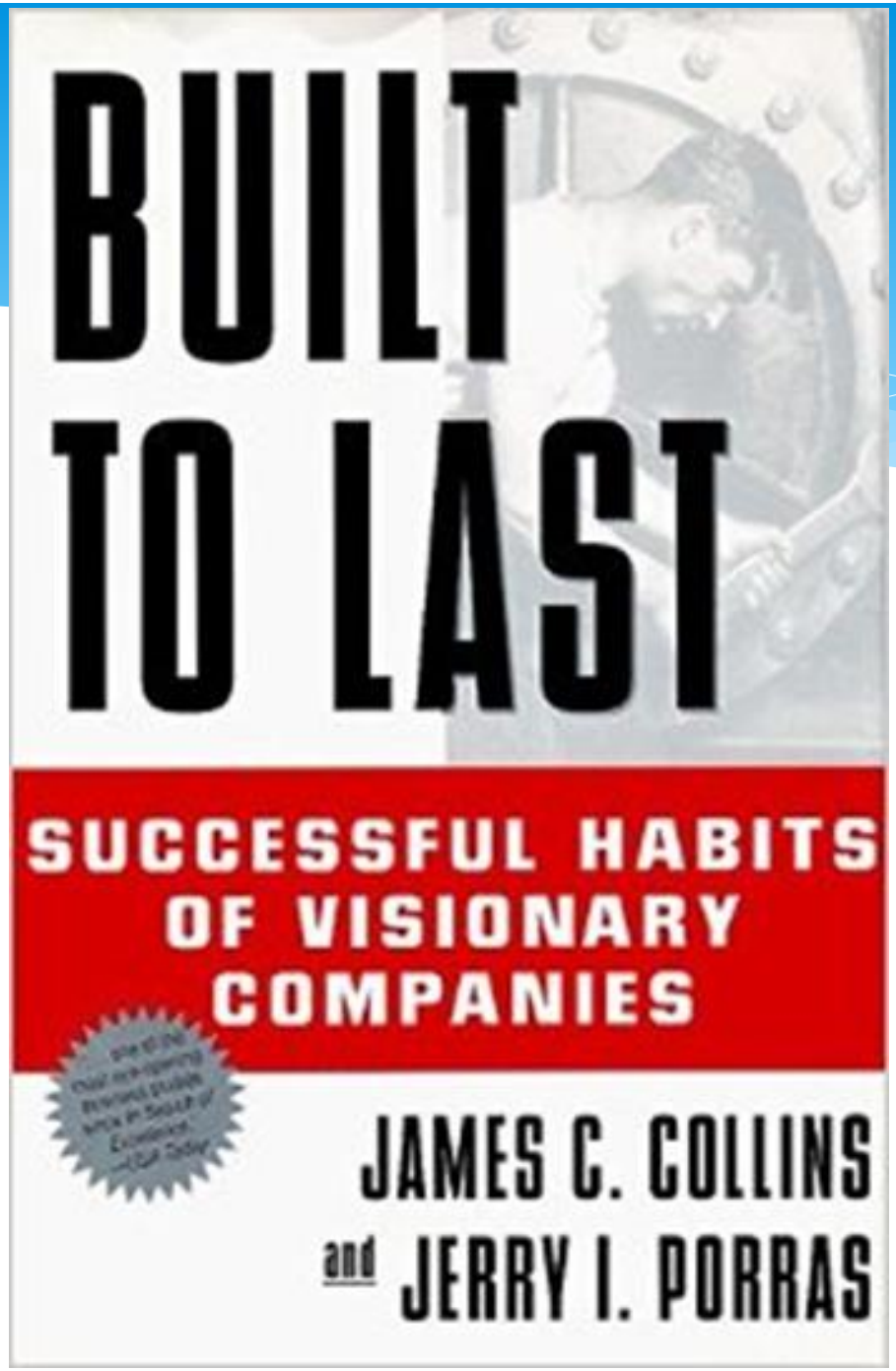


Your Insurance Cy , since 19XX …
Still going strong

continuiteit

pérennité

Directive 2009/138/EC of 25 nov 2009

* “On the taking up and pursuit of the business of Insurance and Reinsurance (Solvency 2) “

Of bij niet-continuiteiteit Bescherming cliënt

pérennité

Ou en cas de dificulté
Protection du client

What was wrong with Solvency 1 ?

Main features of Solvency 1

- Rudimentary « *fixed ratios* » model :
  The calculation of the required capital is based on objective factors (premiums, provisions)
- Simple calculation and great transparency

- Result in inconsistent capital requirement
- Not taking into account the real risk profile (the real factor of insolvency).

Eiopa gelooft dat wat zij oplegt aan maatregelen en berekeningen , de maatschappij ook voor meer als 90% nodig heeft om goed bestuurd te kunnen zijn … vandaar haar bewering dat de Solvency 2 geen

“extra effort” betekent ….

Basisreglementering :

Europese directive 2009/138/EU – Solvency 2 directive
Commission Delegated Regulation (EU) 2015/25 - Dedicated Acts

Belgische Reglementering

… Op komst

Belgische Reglementering

Projet	Ontwerp
Loi relative au statut et au contrôle des entreprises d'assurance ou de réassurance	**Wet op het statuut van en het toezicht op verzekerings- of herverzekerings-ondernemingen**

Solvency II

Applicable to every Insurer ?

No ….

