Solvency Assessment and Management:

Steering Committee

Position Paper 89[1] (v 3)

Calculation of SCR on total balance sheet

EXECUTIVE SUMMARY

Solvency II, and the specifications for the SAM QIS 1, 2 and 3 exercises, require that the SCR is calculated by re-calculating the total statutory balance sheet as opposed to an approach where only those assets required to back the liabilities plus the capital requirement are stressed. The latter is the approach currently used for life companies under SAP104. There are advantages and disadvantages to both approaches – this discussion documents sets these out for consideration.

The recommendation is that the total statutory balance sheet should be included for the purposes of calculating an SCR, but that when following this approach the capital cover ratio allows for a better comparison than the SCR numbers themselves.

1. INTRODUCTION AND PURPOSE

This document sets out the recommendations of the SCR Structure working group with respect to the assets to be included in the calculation of the SCR. The theoretical basis for the discussion is whether it is appropriate to use a value at risk calculation to arrive at a metric that will be used for the purposes of assessing solvency. By definition a value at risk approach will include all items which are assigned value on an economic balance sheet. This will include assets over and above those required to meet technical provisions and could be divided into assets meeting the capital requirement and those that act as additional cover (free surplus) over and above the requirement.

An issue has been raised whether this free surplus should be included when calculating a capital charge or in other words, whether a capital charge should be held against free surplus.

2. INTERNATIONAL STANDARDS: IAIS ICPs

ICP 17 (Capital adequacy), sections 17.1 and 17.10 (as adopted in October 2010 and again as part of the revised ICP in October 2011) are relevant.

17.1

[1] Position Paper 89 (v 3) was approved as a FINAL Position Paper by Steering Committee on 12 September 2014.

"The supervisor requires that a total balance sheet approach is used in the assessment of solvency to recognise the interdependence between assets, liabilities, regulatory capital requirements and capital resources and to require that risks are appropriately recognised."

Section 17.1.1. goes on to explain that this principle speaks to consistency of how risks are measured on all the components of the balance sheet and that the term "total balance sheet" refers to "*the recognition of the interdependence between assets, liabilities, regulatory capital requirements and capital resources*." It is specifically noted that this approach should be viewed as a concept and should not imply the use of a specific methodology.

17.10

"The supervisor defines the approach to determining the capital resources eligible to meet regulatory capital requirements and their value, consistent with a total balance sheet approach for solvency assessment and having regard to the quality and suitability of capital elements."

Where sections 17.10.1 – 17.10.4 & 17.10.6 speak to consistency and inter-relationships, 17.10.5 expands on the purpose of regulatory capital requirements:

"… (to ensure that) in adversity, an insurer's obligations to policyholders will continue to be met as they fall due. This aim will be achieved if technical provisions and other liabilities are expected to remain covered by assets over a defined period, to a specified level of safety."

3. EU DIRECTIVE ON SOLVENCY II: PRINCIPLES (LEVEL 1)

Article 101 (3): Calculation of the Solvency Capital Requirement

"*… It shall correspond to the Value-at-Risk of the* ***basic own funds*** *of an insurance or reinsurance undertaking subject to a confidence level of 99,5 % over a one-year period.* "

Article 88: Basic Own Funds

"Basic own funds shall consist of the following items:
(1) the ***excess of assets over liabilities****, valued in accordance with Article 75 and Section 2;*
(2) subordinated liabilities.

The excess amount referred to in point (1) shall be reduced by the amount of own shares held by the insurance or reinsurance undertaking."

4. MAPPING ANY PRINCIPLE (LEVEL 1) DIFFERENCES BETWEEN IAIS ICP & EU DIRECTIVE

There are no principle differences between IAIS ICP & the EU directive. The EU directive specifically mentions a value-at-risk calculation on basic own funds and goes on to define basic own funds. The EU directive can be viewed as a specific interpretation of the more generalised ICP.

Where the EU directive has interpreted the stress to be applied to the total assets, the definition of a regulatory capital requirement, set out in ICP 17.10.5 is exceeded as the extent to which "*technical provisions and other liabilities are expected to remain covered by assets over a defined period"* will be to a higher specified level of safety than 99.5% where companies have invested assets backing free surplus in risky assets. This is explained in more detail in section 6, but can be summarised by mentioning that the SCR also includes an allowance for the riskiness of assets over and above those required to cover "technical provisions and other liabilities" in adverse scenarios.

5. STANDARDS AND GUIDANCE (LEVELS 2 & 3)

5.1 IAIS standards and guidance papers

No level 2 or 3 guidance papers on this topic on IAIS site - level 1 principles from ICP17 included in section 2. An issues paper titled *On Solvency, Solvency Assessments and Actuarial Issues* dated 15 March 2000 was considered. This paper did not consider the specific issue, but general issues around aims of solvency requirements and the consideration of minimum solvency requirements were taken into account in the discussions.

