

Solvency 2 Update

Solvency Capital Requirements

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Agenda



- Background from the Directive
- How is Solvency Capital Requirement calculated?
- Minimum Capital Requirements
- Own Funds
- CEIOPS Advice / Calibrations



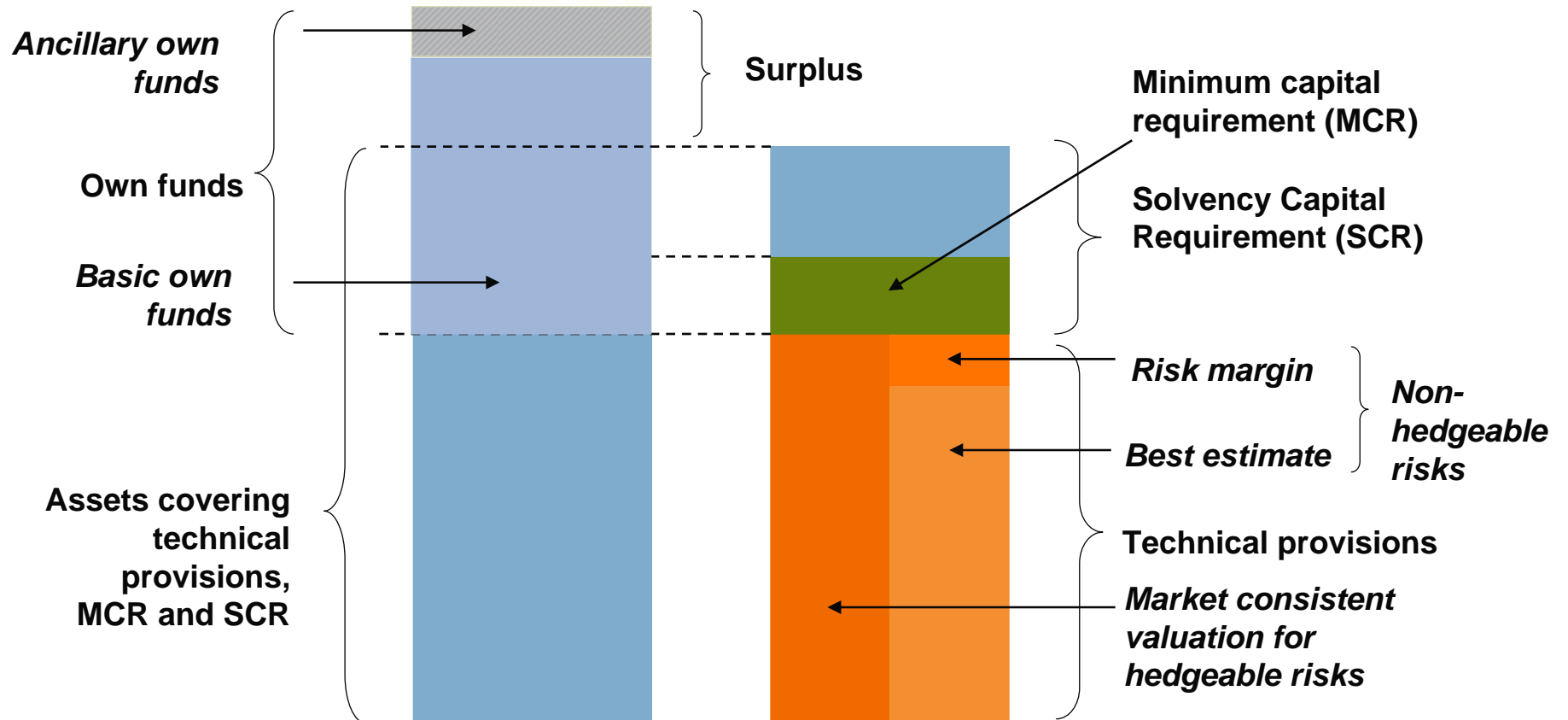
Objectives of SCR per the Directive

- Main objective of insurance and reinsurance regulation is the adequate protection of policyholders.
- Solvency II is expected to result in even better protection for policyholders.
- Capital requirements should be harmonised throughout the Community to achieve a uniform level of protection for policyholders.
- It is necessary to calculate solvency at group level for insurance and reinsurance undertakings forming part of a group.
- An economic risk-based approach should be adopted which provides incentives to properly measure and manage risks.
- Solvency requirements should be based on an economic valuation of the whole balance-sheet.
- Capital requirements should be covered by own funds

Economic Balance Sheet under Solvency II



slide 4



Solvency Capital Requirement should....



