QIS5 Workshop

SCR:Life & SLT Health Underwriting Risk Modules and MCR - Life

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OVERVIEW

- SCR Overview
- Life Underwriting Risk Sub-Module
  - Mortality
  - Longevity
  - Disability/Morbidity
  - Lapse
  - Expense
  - Revision
  - CAT
- SLT Health Underwriting Risk Sub-Module
- MCR Calculation

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SCR STANDARD CALCULATION APPROACH

- **Solvency Capital Requirement (SCR)** is the capital required to ensure that the (re)insurance company will be able to meet its obligations over the next 12 months with a probability of at least 99.5%
- Individual stress tests are applied for each risk
- Results of individual stress tests are aggregated using a correlation matrix to allow for diversification

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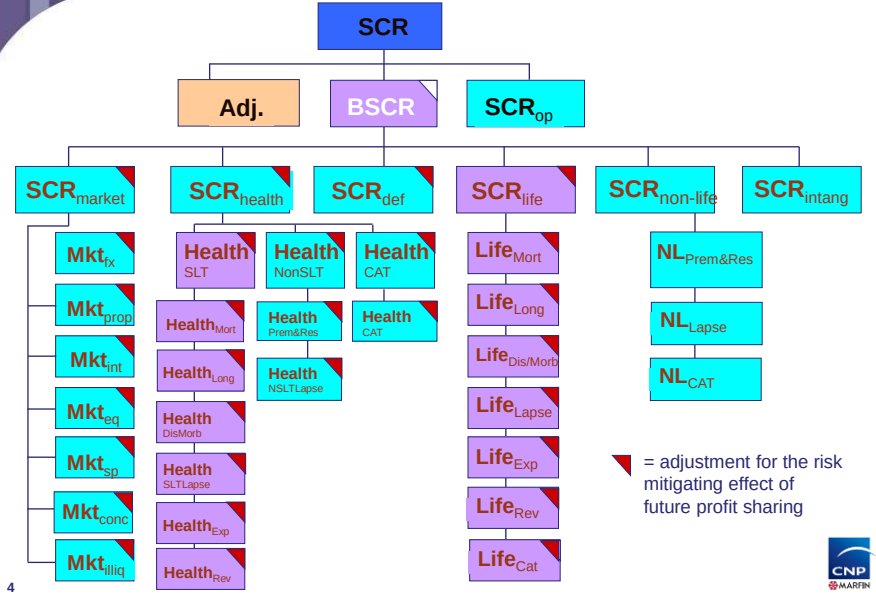
SCR OVERVIEW – QIS5



= adjustment for the risk mitigating effect of future profit sharing

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SCR Calculation(1/2)

SCR = BSCR - Adj + SCR $_{OP}$

BSCR

Aggregate risk capital for:
- Life
- Non-life
- Health
- Market
- Counterparty
- Intagibles

Adj

Adjustment for the risk absorbing effect of:

1) future profit sharing

2) deferred taxes

SCR $_{OP}$

Capital charge for operational risk (which does not benefit explicitly from diversification)

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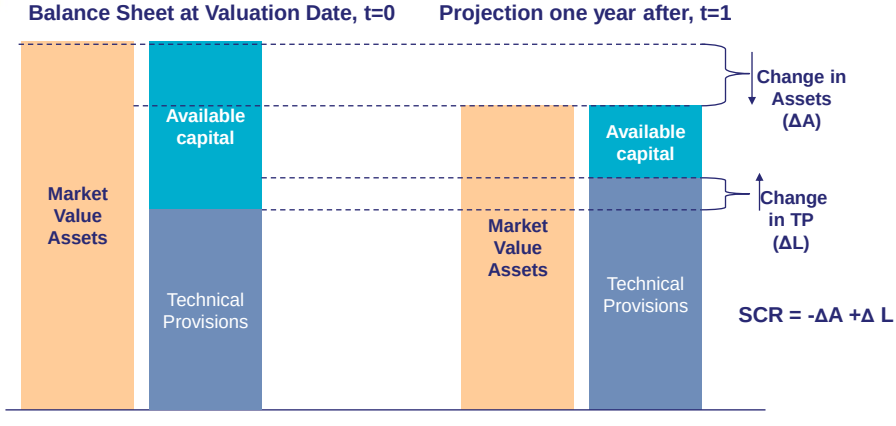
SCR Calculation (2/2)



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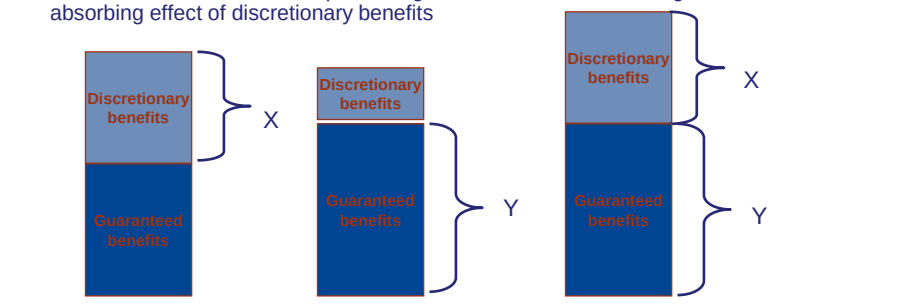
Loss Absorbency