Premium income (Gross) < 5 mEUR

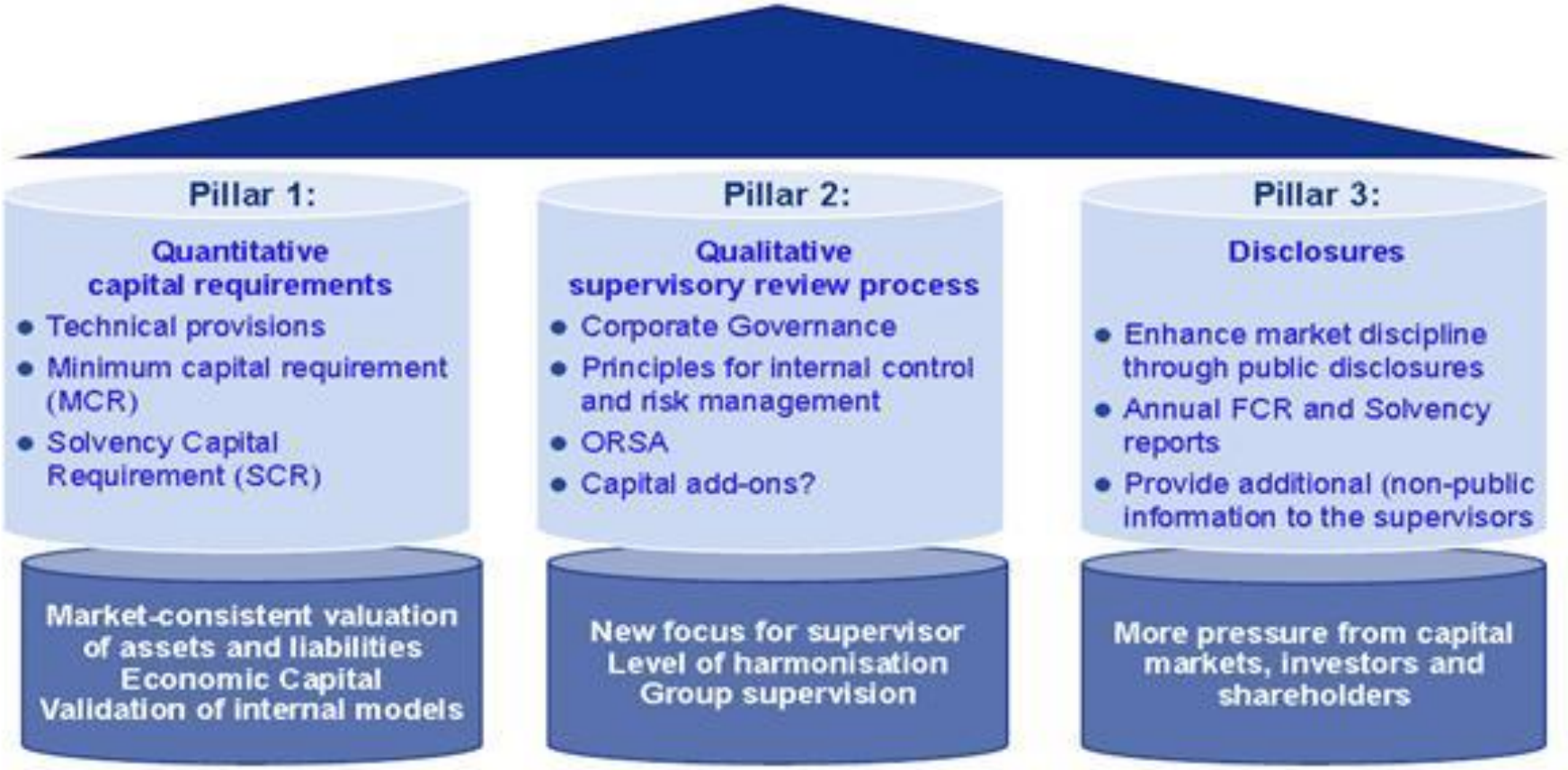
& Techn. Reserves (Net) < 25 mEUR

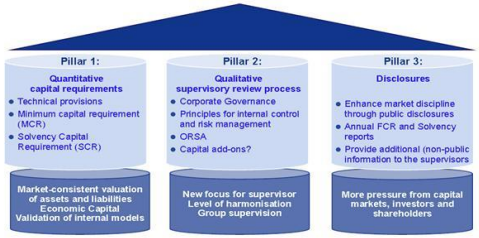
& Groupsconditions

& not Liability, Credit nor Surety

& Accepted Reinsurance < 0,5 mEUR , < 2,5 mEUR Reserves

& Accepted Reinsurance < 10% business total





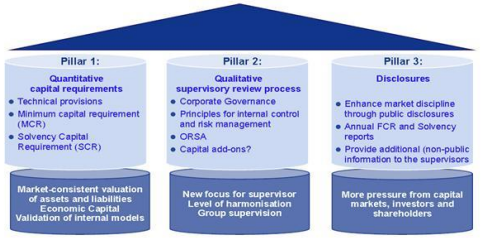
Market consistent evaluation of assets and liabilities

Investments –

Under Solvency II, there are no prohibitions on classes of assets, but, for all assets held, insurers need to be able to demonstrate that they comply with the **prudent person investment principles** (PPIP).

The PPIP requirements start from the premise that an insurer should be **free to invest** in any assets it chooses, provided that it **fully understands the risks involved**, makes **proper provision** for these (via the SCR), and that investment decisions are made in the best **interests of the policyholders**.

These requirements will necessitate a change in the way assets are considered, both before acquisition and during the lifetime over which they are held.