- Reflect a level of eligible own funds that enables .. undertakings to absorb significant losses and that gives reasonable assurance to policyholders ...that payments will be made as they fall due.
- Be determined as the economic capital in order to ensure that ruin occurs no more often than once in every 200 cases
or alternatively,
undertakings will still be in a position, with a probability of at least 99.5% to meet their obligations to policyholdersover the forthcoming 12 months.



What must be covered by the SCR?

- Going concern basis.
 - Cover existing business, as well as 12 months expected new business.
- Take into account all quantifiable risks
- Cover at least the following risks:
 - (a) non-life underwriting risk;
 - (b) life underwriting risk;
 - (c) health underwriting risk;
 - (d) market risk;
 - (e) credit risk;
 - (f) operational risk (*includes legal, excludes strategic and reputation*).
- Take account of the effect of risk mitigation techniques, provided that credit and other risks arising are properly reflected in the SCR.



Frequency of calculation

Insurance and reinsurance undertakings shall:

- calculate SCR at least once a year
- report result to the supervisor
- hold eligible own funds which cover the last reported SCR.
- monitor amount of eligible own funds and SCR on an on-going basis.
- If risk profile deviates significantly from assumptions underlying last reported SCR, must recalculate SCR without delay and report it to supervisor
(or supervisor may require recalculation of SCR)

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How is SCR calculated?

- Standard Formula
 - Standard Formula with undertaking specific parameters allows for the true risk profile to be better reflected
 - Standard Formula using simplified approaches in order to reflect the specific situation of small and medium sized undertakings
 - Partial Internal Model
 - Full Internal Model
- in accordance with risk-oriented approach to SCR
- to provide policyholders with an equivalent level of protection, internal models should be subject to prior supervisory approval on the basis of harmonised processes and standards.

Supervisor can dictate which approach must be used.

