	Comments Template on **Discussion Paper on the review of specific items in the Solvency II Delegated Regulation**		**Deadline** **3 March 2017** **23:59 CET**
Name of Company:	Actuarial Association of Europe (AAE)		
Disclosure of comments:	Please indicate if your comments should be treated as confidential:		Public
	Please follow the following instructions for filling in the template: ⇨ Do **not** change the numbering in the column "reference"; if you change numbering, your comment cannot be processed by our IT tool ⇨ Leave the last column empty. ⇨ Please fill in your comment in the relevant row. If you have no comment on a paragraph or a cell, keep the row empty. ⇨ Our IT tool does not allow processing of comments which do not refer to the specific numbers below. **Please send the completed template, in Word Format, to CP-16-008@eiopa.europa.eu** **Our IT tool does not allow processing of any other formats.** The numbering of the questions refers to the discussion paper on the review of specific items in the Solvency II Delegated Regulation.		
Reference	**Comment**		
General Comment	To achieve conformity with the requirements of the Solvency II Directive for each of the risk sub-modules it is not sufficient to concentrate on the calibration of stress parameters. An indispensable pre-requisite is the sound choice of assumptions and methods used to calculate the best estimate liability. These have to be chosen best estimate. A deviation might lead to an underestimation or overestimation of the capital requirement even if stress calibration is chosen adequately. The assessment of the adequacy of technical provision is not subject to this paper. Several questions asked in the discussion paper can therefore only be answered ceteris paribus -under the assumption that the technical provisions		

are really calculated on a best estimate basis.

1. There is no question regarding expense treatment under mass lapse. If there is a catch-all question, then perhaps we should ask for guidance here to introduce consistency across the EU on this.
2. If you look at the standard formula for Currency and Interest rate risk, it defines the SCR as the change in Own Funds should the shock occur. This, at first glance is logical as it shows how much the value of the Company has changed (the Shareholder Perspective). However, the Standard Formula is not to protect the interests of the shareholder. Its intent is to ensure the policyholder gets paid. As such, it needs to consider how the market event also impacts the risk profile of the Company. The following examples will expand on this.

Currency Module

Under the currency module, if a company holds any own funds in a currency other than its statement currency, it attracts a Currency SCR. As such, companies are encouraged to hold all their own funds in their statement currency.

Consider the situation of a multi-national with 2 main currencies. Assume their SCRs are equal, by currency and their capital is all in Currency A and is funded at 150% of the SCR. If Currency B goes up by 10% relative to Currency A but own funds are solely in Currency A, the capital ratio will drop to 142.8% (150/{50 x 1.1 + 50}). The company is less prepared to withstand an event as their capital ratio has gone down yet no currency SCR was held.

Take the reverse situation. If 50% of the capital was held in each currency, the Company would have to hold a currency SCR for Currency B. However, if the currencies were to move, the capital ratio would not change.

Interest Rate Module

Under the interest rate module, a company can realize a zero interest rate SCR if it perfectly cash flow matches the assets backing its liabilities with its liabilities AND holds all of its surplus in cash. However, if it does that, should interest rates drop, its many of its Life SCRs will increase as they are the discounted values of the additional cash flows after the shock event. Again, the capital ratio will decrease, resulting in a reduction in security for the policyholder.

A scenario performed demonstrated this impact. If you look solely at the interest rate SCR for the company, you would believe they are exposed to increasing interest rates. This is simply because there are surplus assets. However, if you were to calculate the total balance sheet including SCRs for the company, you will find an increase in interest rates results in an increase in the capital ratio.

Conclusion

The currency and interest rate SCRs should include the other SCRs (after diversification) in their calculation. This is a bit circular as one would want to use SCRs after diversification and these SCRs will impact diversification. This shouldn't be too difficult to do as, now that Solvency II is in place, a Company can look at its prior quarter's SCR calculation to determine the diversification benefits to be applied to the SCR.

Other comments which there is no immediately clear natural home for:

Market Risk: Equity Type 2 as a "catch-all" asset bucket

There are questions over the ability of certain asset types on the balance sheets of insurers to absorb losses in a 1 in 200-year event, e.g. a claims management system specific to a particular company.