Market Consistent evaluation of assets and liabilities

Assets :

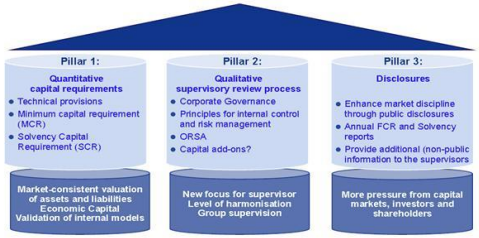
1. Market Value
2. Discounted Cash Flow at risk adjusted discount rates

Techn. Liabilities :

1. Best Estimate of Techn. Reserves +
2. Risk Margin (+- cost of capital of BE Reserves)

Other Liabilities :

Idem : see assets



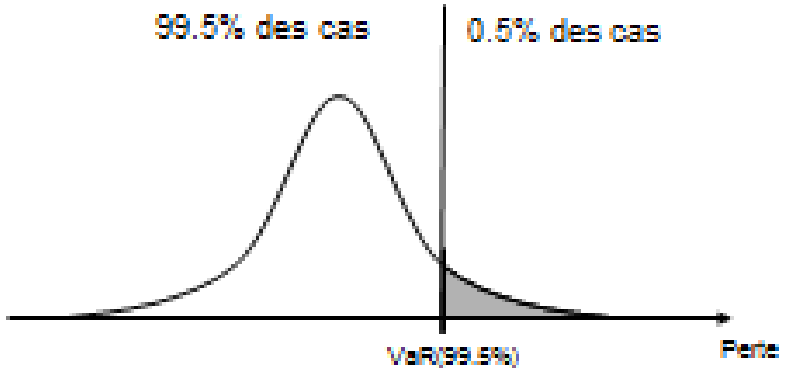
Market Consistent Balance sheet

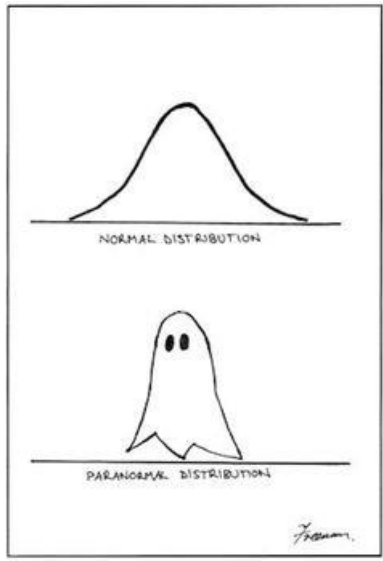
Own funds = Assets – Liabilities

Le concept de Solvency II
Notion Risque

- Pour chaque risque lié à la Compagnie, une masse de capitaux est exigée pour couvrir le risque au seuil de confiance de 99.5%, à un horizon d'un an, en d'autres termes, couvrir la perte inattendue en espérance tous les 200 ans. (0.5/100 = 200)

- VaR(99.5%) = Perte probable avec un seuil de confiance de 99.5%

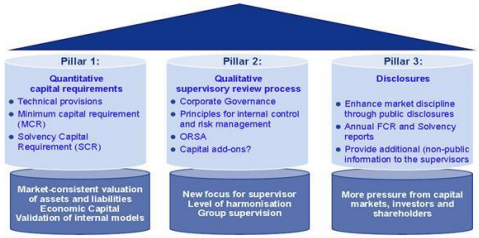




Hence, he notion of Black Swan….

Expect the unexpected ….

…. Once every 200 year

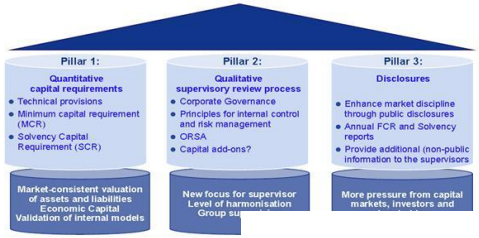


Minimum Capital Requirement

What simplified calculation :

