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MALTA FINANCIAL SERVICES AUTHORITY

in consultation with :

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COMMISSARIAT AUX ASSURANCES

Solvency II – QIS4

Additional national guidance to the technical specifications for Captive Insurance and Reinsurance Undertakings

1. Background

In the light of the Solvency II project, the European Commission asked CEIOPS to conduct a range of Quantitative Impact Studies (QIS). These studies basically aim to test the underlying assumptions to the so called standard model. The QIS are conducted in such a way that the degree of granularity and scope increase gradually:

- QIS1 tested the valuation of technical provisions at market value;
- QIS2 = QIS1 + introduction of the standard formula of the Solvency Capital Requirement (SCR) and the Minimum Capital Requirement (MCR);
- QIS3 = QIS2 + calibration of the SCR and the MCR + guidelines on own funds + treatment of insurance groups.

In QIS4, particular attention will be put on

- identification and classification of own funds in one of the 3 Tiers ;
- again treatment of group aspects, since group participation in QIS3 was moderate;
- introduction of a questionnaire on internal models and operational risk.

Since the technical specifications (TS) in QIS4 are voluntary designed in a broad way in order to generate a large participation quota, it is obvious that these TS do not suit perfectly all market participants in the 27 EU Member states.

Captives are one group of these participants for whom the TS do not take into account their particularities, which are for some parts of the TS quite different from the ones of the standard insurance company. Thus Member states have been encouraged by the European Commission to issue additional guidance better reflecting the specificities of their markets and industries. The present paper, a common proposal by Luxembourg, Ireland and Malta, provides for national guidance to address the particularities of the European captive industry.

In order to highlight the particularities applicable to captives, their supervisory authority needs to collect data on a number of simplifications/ alternatives suggested below. Therefore, captives are encouraged, **in addition** to the guidelines foreseen in the TS as published by the Commission and Ceiops, to test the following simplifications/ alternatives.

Providing the **two** sets of data (implementation of the TS as published by Ceiops, and the simplifications/alternatives proposed later in this document) will allow to give to the Commission Services realistic evidence of the impact of the current TS on the financial situation of the captives, as well as for the need for a simplifications/ alternatives.

The results of the simplifications/ alternatives should be submitted to the supervisor on a separate version of the official QIS4 spreadsheet published on 6/5/2008, and/or in a written document stating the results to the module on which the simplification/ alternative has been applied. The deadline for submitting the documents to the supervisory authority for solo companies is 7th of July 2008, and the 31st of July 2008 for group results. It is extremely important that the qualitative questionnaire is submitted together with the quantitative results, in order to have a feedback on participants' problems/suggestions.

The gathering of this additional set of data should not be interpreted as implying that a differentiated regime will be introduced.

This note follows the numbering of the official QIS4 TS - document available on http://www.ceiops.eu/content/view/118/124.

2. Additional national guidance to the technical specifications

TS.B.29 - Recoverables from reinsurance contracts and SPV's

<u>Reason for the proposal of the additional test</u>: very often, captives are unrated.

Insurance captives ceding business to a reinsurance captive should evaluate the effect of applying the guidelines foreseen in TS.II.B.29 and additionally test the effect of using the rating of the group to whom the reinsurance captive belongs.

Reinsurance captives should evaluate the effect of applying the guidelines foreseen in TS.II.B.29 on the insurers/reinsurers ceding business to them, or group transactions involving captives and, as far as recoverables towards a captive are concerned, *additionally* test the effect of using the rating of the group to whom the captive belongs.

TS.IX.B.9 - Simplification for market interest rate risk

<u>Reason for proposing an alternative/ simplification:</u> instead of investigating maturities and/or durations of every asset and every liability line by line, assets are grouped by maturity-intervals and best estimates of technical liabilities are evaluated along the lines of the proxy developed in TS.IV.I.6. with the discounting factors as proposed hereafter taking into account of the risk free term structure as of 31.12.2007.

In TS.IX.B.5, QIS4 foresees different interest rate shocks (upwards and downwards) for individual maturities on assets as well as on liabilities. To simplify, these shocks have been translated into a percentage to be deducted from the market value of the assets, and a percentage to be deducted from the undiscounted best estimate of the technical provisions.