High Level Structure of Standard Formula

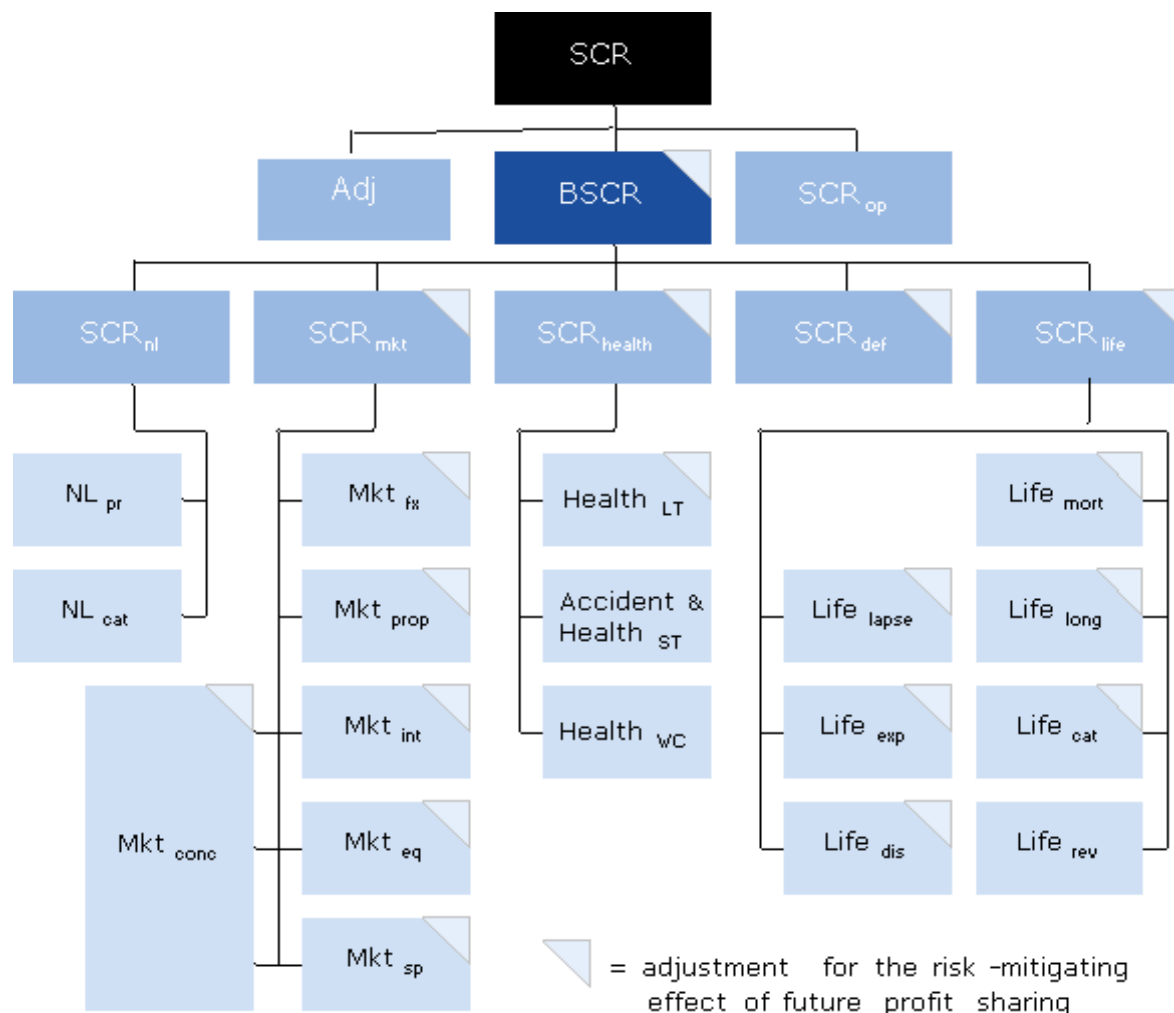


- SCR = sum of the following items:
 - Basic Solvency Capital Requirement
 - Capital requirement for operational risk
 - Adjustment for loss-absorbing capacity of technical provisions and deferred taxes

- Basic Solvency Capital Requirement
 - Individual risk modules
 - Aggregated allowing for correlations
 - Many of the risk modules use a Delta NAV approach
 - i.e. change in (Assets less Liabilities) under a given shock scenario
 - i.e. not simple factor based formulae as per Solvency I.



Diagram of Structure



Internal models must be approved by the supervisor and must meet the following tests...



Use test

- Demonstrate that model is widely used in and plays an important role in system of governance.
- Management body responsible for internal model.

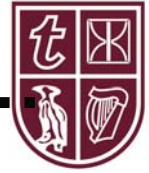
Statistical quality standards

- Probability distribution forecast based on adequate, applicable and relevant actuarial and statistical techniques
- Data must be accurate, complete, appropriate, updated at least once a year.

Calibration standards

- Can use a different time period or risk measure than 99.5% VAR over one year but must provide policyholders with an equivalent level of protection.
- Supervisors may require model runs on benchmark portfolios
 - to verify calibration of the model and
 - to check that its specification is in line with generally accepted market practice.

Internal models must meet the following tests..



Profit and loss attribution

- Review, at least annually, causes and sources of profits and losses for each major business unit.
- Demonstrate how the categorisation of risk chosen in the model explains the causes and sources.

Validation standards

- Regular cycle of model validation

Documentation standards

- Design and operational details
- Theory, assumptions, mathematical and empirical basis
- Demonstrate compliance with other tests
- Include indication of any circumstances under which internal model does not work effectively.