Currently these types of assets tend to fall into the Equity Type 2 bucket but it may be argued that the Type 2 charge is not onerous enough for such assets, and it may be more appropriate to have another "catch all" module subject to a higher shock.

Defined Benefit Staff Pension Scheme Risk

There is currently a difference in treatment for Defined Benefit Staff Pension Schemes under the standard formula versus internal models.

- Under the Standard Formula, the market risk elements of the Formula are applied but other risks modules not (e.g. longevity risk). However, firms with an internal model are expected to capture all of the risks relevant to the

	scheme. • The treatment of a Defined Benefit Pension Scheme as a Ring-Fenced Fund is also inconsistent between Standard Formula and Internal Model i.e. specification states no diversification for Standard Formula but is silent for Internal Models. These inconsistencies are unsatisfactory.	
Q1.1		
Q1.2		
Q1.3		
Q1.4	**Non-Life and NSLT Premium and Reserve Risk: Unbundling Premium Risk from Reserve Risk** It would be useful for risk management purposes, particularly for Boards, if the reserve Risk and Premium Risk calculation were ‘unbundled’ in the Standard formula calculation. While this would not necessarily simplify the calculation, it would make it more transparent and easier to communicate.	
Q1.5	**Non-Life lapse risk: Standard simplification** The requirement for Lapse Risk to be calculated on a per policy basis tends to be problematic for the majority of companies. There are a number of simplified approaches being taken by companies, and in some cases the charge is not calculated at all. To ensure consistency across the market, it may be more appropriate for a standard simplification/approximation to be defined.	
Q1.6	**Non-Life lapse risk: Captives** Lapse risk appears inappropriate for captive (re)insurers where the customer is the parent, the company’s raison d’etre is to provide the (re)insurance for the parent group. In particular, the specification of 40% lapse is inappropriate in these scenarios where there might only be one or two underlying policies.	
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Q1.22		
Q1.23		
Q1.24	The capital requirement for the operational risk, as referred to in Article 204 of the Delegated Regulation, does not reflect the loss-absorbing capacity of technical provisions and deferred taxes. For (re)insurance undertakings for which the loss-absorbing capacity of technical provisions and deferred taxes is already allowed for in other risk sub-modules this should also be the case for the operational risk. In order to better reflect economic reality, EIOPA should modify the standard formula such that the loss-absorbing capacity of technical provisions and deferred taxes can also be applied to the operational risk.	
Q1.25	According to our comment in Q1.24 we would suggest to define: The capital requirement for the operational risk shall be equal to the loss in basic own funds of insurance and reinsurance undertakings that would result from extraordinary expenses of min(0.3*BSCR ;Op)+0.25*Exp_ul (see Article 204 of the Delegated Regulation) in the first projection year.	
Q1.26		
Q2.1	The use of external credit ratings creates an inequity in the treatment of investments (including bank deposits) of the various European Member States and presents a significant risk to financial stability. As it is well known the credit rating of corporations which have their basis in a specific state is strongly correlated with the credit rating of their	

	host country. Moreover, it is customary that the credit rating of the corporation is not better than the credit rating of the country in which it operates, unless exceptional circumstances hold. As a result if the credit rating of the country is not satisfactory (e.g. category 3 or less) then effectively most investments (including bank deposits) in the country are also not satisfactory and hence this leads to high market (concentration and spread) and counterparty risks if an insurance company in a low rated country was to support the local economy, albeit the diversification within the country. Furthermore, the insurance companies and mostly the local insurance companies are then obliged to divert their investments out of their host country in order to benefit from better credit ratings. Even though the diversification principle should always apply to reduce the risks mentioned above, the above methodology currently in place creates a spiral macroeconomic effect whereby the movement of investments out of the low rated host country results in a further adverse effect on the economy and thus deterioration in credit quality of local investments which then leads insurance companies to keep disinvesting out of the host country. This of course benefits other countries of higher credit ratings even more thus widening the gap between high credit quality governments from low credit quality governments. The above spiral effect is in effect a double hit on the solvency requirements of insurance companies of which the host countries have low credit rating. This effect does not only impact the credit quality of their investments but also impacts all items of their balance sheet (e.g. increase in bad debts) as well their economic prospects. In our opinion, in all SCR market and counterparty risk modules where the credit rating is taken into account there should be a **dampening effect** which relates to the difference of the credit rating of the individual investment (including bank deposits) and the investment's host country. This dampening effect would be maximum if the rating of the investment is the same as that of its host country. This is in line with EIOPA's assumption that sovereign investments within the European Union are regarded as 'risk free' under the current standard formula rules, in the sense that this does not create inequitable shifts in sovereign investments in the EU because of differences in government ratings which would cause the spiral macroeconomic effect described above.	
Q2.2	See Q2.1	
Q2.3		