I.   *Alternative scenario nr 1 to be tested by captives:*

Shocks on market asset values:

- Maturity less than 1 year: -2% / +1%
- Maturity between 1 and 3 years: -6% / +4%
- Maturity between 3 and 5 years: -10% / +7%
- Maturity above 5 years: -13% / +11%
- Eventually maturity above 10 years: -17% / +16%

Shocks on best estimate of technical provision, considering the durations in TS.IV.I.6 and shocks in TS.IX.B5:

LOB	based on Durmod	Discounting factor	Discounting factor up	Discounting factor down
Accident and health	1,8	7,66%	12,95%	4,18%
Motor, third party liability	5,8	22,87%	32,32%	14,99%
Motor, other classes	0,8	3,60%	6,74%	1,80%
Fire and other damage to property	1,1	4,92%	9,15%	2,47%
Third-party liability (private)	2	8,47%	14,28%	4,63%
Third-party liability (other)	5	19,96%	29,04%	12,61%
Marine, aviation and transport	1,5	6,42%	10,92%	3,49%
Credit and suretyship	2	8,47%	14,28%	4,63%
Legal expenses	2,5	10,44%	16,78%	6,05%
Assistance	0,7	3,16%	5,92%	1,58%
Miscellaneous non-life insurance	1,7	7,25%	12,28%	3,95%

Participants are asked to indicate if the durations per LoB as taken over from the German market specified in TS.IV.I.6, are accurate for their own situation and if not, to indicate what the correct duration per LoB should be, based on their own experience.

The column 'Discounting factor' states by line of business (LOB) the percentage to be deducted from the *undiscounted* best estimate of technical provisions, in order to derive the *discounted* best estimate of technical provisions.

The percentages in the column 'Discounting factor Up' are to be deducted from the *undiscounted* best estimate in order to derive the *upward-shocked, discounted* best estimate.

Similarly, the percentages in the column 'Discounting factor Down' are to be deducted from the *undiscounted* best estimate in order to derive the *downward-shocked, discounted* best estimate.

II.   *Alternative scenario nr 2 to be tested by captives:*

Captives should also test the following conservative approach. The market interest rate charge can be obtained by applying the upward shock scenario on assets only, without taking into account the downward shocks (as the value of the assets increases under such a scenario) and

without 'netting' the impact on assets by the corresponding impact on liabilities. Market interest rate risk is thus reduced to the following scenario:

Shocks on market asset values:

- Maturity less than 1 year: 1%
- Maturity between 1 and 3 years: 4%
- Maturity between 3 and 5 years: 7%
- Maturity above 5 years: 11%
- Eventually maturity above 10 years: 16%

This is a conservative approach since

- It is based on the fact that the impact on assets will be higher than the impact on liabilities which is the most common case since assets are normally higher than technical provisions;

- Calculating the upward shock on liability would decrease the amount of liability and then increase the NAV. Ignoring the impact on liabilities is a conservative assumption.

TS.IX.E - Currency Risk

Reason for proposing an alternative / a simplification : The proposed TS for currency risk are not in line with common practice in captive business. Captives typically book their technical provisions in the currency of the reinsurance contracts.

Captives should also test the following alternative: On technical liabilities, should be retained only the currencies in which the technical provisions are kept, or if not defined, the currency in which the policy has been established. This is in line with common practice by which captives typically use the policy currency and post their liabilities in that currency.

TS.IX.F - Market Spread Risk

Captives should test the proposed scenario indicated in TS.IX.F, and, additionally, the following simplification:

Captives should consider their whole non-government bond portfolio and then apply the following factors on the total asset market value depending on the maturity bonds assuming that the stressed assets are all BBB rated):

- Maturity less than a year: 1,3%
- Maturity between 1 and 3 years: 2,3%
- Maturity between 3 and 5 years: 4,5%
- Maturity between 5 and 10 years: 7,3%
- Maturity above 10 years: 11,2%

TS.IX.G - Market concentration risk

Due to their size and business model, it is highly inefficient for captives to spread their assets on numerous banks or issuers. Indeed captives are usually part of the banking arrangements of their parent group who tend to centralize all funds with a limited number of banks. Therefore, the following alternative for captives should be tested, in addition to the guidelines foreseen in the market concentration risk module foreseen in the TS:

Captives may be exempted from the application of the market concentration risk module on assets provided that they use custodians or issuers that are at least A rated or equivalent.

TS.X.A.11 - SCR counterparty risk module

<u>Reason for proposing an alternative / a simplification:</u> Applying a flat rating of BBB to unrated captives subject to Solvency II is not a risk-based approach.

The following two alternative scenarios should be tested by captives:

I.   Alternative scenario nr 1 to be tested by captives:

Unrated captives would be treated according to the rating class of the group to whom the captive belongs. In case the group is not rated and the captive is subject to Solvency II regulation, the captive would be treated as rating class 3 (BBB).

II.   Alternative scenario nr 2 to be tested by captives:

For unrated captives subject to Solvency II regulation the probability of default of the captive will be determined according to a regulatory rating depending on the solvency ratio (as at 31.12.2007 calculated according either to QIS4 or to the provisions of the Reinsurance Directive 2005/68 when the former is not available) as follows:

Solvency ratio	PD*
>200%	0.002%
>160%	0.010%
>130%	0.050%
>100%	0.240%
>70%	1.200%
>50%	6.400%
<=50%	30.410%

* where PD = probability of default.