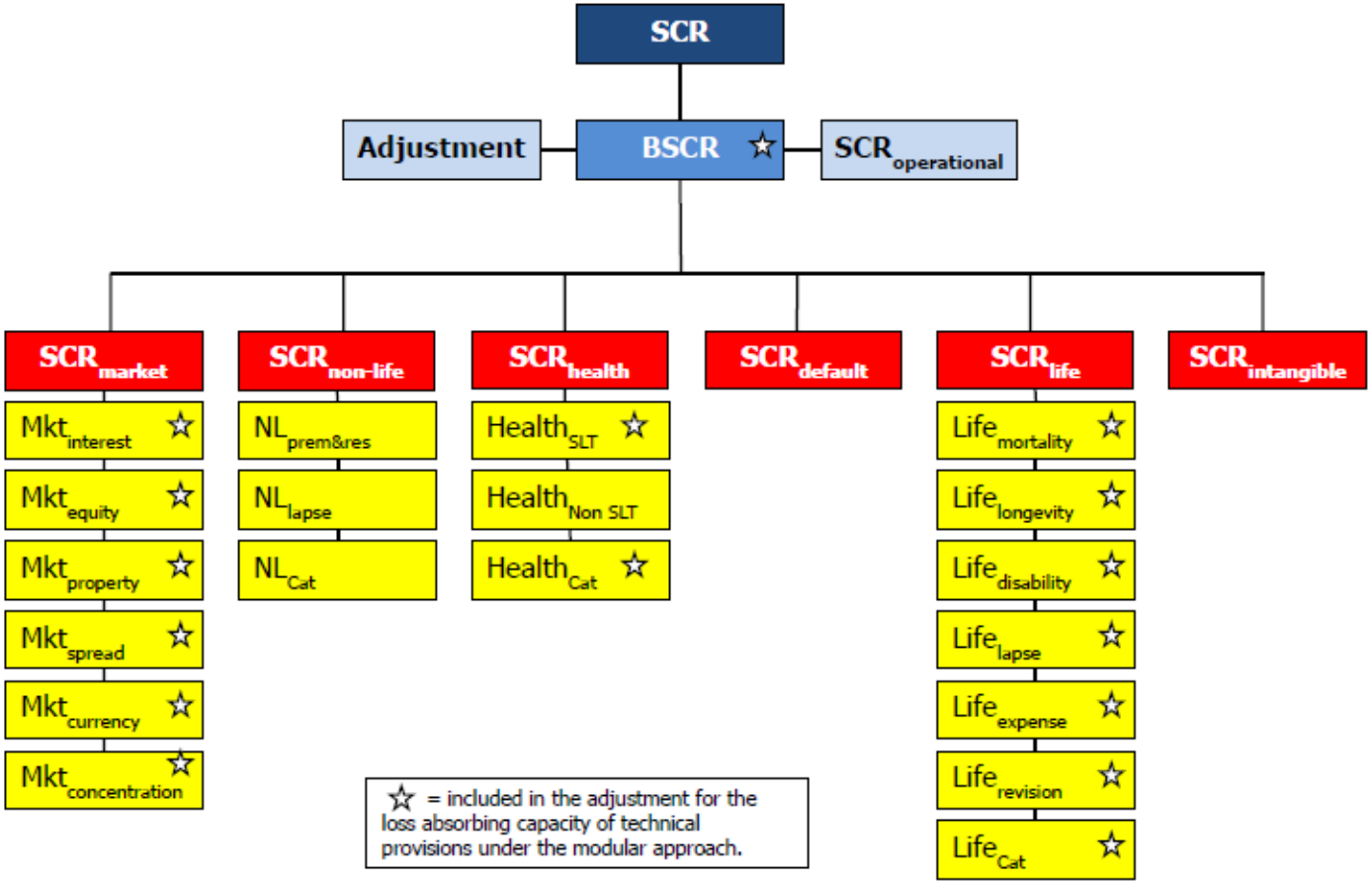
25% à 45 % of SCR Life + Non-Life

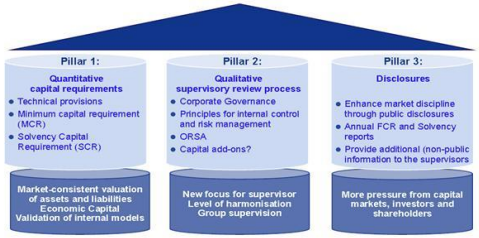
Factor based : % per LoB on Premiums and Reserves



Solvency Capital Requirement - SCR

SCR & Standard Formula

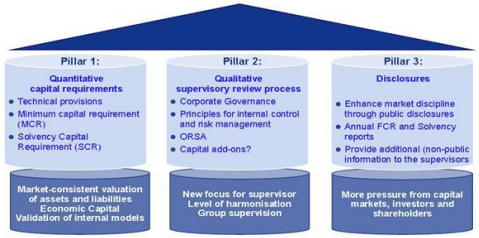




SCR – België QIS 5 (cijfers 31.12.2009)

Main components of SCR: Aggregated figures

mio €	Standard Formula (BE)	Solvency Ratio (BE)
SCR market	17.610 (59%[5])	
SCR counterparty default	1.170 (4%)	
SCR underwriting Life	3.810 (13%)	
SCR underwriting Non-Life	5.070 (17%)	
SCR underwriting Health	2.280 (8%)	
Diversification across modules	-11.000	
Basic SCR	19.000	132 %
Loss absorbing effect of profit sharing and deferred taxes	-7.590	
SCR operational	2.160	
SCR	14.000	179 %



Solvency Capital Requirement - SCR

Voor elke onderwerp :
1/200 jaar shock : toegepast op de Solv 2 balans

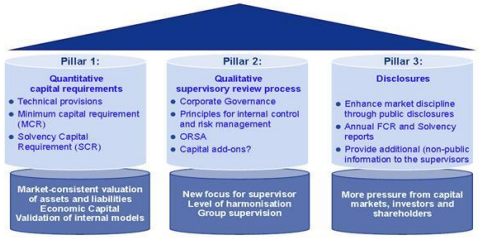
Individuele shocks worden op diverse niveaus geaggregeerd om totaal positie uit te komen

>>> voordeel van diversificatie

Impacten zijn zeer verschillend.

Opmerking : Buiten de “Standard Formula” zijn er ook nog :

- Intern model
- Partieel intern model
- Undertaking Specific Parameters (USP)



SCR – Aggregatie diverse risico's

Voor elke onderwerp :

1/200 jaar shock : toegepast op de Solv 2 balans

Individuele shocks worden op diverse niveaus geaggregeerd om totaal positie uit te komen

>>> voordeel van diversificatie

Impacten zijn zeer verschillend.

BSCR Calculation

$$BSCR = \sqrt{\sum_{ij} CorrSCR_{i,j} \cdot SCR_i \cdot SCR_j} + SCR_{Intangible}$$

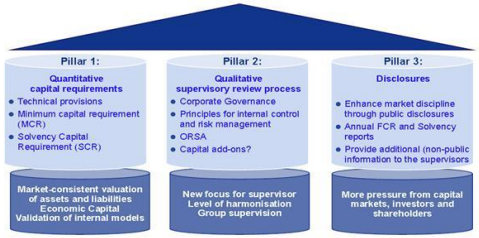
Five modules for main BSCR calculation i & j plus intangible module, as follows:

1) SCR_{mkt} = Capital charge for market risk.
2) SCR_{def} = Capital charge for counterparty default risk.
3) SCR_{life} = Capital charge for life underwriting risk.
4) SCR_{nl} = Capital charge for non-life underwriting risk.
5) SCR_{health} = Capital charge for health underwriting risk.

plus $SCR_{intangible}$ = Capital charge for intangible asset risk

Correlations:

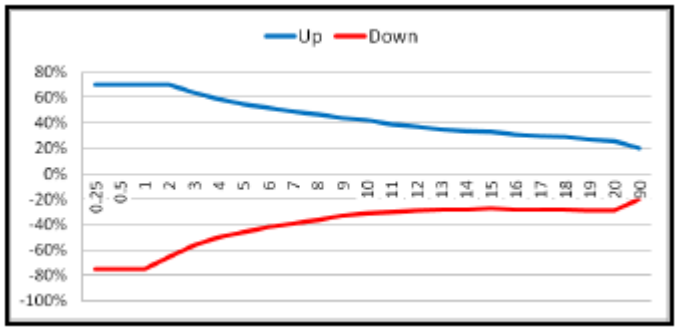
i / j	Market	Default	Life	Health	Non-Life
Market	1.00				
Default	0.25	1.00			
Life	0.25	0.25	1.00		
Health	0.25	0.25	0.25	1.00	
Non-Life	0.25	0.50	0.00	0.00	1.00