Q2.4	Internal ratings must not be considered. Such ratings introduce too much complexity to build and maintain internal models, while distorting comparison between players. Such distortions shake comparability principle among undertakings. At the same time, limits of internal models are highlighted by current discussions concerning the setting up of a floor (banking regulation discussions).	
Q2.5	Market implied ratings must not be used stand-alone. Such ratings would be industry-driven and not consider enough individual component. Such ratings would introduce too much complexity to consider all information required.	
Q2.6	Accountancy-based measures must not be used stand-alone. Accountancy-based measures must be used to challenge external ratings already used within internal reviews processes. In case of gaps within accountancy-based measures and external ratings, infra-annual reviews could be performed.	
Q2.7	Accountancy-based measures could be introduced only to challenge and refine external measures from an internal perspective.	
Q2.8		
Q2.9		
Q2.10		
Q3.1	**Market Risk: EEA Government Bonds** EEA government bonds are treated as risk-free within the market risk module of the Standard Formula. Given market events in the recent past should this continue to be the case? If the treatment of EEA government bonds were to change, then the treatment of exposures guaranteed by these governments would also become more market consistent.	
Q3.2	Criteria for third party guarantee must be harmonized with banking framework: explicit guarantees are too restrictive. Notably the fact that a counterparty is of strategic importance for a sovereign (public service mission, funding from State budget, no profitability aim, etc.) must be taken into account although no explicit guarantee is given (i.e. national companies engaged in the storage of energy as per the European directive of the IEA: Cores, Sagess, Apetra)	
Q3.3		
Q3.4	For unlisted assets: mostly guarantees for Project Finance and Real Estate (ex: construction guarantee). In real-estate	

	bank guarantee covering part of the rent.	
Q3.5	Guarantor rating may be recognized unless it is inforce at least for the next 12 months.	
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Q3.10		
Q3.11	Solvency II must incorporate the categorization set out in Article 115 of the CRR. This principle based analysis must be promoted provided a public database harmonized between EBA and EIOPA. An intermediate treatment must be set out for unlisted local authorities.	
Q3.12		
Q4.1	**Risk mitigation techniques in the area of longevity risk transfer** The RMT aim at reducing longevity risk using longevity swaps or reinsurance contracts. An increasing number of such contracts have been closed during the past years. The majority of buyers of such contracts are companies in the UK. A list of such contracts can be found via the link http://www.artemis.bm/library/longevity_swaps_risk_transfer The contracts take away the longevity risk for pension schemes or portfolios of annuities. Besides UK some unique examples can be found for other countries (pension schemes). No such solutions can be observed for German annuity business of insurance undertakings. Altogether, RMT for the longevity risk are limited to well-defined portfolios. Most of the transactions are related to pension schemes. Annuity business of life insurance undertakings is often characterised by additional features. It remains questionable if the price for such a risk transfer – if possible at all - is acceptable for an undertaking. **RMT and market risk, currency risk** **RMT focussing on assets:** We would recommend a clear distinction between	

a) risk mitigation strategies and
b) instruments used for the implementation of these strategies

(see Article 209 where the term « risk mitigation techniques » is used for both).