- SCR can be reduced by taking into account the loss absorbency of technical provisions
- For each risk sub-module, capital charge must be calculated both gross and net of loss absorbing effect of discretionary benefits



Base: Best Estimate **Mortality shock: Net scenario** **Mortality shock: Gross scenario**

- Two approaches for the calculation of the adjustment for the loss-absorbency of technical provisions and deferred taxes are tested:
  - The equivalent scenario and
  - The modular approach

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Life Underwriting Risk

1. Mortality Risk
2. Longevity
3. Disability/Morbidity
4. Lapse
5. Expenses
6. Revision
7. CAT

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Correlations

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

The numbers in the parenthesis indicate the corresponding figures for QIS4 (when there is a difference)

Mortality Risk

- Applicable for (re)insurance obligations where the amount currently payable on death exceeds the technical provisions held
  - An increase in mortality rates leads to an increase in the technical provisions
- Capital requirement for mortality risk =

  Change in net asset value following a **permanent 15% increase** (10% in QIS4) in mortality rates
- Two calculations: one with no change in the value of future discretionary benefits and one with change
- Simplification:

  15% * Capital at Risk * Expected deaths for next year weighted by SA * (Duration) *$\{1.1^{(Duration-1)/2}\}$

Longevity Risk

- Applicable for (re)insurance obligations where there is no death benefit or the amount currently payable on death is less than the technical provisions held
  - A decrease in mortality rates is likely to lead to an increase in the technical provisions
- Capital requirement for longevity risk =

  Change in net asset value following a **permanent 20% decrease** (25% in QIS4) in mortality rates
- Two calculations: one with no change in the value of future discretionary benefits and one with change
- Simplification:

  20% * best estimate for relevant policies * Expected deaths for next year weighted by SA * (Duration) * $\{1.1^{(Duration-1)/2}\}$

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Disability/Morbidity Risk (1/2)

- Morbidity or disability risk is the risk of loss, or of adverse changes in the value of insurance liabilities, resulting from changes in the level, trend or volatility of disability and morbidity rates
- Applicable for (re)insurance obligations contingent on a definition of disability
  - Expected that majority of (re)insurance obligations related to this risk are covered by the corresponding health module
- Capital requirement for disability/morbidity risk = Change in net asset value following:
  - An **increase of 35%** in disability rates for the next year, a **25% increase** at each age in following years (25% in QIS4 for all years) and
  - Where applicable, a permanent decrease of 20% in disability recovery rates (no such shock for QIS4)
- Two calculations: one with no change in the value of future discretionary benefits and one with change

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Disability/Morbidity Risk (2/2)

- Simplification:

  35% * disability capital (yr1) * transition healthy/sick

+ 25% * dis capital (yr2) * trans healthy/sick * (Duration) * $\{1.1^{(Duration-1)/2}\}$

+ 20% * technical provisions for contracts subject to disability claims * transition sick/healthy, sick/dead * (Duration) * $\{1.1^{(Duration-1)/2}\}$

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Lapse Risk (1/2)

- Lapse risk is the risk of loss or change in liabilities due to a change in the expected exercise rates of policyholder options
  - Includes options to fully or partly terminate, decrease, restrict, suspend, renew, increase, extend the insurance cover
- Capital requirement for lapse risk ($Life_{lapse}$) = Change in net asset value in the most adverse scenario
- Most adverse scenario: results in the largest change in net asset value, taking into account the loss-absorbing capacity of technical provisions

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Lapse Risk (2/2)

- Lapse shock down

  50% reduction in the assumed option take-up rates in all future years for all policies without a positive surrender strain or otherwise adversely affected by the risk

- Lapse shock up

  50% increase in the assumed option take-up rates in all future years for all policies with a positive surrender strain or otherwise adversely affected by the risk

- Lapse mass

  combination of **30% surrender** of insurance policies with positive surrender strain other than policies in non-retail business and **70%** surrender if non-retail business (in QIS4: 30% surrender for all business)

- Simplification:

  $Lapse_{Up/Down} = 50\% \cdot l_{up/down} \cdot n_{up/down} \cdot S_{up/down}$

  l = avg. lapse rate; n = avg. period; S = sum of surrender strains

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Expense Risk

- Expense risk arises from variation in expenses
- Capital requirement for expense risk =

  Change in net asset value due to a **10% increase in future expenses** and **1% increase** per year of the **expense inflation rate** (QIS4: also allowed for recovery on adjustable loadings)

- Two calculations: one with no change in the value of future discretionary benefits and one with change
- Simplification:

  $Life_{exp} = 0.1 \cdot n \cdot E + \left(1/k^*((1+k)^n-1)-1/i^*((1+i)^n-1)\right) \cdot E$

  E = Expenses during last year; n = avg. period; i = expected inflation; k = i + 1%

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Revision Risk

- Revision risk is the risk of loss, or adverse change in the value of (re)insurance liabilities, resulting from fluctuations in the level, trend, or volatility of revision rates applied to annuities, due to changes in the legal environment or in the state of health of the person insured
- Applicable only to annuities where the benefits payable under the underlying insurance policies could increase due to changes in the legal environment or in the state of health of the person insured
- Capital requirement for revision risk =

  Change in net asset value due to **3% increase in annual amount payable for annuities** exposed to revision risk (same as in QIS4)

Catastrophe Risk

- Life catastrophe sub-module restricted to (re)insurance obligations contingent on mortality
- Catastrophe risk stems from extreme or irregular events whose effects are not sufficiently captured in the other underwriting risk sub-modules
- Capital requirement for catastrophe risk =

  Change in net asset value due to an **absolute increase of 1.5 per mille in the rate of policyholders dying** over the following year (as in QIS4)
- Two calculations: one with no change in the value of future discretionary benefits and one with change
- Simplification:

  $Life_{CAT} = \sum_i 0.0015 \cdot Capital\_at\_Risk_i$
  $Capital\_at\_Risk_i = SA_i + AB_i \cdot Annuity\_factor\text{-}BE_i$

SLT Health (Similar to Life Techniques) Underwriting Risk (1/4)

1. Mortality Risk
2. Longevity
3. Disability/Morbidity
4. Lapse
5. Expenses
6. Revision

SLT Health (Similar to Life Techniques) Underwriting Risk (2/4)

- Correlation matrix applied: as for Life Underwriting risk module
- Mortality, Longevity and Expense risks sub-modules are calculated exactly as for Life Underwriting risk module
- Revision risk capital requirement = Change in net asset value following a **4% increase** in the annual amount payable for annuities exposed to revision risk
- Lapse risk capital requirement: calculations as in lapse risk sub-module of Life Underwriting risk module but with **20%** instead of 50% changes in the Lapse up and Lapse down shocks

SLT Health (Similar to Life Techniques) Underwriting Risk (3/4) Disability/Morbidity Risk

- The SLT Health disability/morbidity risk covers the risk of loss, or adverse change in the value of (re)insurance liabilities, resulting from changes in the level, trend or volatility of the frequency or the initial severity of the claims, due to changes in:
  - disability, sickness and morbidity rates
  - medical inflation
- Must distinguish between
  - Medical expense insurance
  - Income protection insurance – treated in the same way as disability/morbidity risk in Life Underwriting risk module
- $Health^{SLT}_{\text{disability /morbidity}} = Health^{SLT}_{\text{medical}} + Health^{SLT}_{\text{income}}$
- $nHealth^{SLT}_{\text{disability /morbidity}} = nHealth^{SLT}_{\text{medical}} + nHealth^{SLT}_{\text{income}}$

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SLT Health (Similar to Life Techniques) Underwriting Risk (4/4) Disability/Morbidity Risk

***SLT* Health disability/morbidity risk for medical expense (re)insurance**

- Capital requirement not based on disability/morbidity probabilities
- A large part of the risk is independent from actual health status of insured
- Capital requirement = change in net asset value in the most adverse scenario
- Most adverse scenario: based on loss-absorbing capacity of technical provisions

Scenario	Permanent absolute change of claim inflation	Permanent relative change of claims
Claims shock up	+1%	+5%
Claims shock down	-1%	-5%

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Calculation of Minimum Capital Requirement (MCR) –Life (1/2)

- MCR is the minimum level of capital that the (re)insurance company must hold
- Can be considered as the capital required to ensure that the (re)insurance company will be able to meet its obligations over the next 12 months with a probability of at least 85%
- Combination of
  - Linear formula
  - A floor of 25% of SCR
  - A cap of 45% of SCR
  - An absolute minimum (€3.200.000 for life insurance obligations)

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Calculation of Minimum Capital Requirement (MCR) –Life (2/2)

$$MCR = \max\{\alpha_{c.1.1} \bullet TP_{c.1.1} + \alpha_{c.1.2} \bullet TP_{c.1.2}; WP\_Floor \bullet TP_{c.1.1}\} + \sum_{j \in \{c.2.1, c.2.2, c.3\}} \alpha_j \bullet TP_j + \alpha_4 \bullet CAR$$

Index	Segment	Factor
Volume measure: technical provisions		
C.1.1	participating contracts, guaranteed benefits	5%
C.1.2	participating contracts, discretionary benefits	-8.8%
C.2.1	unit-linked contracts without guarantees	0.5%
C.2.2	unit-linked contracts with guarantees	1.8%
C.3	non-participating contracts	2.9%
C.4	Capital at risk for all contracts	0.1%

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THANK YOU

ANY QUESTIONS?