Capital Add-ons

- Supervisor may in exceptional circumstances set a capital add-on stating the reasons.
 - a) risk profile deviates significantly from assumptions underlying standard formula
 - and use of an internal model is inappropriate or ineffective; or
 - while a partial or full internal model is in development
 - b) risk profile deviates significantly from assumptions underlying internal model because certain quantifiable risks are captured insufficiently and adaptation of model has failed within an appropriate timeframe;
 - c) system of governance deviates significantly from the standards and that those deviations prevent it from being able to properly identify, measure, monitor, manage and report risks and other measures are unlikely to improve deficiencies sufficiently within an appropriate timeframe.
- Supervisor shall ensure that undertaking makes all efforts to remedy deficiencies
- Capital add-on reviewed at least once a year and removed when deficiencies are remedied.
- Capital add-ons must be disclosed (after transition period)

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Minimum Capital Requirement

- MCR = minimum level of security
below which the amount of financial resources should not fall
- When funds falls below MCR authorisation will be withdrawn,
if unable to re-establish funds at MCR within a short period of time.
- An adequate ladder of intervention between the MCR and SCR
- SCR = risk-sensitive requirement to ensure accurate and timely intervention
- MCR must be:
 - calculated in accordance with a simple formula
 - based on data which can be audited
 - subject to a defined floor and cap based on SCR



Which translates into

- Calibrated to Value-at-Risk subject to a confidence level of 85% over a one-year period
- Calculate MCR at least quarterly and report to supervisor
- Linear function of the (some of) following variables
 - technical provisions, written premiums, capital-at-risk, deferred tax and administrative expenses.
- MCR cannot fall below 25% nor exceed 45% of the SCR (corridor)
- Subject to an absolute floor
 - €1m for captives, €2.2m for non-life, €3.2m for life and reinsurance undertakings

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Own Funds



- Capital requirements must be covered by own funds.
- Not all financial resources provide full absorption of losses in wind-up and on a going-concern basis.
- Items should be classified in accordance with quality criteria into three tiers.
- Eligible amount of own funds to cover capital requirements should be limited accordingly.



First classification of own funds

Basic own funds

- excess of assets over liabilities
- subordinated liabilities.

Ancillary own funds

- other items which can be called up to absorb losses.
 - unpaid share capital
 - letters of credit and guarantees
 - any other legally binding commitments

Classification of own funds into tiers...



Classification depends on

a) permanent availability

item is available, or can be called up on demand, to fully absorb losses on a going-concern basis, as well as in wind-up

b) subordination

total amount of item is available to absorb losses and repayment is refused until all other obligations towards policyholders have been met

Consider:

- sufficient duration compared to duration of insurance obligations
- absence of incentives to redeem
- absence of mandatory servicing costs
- absence of encumbrances

Classification of own funds into tiers...



Tier 1

- Basic own funds which substantially satisfy (a) and (b)

Tier 2

- Basic own funds which substantially satisfy (a)
- Ancillary own fund which substantially satisfy (a) and (b)

Tier 3

- Everything else

Per Directive the vast majority of the excess of assets over liabilities should be treated as high quality capital (Tier 1).



Eligibility of Own Funds

To cover SCR

- Tier 1 > 1/3rd
- Tier 3 < 1/3rd

To cover MCR

- Tier 1 > 1/2
- No Tier 3

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Example Company



- Irish Non-Life & Health market data

Class of Business	GWP		Gross Tech Reserves	
	€m	% of Total	€m	% of Total
Motor	1,923	47%	4,861	51%
Property	885	22%	901	9%
Liability	711	17%	3,389	35%
Health	497	12%	295	3%
Other	48	1%	147	2%
Total	4,064	100%	9,593	100%



Example Company

- Balance Sheet – Solvency I basis
- Available capital €3,315m

Assets	Amount €m	% of Investments
Investments		
Govt Bonds	6,168	55%
Corporate Bonds	575	5%
Equity	1,726	15%
Property	709	6%
Cash	1,990	18%
Other Assets	3,095	
Total	14,263	

Liabilities	Amount €m
Gross Tech Reserves	9,593
Other Liabilities	1,355
Capital	3,315
Total	14,263

- Solvency II basis available capital €3,590m

Market Risk



- Fixed interest rate risk

Test	QIS 4	Consultation Paper
Fixed Interest Rate	Stress tests varies by term Volatility: None	New stress tests vary by term - All factors are higher - Larger increases for short (<10 years) and long (24 years) Volatility: 95% increase & 20% decrease