Sometimes it is common and economically reasonable to use short term instruments for long term risk mitigation (e.g. rolling FX hedges).

Recital 72 of the Solvency II Delegated Regulation states that " (…) insurance and reinsurance undertakings should not take into account RMT that rely on insurance or reinsurance undertakings taking future action, such as dynamic hedging strategies or future management actions, at the time that the stress occurs. Dynamic hedging strategies and future management actions should be distinguished from rolling hedge arrangements (…)"

However, explicit criteria to distinguish between dynamic hedging strategies and rolling hedge arrangements are missing in the delegated regulation.

Dynamic hedging strategies and rolling hedges are vital for modern asset liability management. Some widely used rolling hedges have dynamic components included (e.g. rolling equity hedge). In line with the principle based approach of Solvency II, a set of principles and examples for both types of strategies would be beneficial.

Furthermore, the following questions regarding the distinction between dynamic and rolling strategies arise:

- Which implications should this distinction have on risk capital calculations?
- How should dynamic strategies and rolling hedge agreements be considered when calculating the SCR?

Where a company purchases an Adverse Development Cover ("ADC") – i.e. a reinsurance treaty that limits the deterioration of its reserves – it is not allowed to take credit for this risk mitigation in the Standard Formula. (This point has been argued at length with national supervisory authorities and EIOPA; although it has not been officially communicated and there may be some companies out there still taking credit for ADCs within the Premium and reserve Risk module of the Standard Formula.) It is a very straightforward exercise to calculate the 1-in-200 reserve risk shock and apply the terms of the ADC to calculate the ADC recovery in this scenario, effectively capping reserve risk, before aggregating with Premium Risk, so there is no reason why not to be able to take full credit for these RMTs.

Likewise, where a company has an Aggregate Stop Loss which protects against poor performance of the book as a whole – effectively capping the loss ratio – it may not be allowed to take full credit for this risk mitigation in the Premium and Reserve Risk module of the Standard Formula. While some NSAs advise

	and/or require Companies to have these risk mitigation techniques, some others deter them from having them altogether. These are two very important points; companies are being deterred from buying these important risk mitigation tools because they may not get adequate recognition of solvency relief. They are important risk mitigation tools and help preserve the stability of the sector. Moreover, it is mainly Companies under the standard formula who would benefit most by these instruments and therefore implementing a (partial) internal model is not a solution.	
Q4.2	Definition of the RMT with respect to rolling FX hedges: The RMT is usually defined as a long term strategy to mitigate the FX exposure with a time horizon which is typically longer than 12 months (e.g. « no unhedged FX exposure »). The instruments used for the implementation of the RMT are typically short term (1-3 Month) FX forward contracts, which are regularly adjusted and rolled in line with the corresponding long term strategy. Typically, the maturity of the instruments used and the frequency of the hedge adjustments are shorter than 3 months to ensure proper hedge efficiency and to minimize the hedge error / basis risk. This RMT is widely used throughout Europe by insurance companies and asset managers. If the term « risk mitigation techniques » is not interpreted as strategy (for example « no unhedged FX exposure ») but as the instruments used for the implementation of a given strategy (e.g. short term FX forward contracts), then the requirements of Article 209 §3b would not be met. According to this article, the replacement of the RMT should not be more often than every 3 months, and the replacement frequency and the maturity / remaining lifetime of the instruments would necessarily be at least 3 months when acquired. High adjustment frequency and the use of short term instruments with corresponding high frequent rolling dates are required for the strategy described to ensure high hedge efficiency and to minimize the basis risk. Less frequent adjustments of the portfolio would lead to an increased exposure to simultaneous movements in FX rates and underlying investments. Using longer dated instruments for the hedge also increases other risks, e.g. the exposure to interest rate risk (as the market value of FX forwards is sensitive to interest rate changes). The requirements / criteria could be altered in a following way:	