TS.XI - Life underwriting risk module

At this stage, it was not considered that alternatives / simplifications are required for captives on the life underwriting risk module. Captives underwriting life risks are however encouraged to participate and to submit any comment / proposal they consider appropriate.

TS.XII - Health underwriting risk module

At this stage, it was not considered that alternatives / simplifications are required for captives on the health underwriting risk module. Captives underwriting health risks are however encouraged to participate and to submit any comment / proposal they consider appropriate.

TS.XIII.B.18 - Non life underwriting risk module

Reason for proposing an alternative / a simplification: The proposed formula in TS.XIII.B.18, whilst fully correct for reserve risk, does not take into account the fact that captives typically have a combined ratio lower than 100% and very often have an annual aggregate limit in the contract. This section is divided into a first more theoretical part, followed by concrete application guidelines. Participants are welcome to read through the theoretical part, but it is not mandatory.

I. *Theoretical part*

Specific comment on the level of the combined ratio

For premium risk, taking into account the actual historical combined ratio of a reinsurance captive instead of assuming a combined ratio of 100%, the formula TS.XIII.B18 would become :

$$\rho(\sigma) = \exp\left[2\ln(\mu) - 0.5\ln(\mu^2 + \sigma^2) + N_{0.995}\sqrt{\ln(\mu^2 + \sigma^2) - 2\ln(\mu)}\right] - \mu \qquad (1)$$

This generalized formula can then be used also on reserving risk if:

- For reserving risk: $\mu_{res} = 100\%$;
- For premium risk: μ_{prem} equals the average historical combined ratio calculated consistently with n_{lob} as defined in TS.XIII.B.15, or the expected combined ratio estimated with standard actuarial methods;

Specific comment on diversification of underwriting years

The current formula for reserve risk in TS.XIII.B considers a standard deviation per LoB and applies it to the full amount of net provision for claims outstanding ($V_{res,lob}$) which implicitly assumes a full correlation between all historical underwriting years ($UY_{res,lob}$) for which provisions are still open. In practice however, considering the characteristics of low frequency, medium/high severity of a typical reinsurance captive portfolio, there is some diversification effect between the underwriting years because they would not normally all deteriorate at the same time.

With the current approach, if $V_{res,lob}$ is mostly concentrated on one single underwriting year (eg because of one single major product liability claim) or spread across many historical underwriting years (eg on a stable portfolio of high frequency / low severity automobile claims), the capital charge would be the same while the inherent risk is quite different.

Therefore one should (additionally to the guidelines foreseen in the TS) also consider in the calculation of the overall standard deviation on the reserve risk ($\sigma_{res,lob}$) the split of $V_{res,lob}$ over

historical years as well as a correlation matrix between UY ($CorrUY_{res}$). Then assuming each $V_{res,lob,UY}$ has a standard deviation as defined under TS.XIII.B.25 ($\sigma_{res,lob,UY}$) and combining them using the correlation matrix, one would compute the overall standard deviation applicable to $V_{res,lob}$ using a formula similar to :

$$\sigma_{res,lob} = \sqrt{\frac{1}{V_{res,lob}^2} \bullet \left(\sum_{rxc} CorrUY_{res} \bullet \sigma_{res,lob,r} \bullet \sigma_{res,lob,c} \bullet V_{res,lob,r} \bullet V_{res,lob,c} \right)} \qquad (2)$$

The capital charge for reserve risk would thus be defined as

$$NL_{res,lob} = \rho(\sigma_{res,lob}) \bullet V_{res,lob} \qquad (3)$$

Specific comment on taking into account the annual aggregate limit, or maximum annual loss per LoB

In order to properly take into account the annual aggregate amount or possible/expected maximum annual loss (Agg_{lob}) that may be applicable to underwritten reinsurance contracts, we would recommend to split the calculation of premium risk ($NL_{prem,lob}$) from the calculation of reserve risk ($NL_{res,lob}$) and then compute NL_{pr} by combining the two results using the correlation matrix CorrLob defined in TS.XIII.B.36.