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
QIS 4	698	240	70	2,305	2,723	165	2,888
New Fix Int	701	240	70	2,305	2,725	165	2,890
Change (€m)	4	-	-	-	2	-	2
Change (%)	0.5%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%

Market Risk



- Equity

Test	QIS 4	Consultation Paper
Equity	Global 32% fall Other 45% fall Volatility: None	Global 45% fall Other 60% fall However, CP 69 does not give final advice Volatility: 60% increase & 15% decrease

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Fix Int	701	240	70	2,305	2,725	165	2,890
New Equity	917	240	70	2,305	2,838	165	3,004
Change (€m)	216	-	-	-	113	-	113
Change (%)	30.8%	0.0%	0.0%	0.0%	4.2%	0.0%	3.9%

Market Risk



- Property

Test	QIS 4	Consultation Paper
Property	All property 20% fall	Prime office, retail & warehouse 30% fall Other property 25% fall

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Equity	917	240	70	2,305	2,838	165	3,004
New Property	979	240	70	2,305	2,873	165	3,039
Change (€m)	62	-	-	-	35	-	35
Change (%)	6.8%	0.0%	0.0%	0.0%	1.2%	0.0%	1.2%

Market Risk



- Spread

Test	QIS 4	Consultation Paper
Spread	Corporate Bonds $MV(\text{Bond}) * \text{Modified Duration} * F$ F is function of credit rating only	Corporate Bonds $MV(\text{Bond}) * \text{Modified Duration} * F$ F is a function of credit rating and maturity Equivalent factors are higher

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Property	979	240	70	2,305	2,873	165	3,039
New Spread	1,061	240	70	2,305	2,921	165	3,086
Change (€m)	82	-	-	-	47	-	47
Change (%)	8.3%	0.0%	0.0%	0.0%	1.6%	0.0%	1.6%

Market Risk



- Currency, Concentration

Test	QIS 4	Consultation Paper
Currency	+/- 20%	+/- 25% Smaller tests for currencies pegged to €
Test	QIS 4	Consultation Paper
Concentration	Determine excess exposure to counterparty above the concentration threshold (CT) The CT factors depend upon the rating of the counterparty Apply the risk concentration charge (g) to the excess exposure	Same methodology but factors have changed The CT factors are lower The capital charges are higher for counter parties rated A or BBB, lower for AA & AAA

Market Risk



- Market Risk Correlations

Test	QIS 4	Consultation Paper
Mkt Correlations		Most factors were increased most notably Eq Vs Int from 0% to 50% Conc from 0% to 75% with most risks

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Spread	1,061	240	70	2,305	2,921	165	3,086
New Mkt Corr	1,214	240	70	2,305	3,013	165	3,178
Change (€m)	153	-	-	-	92	-	92
Change (%)	14.4%	0.0%	0.0%	0.0%	3.2%	0.0%	3.0%



Default Risk

- Covers reinsurance counterparties, securitisations, derivatives and other assets not covered by the spread risk module
- Methodology described in CP 51 is different from QIS 4
- Based on loss given default allowing for recovery rates – but recovery rates limited by CEIOPS advice
- Table below is CEIOPS own analysis in the case of a single counter party
- Other results are produced for more than one counter party

	QIS 4	Consultation Paper
AAA	0.20%	1.30%
AA	1.00%	3.00%
A	5.00%	6.70%
BBB	24.00%	24.50%
BB	100.00%	54.50%
B	100.00%	100.00%
CCC	100.00%	100.00%

- The capital charge for highly rated counter parts (AAA, AA & A) is now higher

Underwriting Risk



- Non Life

Test	QIS 4	Consultation Paper
Premium & Reserve Risk	Factors applied to Premium & Reserves	Same methodology Factors increased across all classes
Cat Risk	Factors applied to premium Internal model results allowed	New methodology & calibration with factors applied to GWP Company can apply its own reinsurance arrangements to gross cat Different (much higher) factors calibrated for captives Internal model results allowed

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Mkt Corr	1,214	240	70	2,305	3,013	165	3,178
New P&R	1,214	240	126	2,800	3,489	165	3,654
Change (€m)	-	-	56	495	476	-	476
Change (%)	0.0%	0.0%	79.9%	21.5%	15.8%	0.0%	15.0%