	A clear distinction should be made between a) a risk mitigation strategy and b) instruments used to implement a risk mitigation strategy. The 3-month frequency requirement of article 209 §3b should only be applied to the strategy and not necessarily to the instruments used in line with the defined strategy. Whereas it seems reasonable that the lifetime of the strategy should be at least longer than the following quarter to be recognised, the instruments used for the implementation of the strategy should be allowed to be shorter dated with higher adjustment frequencies. Not recognizing high adjustment / rolling frequency for FX hedges will force investors to run less efficient strategies with low adjustment frequency and therefore introduce additional economic risks.	
Q5.1	**Please note that the issues discussed here relate to both Non-Life and Health NSLT business** **Premium Volume and Premium Risk Volatility Parameter** The premium volume measure is arguably flawed for one-year non-life business in relation to contracts where the initial recognition date falls in the following 12 months. The wording was originally more correct, but changed at some point prior to the start of Solvency II. The original wording excluded those premiums earned during the 12 months after the “valuation date” whereas the final wording excludes those premiums earned during the 12 months after the “initial recognition date”. This means that the volume measure excludes some of the risk attaching to business which will be written in the next 12 months. However, we also need to recognize that the premium risk methodology is problematic when applied to multi-year policies as it is applying the 1/200 year shock to each and every year of the multi-year policy. This is inconsistent with the 1 year time horizon because the underwriting risk attaching to each of these years is in to a great degree independent. Similarly, if the volume measure is amended to exclude those premiums earned during the 12 months after the “valuation date”, then (on average) for one year business there will be 1.5 years of volume. The (1/200) shock factor should therefore be adjusted downwards. This could for example be done by using a much	

lower parameter for those premiums earned after the first 12 months, to assure alignment with the basic principle of SII of the 1 year time horizon. See response to Q5.2.

Other Impacts of the Volume Definition for One Year Business

[The discussion below provides a summary of a number of issues relating to the definition of Premium Volume. If EIOPA would find it useful, we can provide a paper setting out the discussion in greater detail.]

a) Renewals which are concentrated at a point in the year – Capital charge stability throughout the year
It is important that the final formulation should ensure that the volume measure should be stable over the year and the difference between insurance companies having slightly different renewal dates should be small.

Changing the formula as suggested would increase not only the volume measure for multi-year contracts but also for one year contracts. This has negative side effects. For example, this would lead to an up and down movement of the volume measure (and thus also movements of premium risk) from one quarter to the other for one year insurance contracts that are renewed at a single point during the year, e.g. 1st of January. In that case according to the definition gives the following volume measure for a contract with annual premium 100 (which are recognized prior the 1st of January):

• at end Q4: Volume measure = 100 or 200 (interpretation differ between national supervisory authorities and thus between countries)
• at end Q1: V = 175 (it includes contracts that are renewed the 1st of January the year after)
• at end Q2: V = 150
• at end Q3: V= 125

This is not a desirable situation and is not the situation using the current definition. It is not clear how to avoid this cyclicality in the volume measure using the new definition, although it would be lessened by applying a lower risk lower parameter for those premiums earned after the first 12 months.

b) Definition of Initial Recognition Date

We think that one part of the definition could be clarified. The premiums to be included covers the contracts whose “initial recognition date” falls within the next twelve months. This notion of “initial recognition date” has been interpreted in different ways, for example:

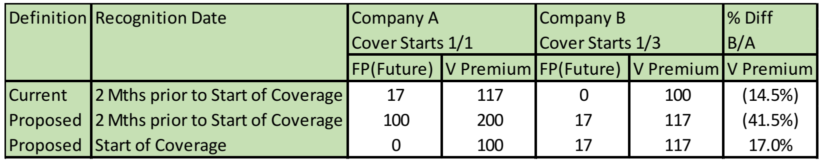
- It could refer to the date where the contract is certain, i.e. the beginning of the frontier
- It could refer to the beginning of the coverage period

The difference between the two interpretations can be highly material, so a consistent approach is required, to avoid market inconsistencies using the new definition.

The example below, based on a French example, shows a 100% difference between the two calculations.