For premium risk, the following formula would then apply :

$$NL_{prem,lob} = Min\left[(Agg_{lob} - V_{prem,lob}); Max\left[\rho(\sigma_{prem,lob}) + \mu_{prem,lob} - 1; 0 \right] \bullet V_{prem,lob} \right] \qquad (4)$$

where Agg_{lob} = annual aggregate limit of the Lob, or possible maximum annual loss on the Lob or expected maximum annual loss at 99.5% confidence level estimated with standard actuarial methods

II.   Concrete application guidelines of the theoretical part

<u>In addition</u> to the SCR non life underwriting risk module as foreseen in the TS, captives should test the following alternative, based on the formulae for $\rho(\sigma)$, premium risk and reserve risk as defined in the TS, as well as considering the market-wide standard deviations shown in TS.XIII.B.25-27, and the matrix CorrLob defined in TS.XIII.B.36.

Assuming

$$\sigma_{res,lob} = \sigma_{prem,lob} = 15\%$$

$$corr_{prem,lob} = corr_{res,lob} = 0,25$$

$$corr_{prem,res} = 0$$

then

$$NL_{prem,lob} = 45\% \bullet V_{prem,lob}$$

$$NL_{pr} = \sqrt{\sum_{lob} NL_{prem,lob}^2 + 50\% \left(\sum_{\substack{r,c \\ r \neq c}} NL_{prem,r} \bullet NL_{prem,c} \right) + [45\%]^2 \left[\sum_{lob} V_{res,lob}^2 + 50\% \left(\sum_{\substack{r,c \\ r \neq c}} V_{res,r} \bullet V_{res,c} \right) \right]}$$

Comment :

Assuming 15% standard deviation for $\sigma_{res,lob}$ and $\sigma_{prem,lob}$ is a conservative assumption, since it is the maximum shown in TS.XIII.B.25 and TS.XIII.B27. The term $corr_{prem,res}$ has been set to 0 considering that there exists no correlation between premium risk and reserve risk. The factors $corr_{prem,lob}$ and $corr_{res,lob}$ represent the correlation factors between Lob's of premium risk and reserve risk. These factors have been set to 0.25 since some correlation exists for premium risk between Lob's and reserve risk between Lob's.

Please note that this alternative formula yields exactly the same result as the NL_{pr} formula defined in TS.XIII.B.17 and following of the TS if we use in these formulae the three assumptions mentioned here above and we don't apply geographical diversification.

Furthermore, taking into account our comments on the combined ratio assumption in formula (1) and on the integration of aggregate limits in premium risk in formula (4), captives should test a generalized version of the above alternative can be generalized by replacing the formulae for $NL_{prem,lob}$ and NL_{pr} by the following :

$$NL_{prem,lob} = Min\left[(Agg_{lob} - V_{prem,lob}); Max[45\% + \mu_{prem,lob} - 1; 0] \bullet V_{prem,lob} \right]$$

To integrate our comment on time diversification of reserve risk in this alternative for captives as shown in formula (2), we propose to simplify by using the number of underwriting years on which the total V_{res} all Lob combined on which outstanding claims are still open (n_{res}) and the maximum amount of total V_{res} concentrated on one single underwriting year ($Max_{res,UY}$). Then by assuming that the underwriting years are independent, the simplified formula to estimate the overall σ_{res} all Lob combined would be :

$$\sigma_{res} = 15\% \times \sqrt{ (Max_{res,UY})^2 + \frac{(1 - Max_{res,UY})^2}{n_{res} - 1} }$$

$$where \ Max_{res,UY} = \frac{Max(V_{res,UY})}{V_{res}}$$

and then the alternative formula for NL_{pr} becomes :

$$NL_{pr} = \sqrt{\sum_{lob} NL_{prem,lob}{}^2 + 50\%\left(\sum_{\substack{r,c \\ r\neq c}} NL_{prem,r} \bullet NL_{prem,c}\right) + \left[3\sigma_{res}\right]^2\left[\sum_{lob} V_{res,lob}{}^2 + 50\%\left(\sum_{\substack{r,c \\ r\neq c}} V_{res,r} \bullet V_{res,c}\right)\right]} \qquad (5)$$

Inventory of data/ figures needed in order to implement the alternative SCR non life underwriting risk module for captives

In order to implement formula (5) to get the capital charge for non-life underwriting risk, the following figures are needed:

1. best estimate for claims outstanding per Lob (appears in V_{res}); proxies stated in TS.IV.B may be used
2. number of underwriting years on which outstanding claims are still open (appears in σ_{res})
3. estimate of net written premium per Lob during the forthcoming year and the previous year (appears in $NL_{prem,lob}$ through $V_{prem,lob}$)
4. estimate of net earned premium per Lob during the forthcoming year (appears in $NL_{prem,lob}$ through $V_{prem,lob}$)
5. historical average combined ratio per Lob, or expected combined ratio estimated with standard actuarial methods
    6. annual aggregate limit per Lob or possible maximum annual loss or expected maximum annual loss at 99.5% confidence level estimated with standard actuarial methods (appears in $NL_{prem,lob}$, through Agg_{lob}).

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