5.2 CEIOPS CPs (consultation papers)

- The following extracts are from CP78 (3rd country equivalence) par. 2.3.51
  "The requirement should enable the undertaking at a minimum to withstand a 1 in 200 ruin scenario over a one year period or ensure that policyholders and beneficiaries receive at least the same level of protection"

5.3 Other relevant jurisdictions

APRA: LPS 2.04 (November 2007)

The capital requirements for market and other risks are calculated sequentially. That is, initially a capital requirement is calculated for all risks that are not related to any asset movement. Following that, a further calculation is performed where both the basic liability and the first stage of this capital requirement calculation are taken into account. Some assumptions need to be made around what portion of excess assets (and hence the nature) back this first stage of the requirement. (It is assumed that the nature of the assets backing the liabilities is known in this case.)
A stress to the market value of these assets is then calculated (the *resilience* reserve) and added to the first stage of the requirement. This approach would not stress all the assets on the balance sheet and performing calculations sequentially sidesteps some of the hypothecation issues. It does not allow for diversification between market risks and other risks, but does allow for diversification within market risks. This feature is explicitly noted in section 11.1:
The Resilience Reserve is determined as the additional amount that needs to be held before the happening of a prescribed set of changes in the economic environment, such that after the changes the admissible assets of the company are able to meet the policy owner and other liabilities of the statutory fund, including the assessed liability risks…

OSFI: MCCSR (December 2010)

All assets are considered in calculating the part of the formula relating to market risks. These regulations explicitly include contingent liabilities from off-balance sheet entities or activities.

INSPRU and SAP104 (current UK pillar 1 and SA capital requirement):

Under both INSPRU and SAP104, assets are hypothecated to arrive at an assumed asset allocation backing capital. As such, no capital charge is held against free surplus.

6. ASSESSMENT OF AVAILABLE APPROACHES GIVEN THE SOUTH AFRICAN CONTEXT

6.1 Discussion of inherent advantages and disadvantages of each approach

The paragraphs below are preceded by "For" or "Against" depending on whether they argue in favour of holding a capital charge in respect of free surplus, or not. Some of the paragraphs refer to sample calculations included in Appendix A.

6.1.1 For: By stressing the entire balance sheet, the complexity of allocating excess assets to those backing required capital and free surplus is removed. If companies do not stress the free surplus, but instead hypothecate which assets are backing the capital requirements, two identical companies could end up having different SCRs based on what is assumed for hypothecation. Similarly, a company would be able to change its own assumptions around hypothecation from one period to the next.

6.1.2 Against: The issue of whether the stressing of the entire balance sheet is appropriate was first raised in the context that it results in those with higher excess assets having higher capital requirements (due to the additional market risk). Intuitively, this seems unfair, as for two companies with identical liabilities and assets, apart from having different levels of excess assets, the one with lower excess assets should be more exposed to risk and therefore require more capital. This is illustrated by comparing Companies A and C in Appendix A (where the total balance sheet is stressed).

6.1.3 For: A counter-argument to this is that for two otherwise identical companies, one with excess assets held in cash and the other in equities, the second must be more exposed to risk. This is only captured in the capital requirement if the full balance sheet is stressed. This is illustrated by comparing Companies B and C (where the total balance sheet is stressed).

6.1.4 For: The possibility exists that excess assets are invested in highly geared instruments or those that could give rise to a liability, and that volatility in these assets could reduce the excess assets to less than zero. By not stressing the total balance sheet, these effects will not be captured. This may lead to a loss of confidence in the industry's capital requirements (SCR) as there are likely to be a number of stakeholders to whom it would not be evident why a well-capitalised company should fail.

6.1.5 Against: There is a concern that if companies are "penalised" for holding excess assets, they will be incentivised to return these assets to shareholders as rapidly as possible, which would not be in the best interests of policyholders (as a higher "buffer" of excess assets will provide greater policyholder security).

6.1.6 For: The above point is countered by demonstrating that the inability to meet liabilities is not just a function of the SCR cover, but by the risk associated with the assets backing the free surplus – illustrated by Company C (where the total balance sheet is not stressed).

6.1.7 Against*:* When comparing companies, it will be difficult to compare SCRs as well as ratios containing SCRs e.g. SCR as a percentage of liabilities.

6.1.8 For: The examples in appendix A illustrate the comparative power of the SCR cover ratio. The key issue here is that also though the absolute level of SCR will rise as excess assets increase, the SCR Cover will also increase, and comparability is thus maintained.

6.1.9 Against: Another way in which the issue has been framed is that stressing the full balance sheet will give an **economic** capital requirement, which is not necessarily the same as a **regulatory** capital requirement. If an insurer has sufficient assets to covers its liabilities with 99.5% probability, the regulator should not be require it to hold a charge against assets in excess of this level. This is illustrated by the example where Company C has its total balance sheet stressed, producing a SCR which is higher than the capital required for it to meet its obligations in 99.5% of scenarios.

