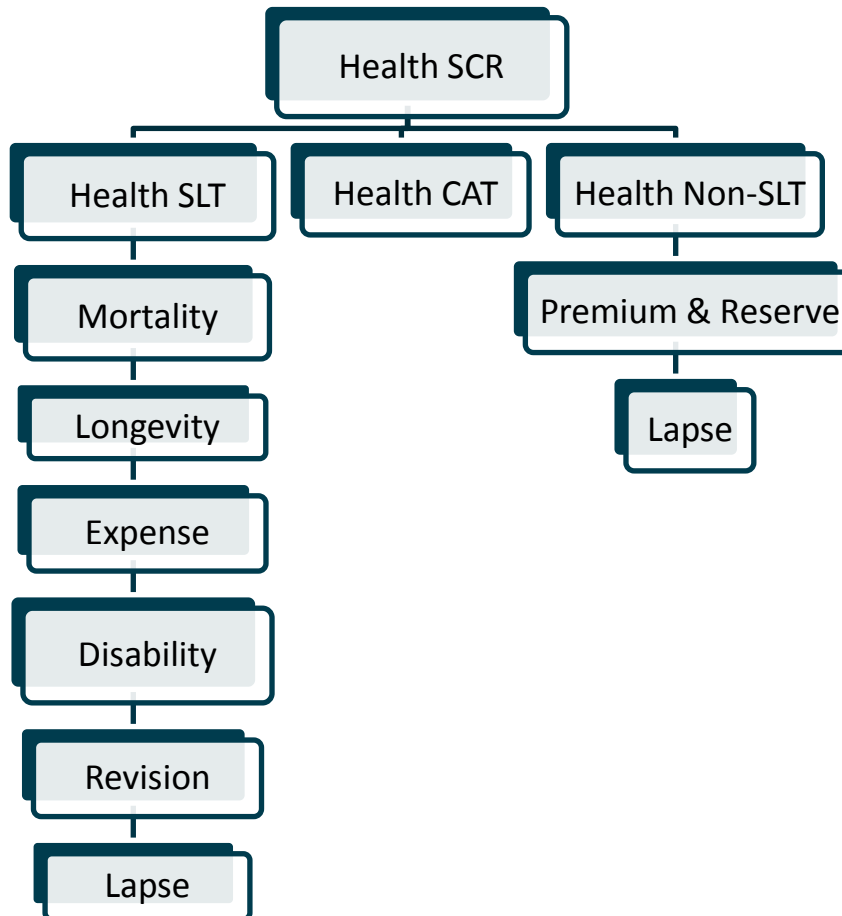
- Catastrophe: Overnight shock
 - Pandemic
 - 1.5 per mille (=0.15%) die
- Revision:
 - Risk of change of revision risk
 - Increase of 3% in the amount paid for annuities exposed to revision risk
- Lapse:
 - Worst of three scenarios
 - 50% lapse up
 - 50% lapse down
 - Mass lapse: 30% retail / 70% wholesale



Health Underwriting Risk



SCR – Health





Health SLT

- Most SLT Health sub-risks modelling apply the life sub-risks modelling
 - Mortality
 - Longevity
 - Expense
 - Revision (with an increase of 4% instead of 3% for annuities paid)
 - Lapse (increase/decrease of 20% instead of 50%)
- Disability/morbidity
 - split between medical expenses and income protection
 - income protection: based on the life disability-morbidity sub-module
 - medical expense: specific scenarios



Health SLT Medical Expense

- maximum impact of two scenarios
 - a permanent absolute increase of claim inflation (+1%) and a permanent relative change of claims (+5%)
 - a permanent decrease of claims inflation (-1%) and a permanent relative change of claims (-5%) for policies with premium adjustment mechanism
-



Non SLT Health

- Non-SLT modelling similar to Non-life premium and reserve underwriting risk
 - Lapse risk
-



Health CAT

- Arena disaster
- Concentration scenario
- Pandemic scenario

Aggregation of the 3 CAT results assuming independency

Correlation Health	Health SLT	Health Non SLT	Health CAT
Health SLT	1		
Health Non-SLT	0.5	1	
Health CAT	0.25	0.25	1

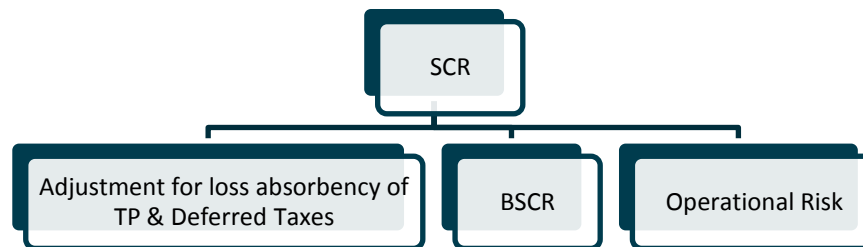


Loss Absorbing Arrangements



Loss Absorbing Capacity of TP & DTA

- Adjustment to take account of the risk mitigating effect provided by future discretionary benefits

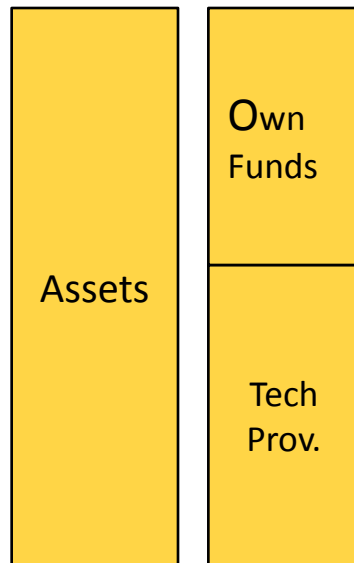


- Gross and net calculations are necessary to ensure that SCR is not understated and that there is no double-counting of loss absorbcency
- Two approaches prescribed to calculate the adjustment:
 - Modular approach
 - Single equivalent scenario