SCR – Market risk – Interest Rate Risk

Mkt_{int} = interest rate risk ☆

$$Mkt_{int} = Max(Mkt_{int}^{Up}, Mkt_{int}^{Down})$$

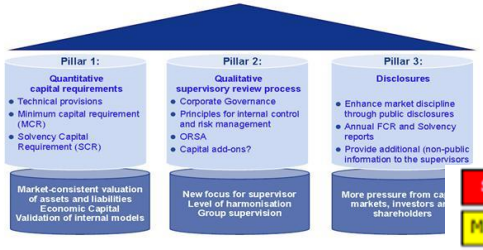


Term	Up	Down
0.25	70%	-75%
0.5	70%	-75%
1	70%	-75%
2	70%	-65%
3	64%	-56%
4	59%	-50%
5	55%	-46%
6	52%	-42%
7	49%	-39%
8	47%	-36%
9	44%	-33%
10	42%	-31%
11	39%	-30%
12	37%	-29%
13	35%	-28%
14	34%	-28%
15	33%	-27%
16	31%	-28%
17	30%	-28%
18	29%	-28%
19	27%	-29%
20	26%	-29%
90	20%	-20%

Shocks, up and down, toegepast op “open ALM posities”

Opgelet : Equity & Property : Duration **0**

SCR – Market risk – Equity risk



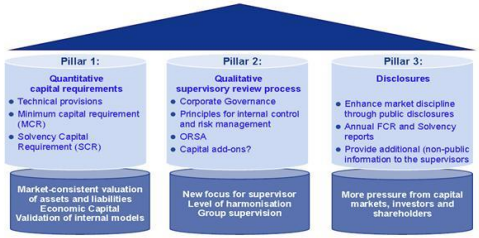
Mkt_{eq} = equity risk* (cont)

	Type 1	Type 2
Equity Shock$_i$	39 %	49%

+ symmetric adjustment + 10% / - 10%

Dus max beursgenoteerde : 49% (type 1)
min beursgenoteerde : 29% (type 1)

The symmetric adjustment is included due to the following objectives:
1) To avoid (re)insurers being unduly forced to raise additional capital or sell their investments as a result of adverse movements in markets;
2) To discourage or avoid fire sales which would further negatively impact the equity prices – i.e. prevent a pro-cyclical effect of the capital requirements which could have a potential destabilizing effect on the economy.

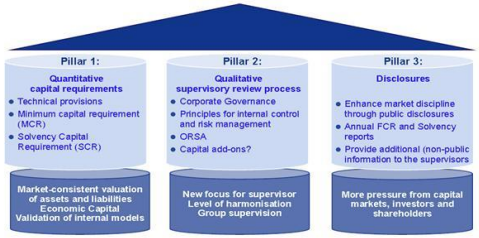


SCR – Market risk – Property

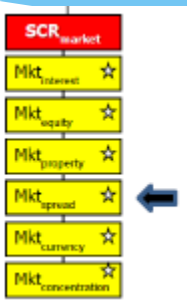
$$Mkt_{prop} = \text{property risk}^{\star}$$

$$Mkt_{prop} = \Delta BOF|_{\text{property shock}}$$

Property Shock = 25% for all property types



SCR – Market risk – Spread Risk



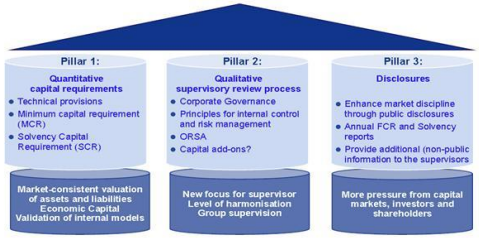
Mkt_{sp} = spread risk – bonds

1) Bonds (cont)

$$Mkt_{sp}^{bonds} = \sum_i MV_i \bullet F^{Up}(rating_i, duration_i)$$

$duration_i$ (d_i) years	Rating AAA	AA	A	BBB	BB	B	CCC or lower
Upto 5	0.9% * d_i	1.1% * d_i	1.4% * d_i	2.5% * d_i	4.5% * d_i	7.5% * d_i	7.5% * d_i
> 5 & =/< 10	4.5%+0.5%*(d_i-5)	5.5%+0.6%*(d_i-5)	7.0%+0.7%*(d_i-5)	12.5%+1.5%*(d_i-5)	22.5%+2.5%*(d_i-5)	37.5%+4.2%*(d_i-5)	37.5%+4.2%*(di-5)
> 10 & =/< 15	7.2%+0.5%*(d_i-10)	8.4%+0.5%*(d_i-10)	10.5%+0.5%*(d_i-10)	20%+1.0%*(d_i-10)	35%+1.8%*(d_i-10)	58.5%+0.5%*(d_i-10)	58.5%+0.5%*(di-10)
> 15 & =/< 20	9.7%+0.5%*(d_i-15)	10.9%+0.5%*(d_i-15)	13%+0.5%*(d_i-15)	25%+1.0%*(d_i-15)	44%+0.5%*(d_i-15)	61%+0.5%*(d_i-15)	61%+0.5%*(di-15)
Over 20	12.2%+0.5%*(d_i-20)	13.4%+0.5%*(d_i-20)	15.5%+0.5%*(d_i-20)	30%+0.5%*(d_i-20)	46.6%+0.5%*(d_i-20)	63.5%+0.5%*(d_i-20)	63.5%+0.5%*(di-20)

	AAA	AA	A	BBB	BB	B
1 year	0.9%	1.1%	1.4%	2.5%	4.5%	7.5%
3 year	2.7%	3.3%	4.2%	7.5%	13.5%	22.5%
5 year	4.5%	5.5%	7.0%	12.5%	22.5%	37.5%
7 year	5.5%	6.7%	8.4%	15.5%	27.5%	45.9%
10 year	7.0%	8.5%	10.5%	20.0%	35.0%	58.5%
15 year	9.7%	10.9%	13.0%	25.0%	44.0%	61.0%