6.2 Impact of the approaches on EU 3rd country equivalence

Stressing only the assets required to back technical provisions and SCR would be a departure from Solvency II. It is not clear whether this would impact third country equivalence.

6.3 Comparison of the approaches with the prevailing legislative framework

Under the prevailing legislative framework for life (re)insurers, only the assets required to back the liabilities and the Capital Adequacy Requirement are stressed when calculating the capital required.

Until recently, under the prevailing legislative framework for non-life insurers, capital was not calculated using a risk-based approach. The interim requirements introduced by Board Notice 169 of 2011 take underwriting, market, credit and operational risks into account. Market and credit risk capital is only required for assets backing liabilities, and not for assets backing the Capital Requirement or free surplus.

6.4 Conclusions on preferred approach

By only stressing the assets required to back liabilities and the capital required to ensure that a company remains solvent in 99.5% of scenarios, the SCR will always

produce the exact requirement so as to ensure that a company is sufficiently capitalised for these scenarios.

By stressing the total assets, the SCR will only produce the exact capital required if a company does not hold any free surplus. These points are illustrated by the calculations performed for Company A and C. The extent to which it will not produce the exact requirement is driven to the extent that a charge is held against assets backing free surplus, i.e. the riskier the assets, the greater the deviation.

One would not expect this deviation to have a detrimental effect on reported capital requirements.

Given this, the comparative advantages of stressing all assets outweigh the remaining concerns relating to the comparative ability of the SCR. This concern can be addressed by positioning the SCR cover as the key comparative ratio.

A proposal has been made to define a measure (tentatively called the MSCR or Minimum SCR – **not** the same as the MCR) which is calculated as the SCR assuming that Own Funds = SCR (or alternatively, the SCR if all excess assets are invested in credit-risk-free cash). This would be a more comparative measure of risk between insurers when viewed in isolation, but less so when calculating the SCR cover. The maximum permissible dividend would then be easily calculated as (Own Funds less MSCR), whereas deriving the maximum dividend from the SCR would be an iterative process. Arguments against this are the additional complexity of calculating a second value that may not be materially different from the first. In addition, the calculation itself will be iterative in nature (due to the hypothecation involved) so does not expedite the production of the above information.

It is envisaged that insurers may opt to include calculations similar to the minimum SCR (among others) for self-assessment and capital management purposes, but it continues to be outside of the scope of SCR calculations.

The SCR should be based on the value-at-risk of the net asset value, where assets are defined as the total assets reflected on the statutory balance sheet. The net asset value should correspond to the basic own funds.

7. RECOMMENDATION

The recommendation to include all assets that are admissible on the statutory balance sheet when calculating shocks to asset values is primarily justified by it meeting the following criteria:

(a) For otherwise identical insurers, the insurer with the higher level of free surplus will have a higher level of excess assets, unless the free surplus is invested in an extremely risky geared portfolio.
(b) Policyholder security as measured by the SCR cover ratio will still be an increasing function of free surplus for the majority of investment options available. Only a geared risky asset allocation will result in a company with a larger free surplus having a lower SCR cover ratio than an otherwise identical insurer.
(c) The SCR will be an increasing function of the riskiness of the investment mandate applied to excess assets.
(d) The SCR will cover all of the potential asset impacts on the balance sheet.
(e) The need to introduce assumptions around hypothecating assets is removed and hence makes results more comparable between companies and time periods.

Appendix A

(from note sent to Pillar 1 steering committee – August 2011)

This note uses simple examples to illustrate the information content of the SCR Cover for a number of different scenarios. The examples also use the instantaneous shock approach as used in Solvency II, which has its own technical drawbacks not discussed here. In all of the examples, the liabilities are assumed to be a fixed outflow immediately after the instantaneous shock.

Asset returns

Only two asset classes are considered, namely cash and equity. The mean returns are assumed to be zero, given that an instantaneous shock is assumed. A normal distribution is assumed for equity returns. The following table shows the return distributions:

	Mean	Std Dev	Percentiles				
			0.241%	0.359%	0.50%	10%	50%
Equity return	0%	20%	-56.36%	-53.76%	-51.52%	-25.63%	0.00%
Cash return	0%	0%	0.00%	0.00%	0.00%	0.00%	0.00%

The following table shows the excess above mean returns as a multiple of the standard deviation. These multiples will later be used to assess relative strength of different SCR Covers.