Example

Consider two companies, one (Company A) whose contract runs from the 01/01/N to the 31/12/N and another (Company B) whose contracts run from the 01/03/N to the 28/02/N.
For both companies the 2018 contract is automatically renewed unless either the insurer or the policyholder renege by two months prior to the renewal date. For both companies, the 2016 and 2017 premiums are equal to 100.
However, under the new definition, the first company could have a SCR significantly bigger than the second, without any real risk difference.



Definition	Recognition Date	Company A Cover Starts 1/1		Company B Cover Starts 1/3		% Diff B/A
		FP(Future)	V Premium	FP(Future)	V Premium	V Premium
Current	2 Mths prior to Start of Coverage	17	117	0	100	(14.5%)
Proposed	2 Mths prior to Start of Coverage	100	200	17	117	(41.5%)
Proposed	Start of Coverage	0	100	17	117	17.0%

This example shows a **strong market distortion**, and an incentive to optimize the renewal date of contracts. Under option 2, by moving the renewal date from 01/01 to 01/03, one would reduce the Premium Volume Measure by circa 40%, without any real change in the risk profile.

	A possible solution is to replace “initial recognition date” by “beginning of the coverage period” would allow both a non-ambiguous formula and a result similar to the current approach. This definition would still be compatible with the Solvency Directive requirements, by including all the contracts which are effectively renewed during the incoming year.	
Q5.2	**Please note that the issues discussed here relate to both Non-Life and Health NSLT business** **Risk Factors** Since the calibrated shock aims at reflecting a 1/200 year event, it should not be applied on several years of claim occurrence. Therefore, if the FP future and FP existing factors remain in the formula, and the definition is changed to the new definition for FP future, we would propose having a separate (much lower) risk parameter for this part of the premium volume. This would also address the problem with the existing formula when applied to multi-year contracts. One practical way to achieve this is outlined here: One part of the premium risk is the risk of underestimating the expected loss, i.e. (a1) estimation errors, and (a2) the risk of inflation and other claims environment changes. The other part is (b), the risk of random variation which can only occur during the contract coverage period. However, only Ps is subject to the all of the elements of premium risk. FP_existing and FP_future are not subject to (b) during the 12 month period relevant to the SCR. The formula could therefore be changed to : $V(prem,s) = max(Ps;P(last,s)) + fs * FP(existing,s) + gs * FP(future,s)$ where the factors f and g refer to the portion of the premium risk relevant to the volume of FP_existing and FP_future, respectively.	

	- For FP_existing, it could be assumed for simplification purposes, that the premium cannot be adjusted. Thus, f needs to reflect the risks (a1) and (a2) mentioned above, but not (b). - For FP_future, the premium can be adjusted to reflect any inflation or claims environment changes that occurred until the initial recognition date of the respective contract. Thus, g needs to reflect only the risk (a1). As a consequence, the factors f and g would need to be calibrated or estimated by experts, and would take values between 0 and 1. An alternative to the proposed adjustment could take the duration of premium guarantee into account in a more granular way. However, this would probably increase the complexity in an unnecessary way. **Recognition date** Our proposal to replace “initial recognition date” by “beginning of the coverage period” would remove the current ambiguity in the definition and the potential for inconsistency of application across the market.	
Q5.3	**Please note that the issues discussed here relate to both Non-Life and Health NSLT business** Yes. This would increase the Premium risk by around 50% for portfolios with 1 year contracts that are renewed during the year. It differs roughly between 0% and 75% for portfolios that renew at 1 point during the year. See an example in our response to Q5.1. Having a different risk parameter for the FP future and FP existing components of the Premium Volume (as proposed in our response to Q5.2): would reduce the impact of the new definition.	
Q5.4	**Please note that the issues discussed here relate to both Non-Life and Health NSLT business** **Summary** The volume measure for non-life and NSLT Premium Risk is total premium including commission, expenses and expected profit. Arguably it would be better to use the premium net of the three last items for a first estimate of the risk (with a suitably calibrated higher premium risk factor).	

For some LoBs which are very homogeneous and have reasonably stable claims ratios, the pricing strategy is likely to have a rather small impact on the volume measure: e.g. assuming that premium cycles have an amount of 5-10%, the effect on the premium risk is within the calibration error.