Underwriting Risk



- Non Life Correlations

Test	QIS 4	Consultation Paper
NL U/W Correlations	0% correlation between Cat and Premium / Reserve Risk	25% correlation between Cat and Premium / Reserve Risk

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New P&R	1,214	240	126	2,800	3,489	165	3,654
New NL Corr	1,214	240	126	2,907	3,589	165	3,754
Change (€m)	-	-	-	107	100	-	100
Change (%)	0.0%	0.0%	0.0%	3.8%	2.9%	0.0%	2.7%



Underwriting Risk

- Life

Test	QIS 4	Consultation Paper
Mortality Risk	10% increase in mortality rates	15% increase in mortality rates
Disability Risk	35% increase in disability rates for next year permanent 25% increase in subsequent years	50% increase in disability rates for next year permanent 25% increase in subsequent years 20% decrease in recovery rates for all year (where applicable)
Lapse Risk	More onerous of (1) Reduction of 50% in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be negative (2) Increase of 50% in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be positive (3) Capital charge for the risk of a mass lapse event (30% of the sum of the surrender strain over all policies where the surrender strain is positive)	More onerous of (1) Reduction of 50% in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be negative (2) Increase of 50% in the assumed rates of lapse in all future years for policies where the surrender strain is expected to be positive (3) Capital charge for the risk of a mass lapse event (30% of the sum of the surrender strain over all policies where the surrender strain is positive) For non retail business 70% of the sum of the surrender strain is used as the capital charge for the mass lapse event
Catastrophe Risk	Mortality / disability 1.5% increase in the rate of policyholders dying and experiencing morbidity over the following year (a simplified method may be used)	Mortality 1.5% increase in the rate of policyholders dying over the following year, morbidity test is removed

Underwriting Risk



- Life correlations

Test	QIS 4	Consultation Paper
Life Correlations		Some changes made to correlation matrix, most notably CAT risk now 25% correlated to other risks (was 0%) The correlation between disability and mortality was actually reduced from 50% to 25%

SCR



- SCR Correlations

Test	QIS 4	Consultation Paper
SCR Correlations		Some changes made to correlation matrix Health Vs Life + 50% Non Life Vs Life +25% Default Vs market +25%

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New NL Corr	1,214	240	126	2,907	3,589	165	3,754
New Total Corr	1,214	240	126	2,907	3,609	165	3,774
Change (€m)	-	-	-	-	20	-	20
Change (%)	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.5%

Operational Risk



- OP Risk factors

Test	QIS 4	Consultation Paper
Operational Risk	Factor based method Tech Provs Life 0.3% Tech Provs Non - Life 2.0% Premiums Life 3.0% Premiums Non - Life 2.0% Unit Linked factor 25% BSCR cap 30%	Factor based method Tech Provs Life 0.6% Tech Provs Non - Life 3.6% Premiums Life 5.5% Premiums Non - Life 3.8% Unit Linked factor 25% BSCR cap 30%

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
New Total Corr	1,214	240	126	2,907	3,609	165	3,774
New OP Risk	1,214	240	126	2,907	3,609	297	3,906
Change (€m)	-	-	-	-	-	132	132
Change (%)	0.0%	0.0%	0.0%	0.0%	0.0%	79.7%	3.5%

Summary – Overall Change



- Example company SCR increases by 35%
- Coverage of SCR reduces from 124% to 92%
- CEIOPS own analysis produced a 35% increase for Non Life companies

€m	Market Risk	Default	Health U/W	Non-Life U/W	BSCR	Op Risk	SCR
QIS 4	698	240	70	2,305	2,723	165	2,888
New CP	1,214	240	126	2,907	3,609	297	3,906
Change (€m)	517	-	56	602	886	132	1,018
Change (%)	74.1%	0.0%	79.9%	26.1%	32.5%	79.7%	35.2%



CEIOPS advice on Own Funds

- Refer to lessons from recent crisis
- Recommend stricter limits than in the Directive
 - To cover SCR
 - Tier 1 > 50%
 - Tier 3 < 15%
 - To cover MCR
 - Tier 1 > 80%
 - No Tier 3
- Recommend limits on Hybrid Capital (20% of Tier 1)
- Recommend that gap between going concern technical provisions and amount needed to wind up the company (the winding up gap) be treated as Tier 3 capital.
(i.e. VIF 'asset' is not Tier 1)