Equity return - excess above mean	-56.36%	-53.76%	-51.52%	-25.63%	0.00%
(A) Multiple of Std Dev	-2.82	-2.69	-2.58	-1.28	-0.00
SCR Cover (A / -2.58)	1.09	1.04	1.00	0.50	0.00

Company A

Consider Company A that has all of its assets, including own funds, invested in equities and which has a SCR Cover of 1. The following table sets out the SCR calculation and distribution of the Surplus:

Assets - current :	206.3	
Liabilities - current:	100.0	
Own Funds (OF) :	106.3	
SCR:	106.3	
- Delta Assets	106.3	= - 206.3 x - 51.52%
+Delta Liabilities	-	
SCR Cover (OF / SCR)	1.00	

	Percentiles				
	0.241%	0.359%	0.50%	10%	50%
Assets after shock:	90.0	95.4	100.0	153.4	206.3
Liabilities after shock:	100.0	100.0	100.0	100.0	100.0
Surplus after shock:	-10.0	-4.6	0.0	53.4	106.3

Company A has no free surplus. It has a probability of default of 99.5% and its SCR equals the capital required to meet its obligations in 99.5% of scenarios.

Company B

Consider Company B, which is similar to Company A except that it has free surplus of 10 which is invested in cash.

Assets - current:	216.3
Base Assets : Equity	206.3
Additional Assets : Cash	10.0
Liabilities current:	100.0
Own Funds (OF) :	116.3
SCR:	106.3
- Delta Base Assets	106.3
- Delta Additional Assets	-
+ Delta Liabilities	-
SCR Cover	1.09
A = Multiple of StDev (0.5%)	2.58
B = SCR Cover x A =	2.82
Probability (B) of default =	0.241%

= - 206.3 x - 51.52%

	Percentiles				
	0.241%	0.359%	0.50%	10%	50%
Base Assets : Equity	90.00	95.38	100.00	153.39	206.26
Additional Assets : Cash	10.00	10.00	10.00	10.00	10.00
Assets after shock:	100.00	105.38	110.00	163.39	216.26
Liabilities after shock:	100.00	100.00	100.00	100.00	100.00
Surplus after shock:	0.00	5.38	10.00	63.39	116.26

As shown above, the probability of default could be derived from the SCR cover using the normal distribution. Although, this will not be accurate in practice, it illustrates the use of SCR cover as a relative measure. Company B has a probability of default of 0.241%. Its SCR equals the capital required to meet its obligations in 99.5% of scenarios.

Company C – Stressing Entire Balance Sheet

Now consider Company C, which is similar to Company B except that the excess capital is invested in equities. Also assume that the SCR is calculated by stressing the entire balance sheet, including free surplus, as is done in Solvency II.

Assets - current:	216.3	
Base Assets : Equity	206.3	
Additional Assets : Equity	10.0	
Liabilities current:	100.0	
Own Funds (OF) :	116.3	
SCR:	111.4	
- Delta Base Assets	106.3	= - 206.3 x - 51.52%
- Delta Additional Assets	5.2	= - 10.0 x - 51.52%
+ Delta Liabilities	-	
SCR Cover	1.04	
A = Multiple of StDev (0.5%)	2.58	
B = SCR Cover x A =	2.69	
Probability (B) of default =	0.359%	

	Percentiles				
	0.241%	0.359%	0.50%	10.00%	50.00%
Base Assets : Equity	90.00	95.38	100.00	153.39	206.26
Additional Assets : Equity	4.36	4.62	4.85	7.44	10.00
Assets after shock:	94.36	100.00	104.85	160.83	216.26
Liabilities after shock:	100.00	100.00	100.00	100.00	100.00
Surplus after shock:	-5.64	0.00	4.85	60.83	116.26

Company B has a probability of default of 0.359%, lower than the 0.241% had its free surplus been invested in cash. Its SCR is higher than the capital required to meet its obligations in 99.5% of scenarios.

Company C – without stressing excess capital

The following example does not stress the additional / excess capital:

Assets - current:	216.3	
Base Assets : Equity	206.3	
Additional Assets : Equity	10.0	
Liabilities current:	100.0	
Own Funds (OF) :	116.3	
SCR:	106.3	
- Delta Base Assets	106.3	= - 206.3 x - 51.52%
- Delta Additional Assets	-	
+ Delta Liabilities	-	
SCR Cover	1.09	
A = Multiple of StDev (0.5%)	2.58	
B = SCR Cover x A =	2.82	
Probability (B) of default =	0.241%	

	Percentiles				
	0.241%	0.359%	0.50%	10.00%	50.00%
Base Assets : Equity	90.00	95.38	100.00	153.39	206.26
Additional Assets : Equity	4.36	4.62	4.85	7.44	10.00
Assets after shock:	94.36	100.00	104.85	160.83	216.26
Liabilities after shock:	100.00	100.00	100.00	100.00	100.00
Surplus after shock:	-5.64	0.00	4.85	60.83	116.26

The SCR cover under-estimates the probability of default or relative financial strength. The SCR equals the capital required to meet its obligations in 99.5% of scenarios.