SCR – Market risk – Aggregation / Diversification

SCR$_{market}$

SCR_{mkt} = Mkt Calculation

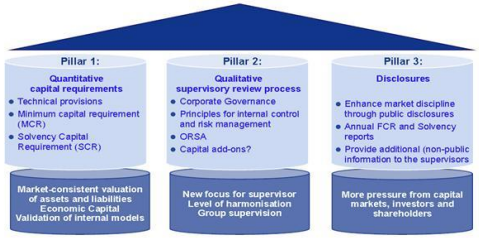
$$SCR_{mkt} = \sqrt{\sum_{r\,xc} CorrMkt^{r\,xc} \bullet Mkt_r \bullet Mkt_c}$$

Six sub-modules for SCR_{Mkt}

1) Mkt_{int} = interest rate risk
2) Mkt_{eq} = equity risk
3) Mkt_{prop} = property risk
4) Mkt_{sp} = spread risk
5) Mkt_{fx} = currency risk
6) Mkt_{conc} = market concentration risk

CorrMktUp	Mkt_{int}	Mkt_{eq}	Mkt_{prop}	Mkt_{sp}	Mkt_{fx}	Mkt_{conc}
Mkt_{int}	1					
Mkt_{eq}	A	1				
Mkt_{prop}	A	0.75	1			
Mkt_{sp}	A	0.75	0.5	1		
Mkt_{fx}	0.25	0.25	0.25	0.25	1	
Mkt_{conc}	0	0	0	0	0	1

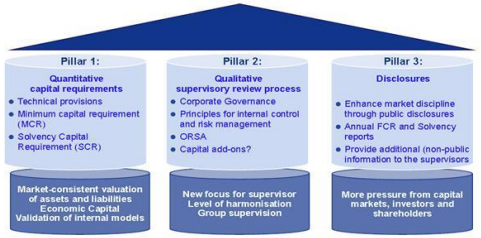
A = **0** in interest rate up scenario, **0.5** in interest rate down scenario



SCR – Market risk – Conclusions

SCR_{mkt} = Mkt Calculation

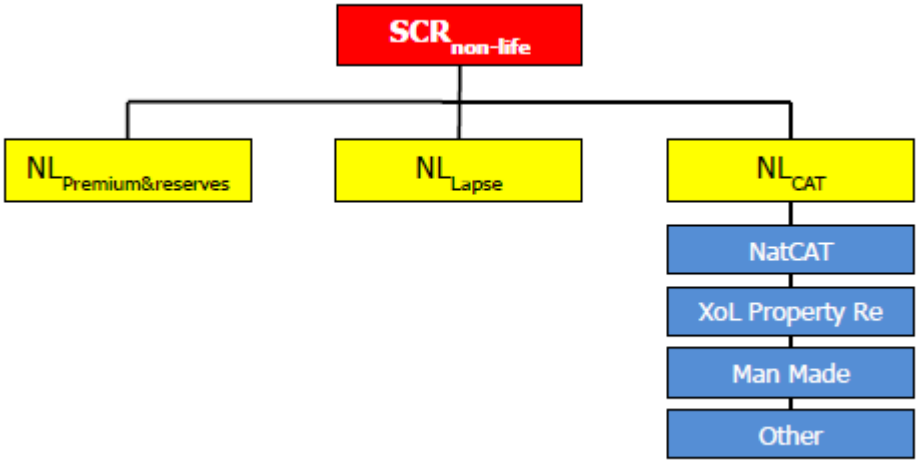
- close ALM gaps
- Equity : very costly
- Property : not well treated
- Corporate Bond : Fair
- Govies : No SCR charge but returns ???

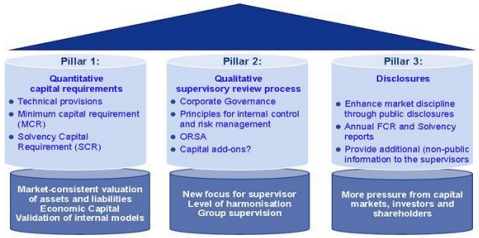


SCR – Non-Life risk

$SCR_{non\text{-}life}$

Non-Life Underwriting Risk Module





SCR – Non-Life risk – Premium / Reserve Risk

NL_{pr} = premium & reserve risk

$$NL_{pr} = 3 * \sigma * V$$

σ : Standard Deviation = risk mesure

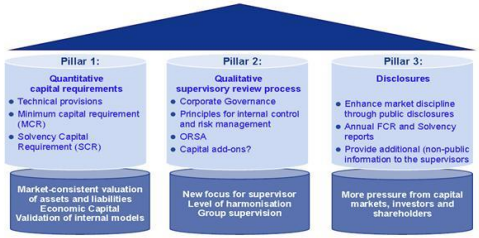
V : aggregated Volume of Premiums and Reserves

LoB	*SD for premium risk (gross)*
Motor vehicle liability	10%· NP_{lob}
Other motor	8%· NP_{lob}
MAT	15%· NP_{lob}
Fire	8%· NP_{lob}
3rd-party liability	14%· NP_{lob}
Credit	12%· NP_{lob}
Legal expenses	7%· NP_{lob}
Assistance	9%· NP_{lob}
Miscellaneous	13%· NP_{lob}
NP reins (prop)	17%
NP reins (casualty)	17%
NP reins (MAT)	17%

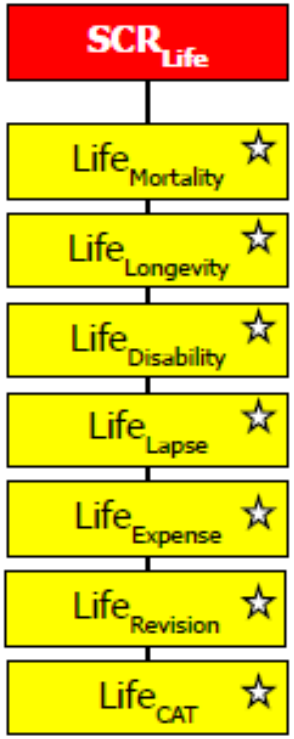
Standard derivation for (net) reserve risk, as per table:

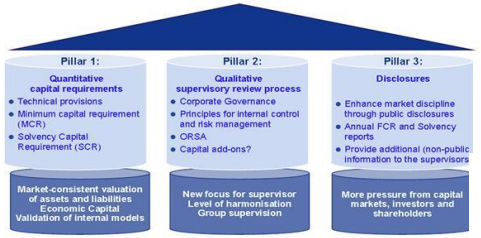
LOB		$\sigma_{(res,lob)}$
1	Motor, third-party liability	9%
2	Motor, other classes	8%
3	Marine, aviation, transport (MAT	11%
4	Fire and other property damage	10%
5	Third-party liability	11%
6	Credit and suretyship	19%
7	Legal expenses	12%
8	Assistance	20%
9	Miscellaneous	20%
10	Non-prop reinsurance – property	20%
11	Non-prop reinsurance – casualty	20%
12	Non-prop reinsurance – MAT	20%

Reinsurance is fully taken into account…

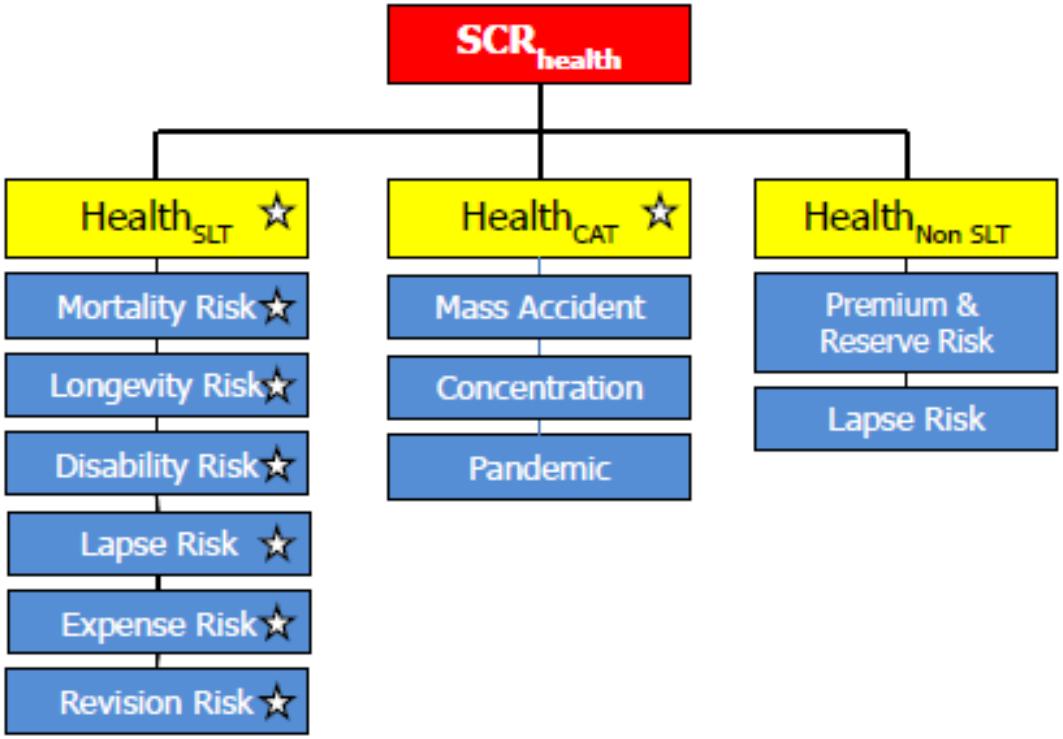


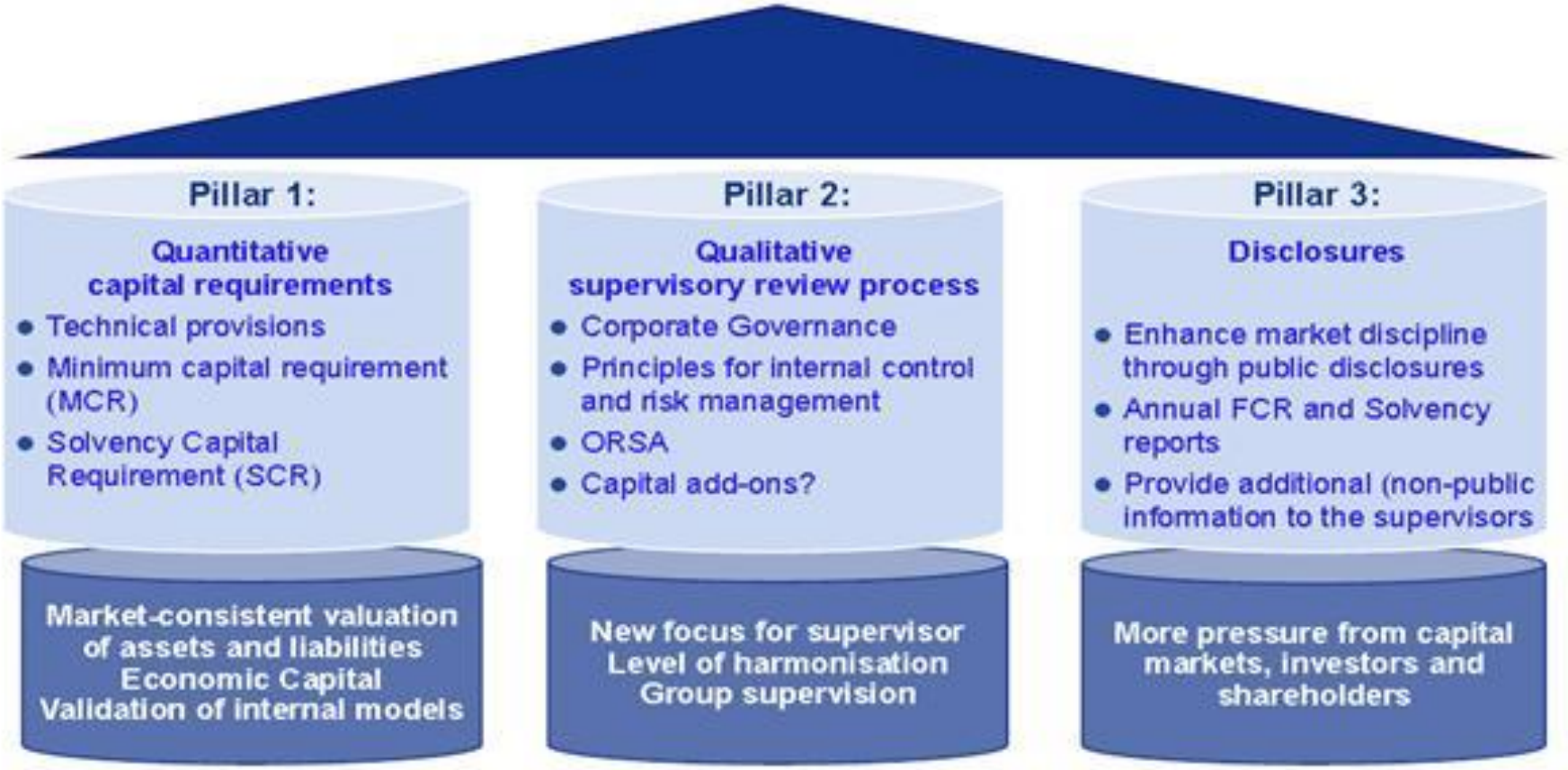
SCR – Life





SCR – Health



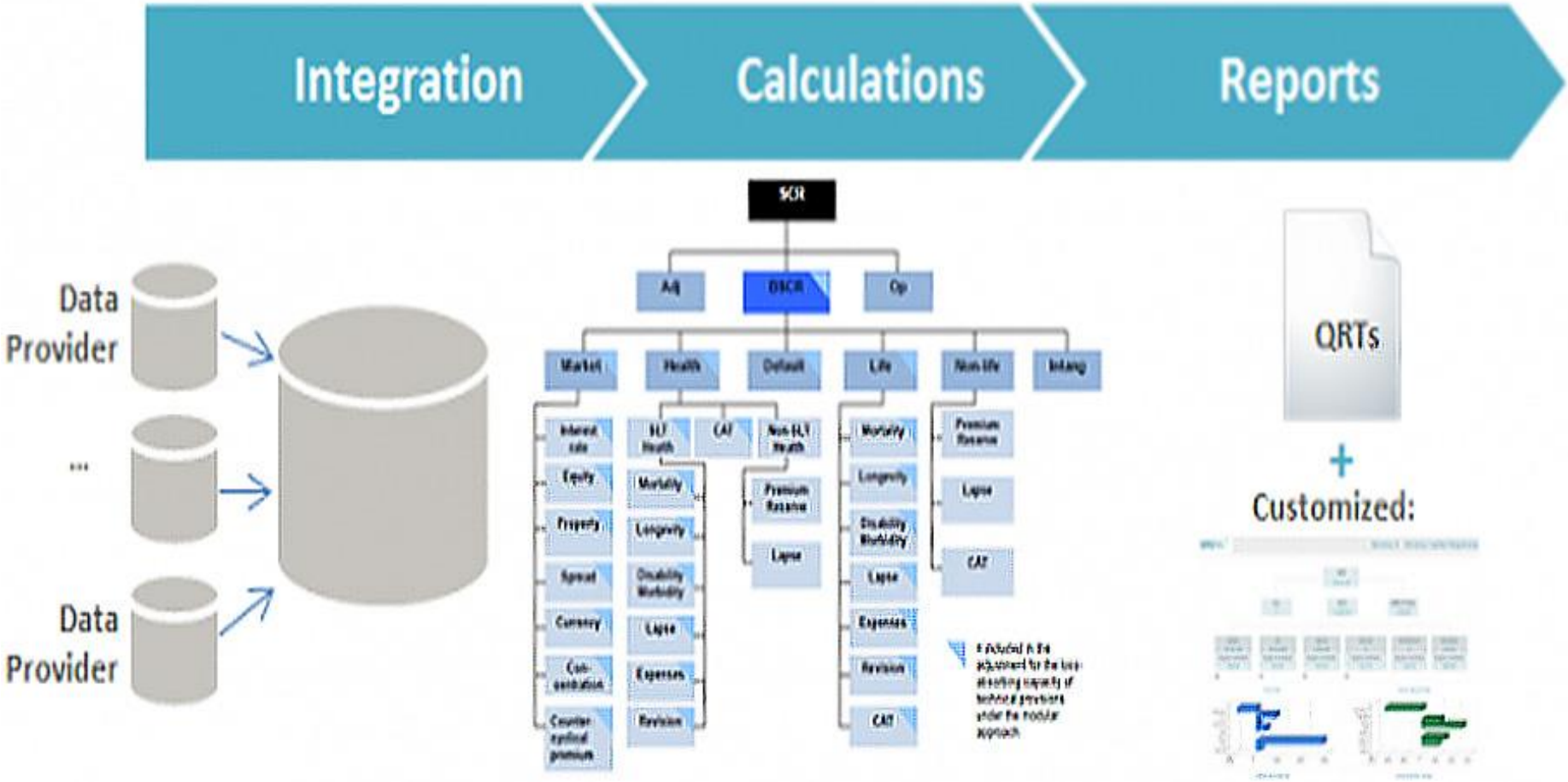


The Board :

Fit & Proper
Responsable
…

4 Control Functions:

- Risk Management
- Compliance
- Audit
- Actuarial Function



Welcome in the Solvency II world ….