Appendices



Appendix – Market Correlations



	QIS4					
	Int	Eq	Prop	Spread	Conc	Fx
Int	100%	0%	50%	25%	0%	25%
Eq	0%	100%	75%	25%	0%	25%
Prop	50%	75%	100%	25%	0%	25%
Spread	25%	25%	25%	100%	0%	25%
Conc	0%	0%	0%	0%	100%	0%
Fx	25%	25%	25%	25%	0%	100%

	Consulation Paper					
	Int	Eq	Prop	Spread	Conc	Fx
Int	100%	50%	50%	50%	75%	50%
Eq	50%	100%	75%	75%	75%	50%
Prop	50%	75%	100%	75%	75%	50%
Spread	50%	75%	75%	100%	75%	50%
Conc	75%	75%	75%	75%	100%	50%
Fx	50%	50%	50%	50%	50%	100%

Appendix – NL Premium & Reserve Factors



	QIS4		CP71	
	Reserve	Premium	Reserve	Premium
Motor, third-party liability	12.0%	9.0%	12.5%	10.0%
Motor, other classes	7.0%	9.0%	12.5%	10.0%
Marine, aviation, transport (MAT)	10.0%	12.5%	17.5%	20.0%
Fire and other property damage	10.0%	10.0%	15.0%	12.5%
Third-party liability	15.0%	12.5%	20.0%	17.5%
Credit and suretyship	15.0%	15.0%	20.0%	20.0%
Legal expenses	10.0%	5.0%	12.5%	7.5%
Assistance	10.0%	7.5%	15.0%	10.0%
Miscellaneous	10.0%	11.0%	20.0%	20.0%
Non-proportional reinsurance – property	15.0%	15.0%	30.0%	30.0%
Non-proportional reinsurance – casualty	15.0%	15.0%	30.0%	30.0%
Non-proportional reinsurance – MAT	15.0%	15.0%	30.0%	30.0%
Health short term	7.5%	3.0%	12.5%	7.5%
Accident and other	15.0%	5.0%	17.5%	10.0%
Workers compensation	10.0%	7.0%	12.5%	10.0%

Appendix – Life U/W Risk Correlations



	QIS4						
	Mortality	Longevity	Disability	Lapse	Expense	Revision	CAT
Mortality	100%	-25%	50%	0%	25%	0%	0%
Longevity	-25%	100%	0%	25%	25%	25%	0%
Disability	50%	0%	100%	0%	50%	0%	0%
Lapse	0%	25%	0%	100%	50%	0%	0%
Expense	25%	25%	50%	50%	100%	25%	0%
Revision	0%	25%	0%	0%	25%	100%	0%
CAT	0%	0%	0%	0%	0%	0%	100%

	Consultation Paper						
	Mortality	Longevity	Disability	Lapse	Expense	Revision	CAT
Mortality	100%	-25%	25%	25%	25%	25%	25%
Longevity	-25%	100%	25%	25%	25%	25%	25%
Disability	25%	25%	100%	25%	50%	25%	25%
Lapse	25%	25%	25%	100%	50%	25%	25%
Expense	25%	25%	50%	50%	100%	50%	25%
Revision	25%	25%	25%	25%	50%	100%	25%
CAT	25%	25%	25%	25%	25%	25%	100%

Appendix – SCR Correlations



	QIS 4				
	Mkt	Def	Life	Health	Non Life
Mkt	100%	25%	25%	25%	25%
Def	25%	100%	25%	25%	50%
Life	25%	25%	100%	25%	0%
Health	25%	25%	25%	100%	25%
Non Life	25%	50%	0%	25%	100%

	Consultation Paper				
	Mkt	Def	Life	Health	Non Life
Mkt	100%	50%	25%	25%	25%
Def	50%	100%	25%	25%	50%
Life	25%	25%	100%	75%	25%
Health	25%	25%	75%	100%	25%
Non Life	25%	50%	25%	25%	100%