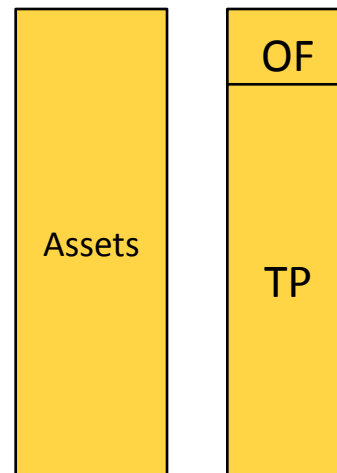
Loss Absorbency of Technical Provisions

Before Stress



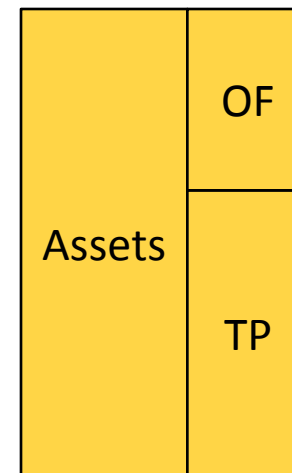
Post-Stress

No actions taken



Post-Stress

with mgt actions





Loss Absorbency of Technical Provisions

- Equivalent Scenario Approach
 - Single scenario in which all of the standard formula stresses occur simultaneously
 - Consider the management actions which would be taken were such a scenario to occur
 - The absolute level of the adjustment not to exceed the value of future discretionary bonuses
 - Deferred tax adjustment is defined as the reduction in deferred taxes which results when an instantaneous loss equal to the SCR is suffered
- Modular Approach
 - Capital requirements are calculated for a subset of risk modules separately and aggregated



Own Funds



Own Funds

Split into Basic Own Funds & Ancillary Own Funds

- Basic:
 - Defined: (Excess of assets over liabilities) + subordinated liabilities
 - Classified:
 - List / Tiers
 - By reference to criteria as capital items
 - Grandfathering criteria
- Ancillary
 - Defined: Can be called up to absorb losses / Off balance sheet
 - Classified
 - List / Tiers
 - By reference to treatment once called but notched down 1 tier



Own Funds

Tiering Criteria:

- Subordination
 - Loss Absorbency
 - Sufficiency of Duration
 - Incentives to redeem
 - Mandatory fixed charges
 - No encumbrances
-



Own Funds - Grandfathering

- Two approaches :
 - Application of S2 criteria
 - Comparison with grandfathering criteria
 - Both approaches flow through to results
 - Completion of Questionnaire
-



Own Funds – Reserve Items

- A. Identification of balance sheet items e.g share premium, retained earnings
 - B. Adjustment for foreseeable dividends
 - C. Solvency 2 items – effect of moving from accounts to S2 balance sheet
 - D. Reconciliation reserve – combines (C) with a reconciliation of excess of assets over liabilities
-



Own Funds - Adjustments

- Made to tier 1
 - Deduct – ring fenced funds – in excess of notional SCR - participations in financial and credit institutions
 - Relegate – deferred tax assets
 - Could be either – restricted reserves
 - Reinsurance treaties similar to Ring Fenced Funds
 - (where collateral is greater than TPs)
-



Own Funds - EPIFP

- Expected profits in future premiums
 - Quantified but not included as an adjustment in QIS5 results
 - Methodology based on 100% lapse shock
 - Other assumptions held – i.e. not surrender value
-



Own Funds – EPIFP Example

- Company A has a book of recently underwritten term business.
- Best estimate liability is negative owing to future profits yet to emerge (TP 1 = -100)
- Re-do technical provision calculation assuming 100% lapses; TP 2 = 0 in this example
- Change in tech provision is $0 - (-100) = 100$
- The change in TP is then subject to the $\max(0, x)$ restriction
- So, as long as there is a reduction in negative reserves owing to the 100% lapse/pup test, then this calculation produces an answer as to the limitations in loss absorbency of technical provisions.



Own Funds – Limits

- MCR – Tier 1 & Tier 2 only
- MCR must consist of $\geq 80\%$ Tier 1
- T3 Basic OF & Ancillary OF cannot contribute to MCR
- SCR
 - Tier 1 $\geq 50\%$
 - Tier 3 $\leq 15\%$
 - Hybrid capital instruments $\leq 20\%$ Tier 1



Closing Remarks



Spreadsheet Checklist – solo entities

- Participant tab – ensure all data entered
 - Valuation tab
 - All checks in column M “True”
 - Balance sheet balances!
 - Premiums tab –checks in column R “True”
 - “QIS5 insurance obligations” checks in columns L/W
-



Spreadsheet Checklist – solo entities

- On SCR_G tab
 - In first section that all risks are true or false as appropriate
 - When entering NAV's after shock that gross and net (of mitigation effect) are entered even if they are same
 - Ensure consistency between different tabs
 - Review Overview Sheet
-



Spreadsheet: Overview Tab

- Key source of information
 - Concise balance sheet, technical provisions and capital overview
 - Comparison of Solvency I and QIS5 balance sheets
 - Outlines asset coverage of MCR/SCR and tiering information
 - Composition of SCR by risk module and diversification offsets
-



Closing Remarks

- QIS5 is very complex
 - We don't expect to have covered everything that is relevant to all of you
 - There is no easy alternative except a full reading of the technical specifications and supporting documentation
-



Closing Remarks

- Feel free to continue to submit questions
 - Make a complete submission
 - Complete questionnaire and give as much feedback as possible
 - Highlight difficulties, complexities, absurdities and suggest improvements
 - Your final chance to influence SII calculations and calibrations
-



Discussion



Thank you