The actual issue with the premium risk is possibly elsewhere: under/overpricing of existing contracts are taken into account in the premium reserve. However, explicit underpricing of future business (FP_future), is not considered: neither in the risk premium calibration nor in the balance sheet.

For more heterogeneous LoBs, (e.g. the “Miscellaneous” line of business) which contain a mix of low and high commission/profit products, there is a risk that premium risk is incorrectly calibrated.

Furthermore, for a more accurate estimate of the risk, risk mitigating schemes in addition to reinsurance should also be recognized. For example, acquisition costs are often variable and based on the performance of the underwritten portfolio. We would support adjustments to the premium volume measure which were designed to capture such methods of risk mitigation.

Detailed Discussion

[The discussion below provides a summary of how the premium volume measure could be adapted to allow for premium adequacy / pricing strategy. If EIOPA would find it useful, we can provide a paper setting out the discussion in greater detail.]

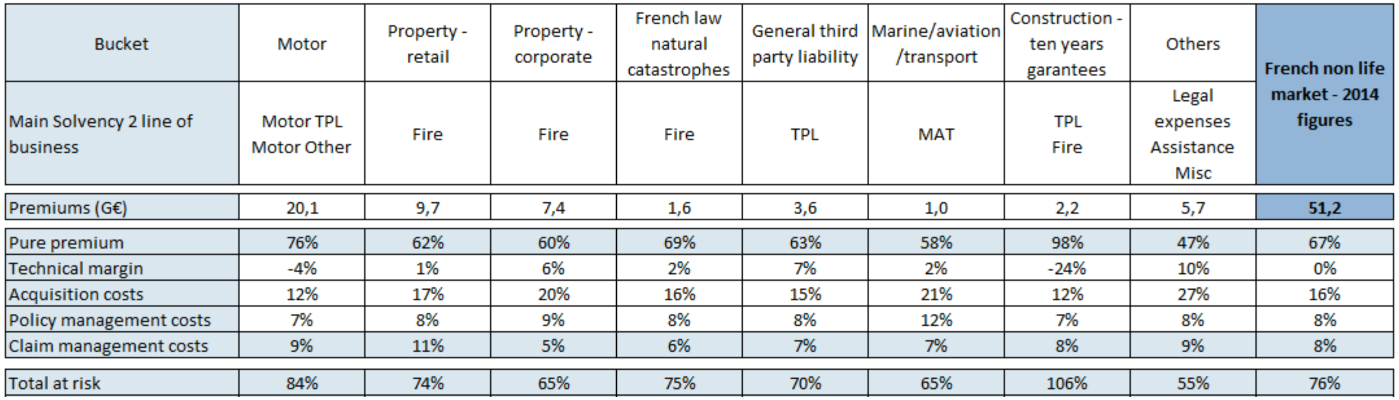
Although the current definition of volume of premiums allows for a relatively simple assessment, it does not take into account the ability of undertakings to price their risks in a precise or prudent manner, and worse, by requiring them to hold more capital, this definition of the volume disadvantages prudent undertakings.

A review to correct this inconsistency seems necessary. A way to decrease dependency on pricing strategies might be to adjust the premium volume downwards or upwards depending on the expected result E(R). E(R) here refers to expected profit component of premium.

	Several approaches are possible, for example: • One approach might be to modify the premium volume formula to add an expectation of result, the formula would then be the following ($3\sigma(V-E(R))$) where *E(R)* would be calculated by **each company** and each LoB from a formulation to be defined. • Another option would be to set the estimate of the volume measure not on the expected premiums to be earned but on the expected premium to be earned corrected to the 100% Combined Operating Ratio (COR) level. This can be done since for the BE premium provision an estimate on the COR for the existing business needs to be done anyway. • A third option would be to base the calculation on premiums **net of commissions**. This has the advantage of ease of calculation and application but would not fully address the issue. • A fourth option would be to replace premium indicators by corresponding expected claims and claims expenses cash-out flows. This definition would make a direct link between Best Estimate Liability and the SCR.	
Q5.5	**Please note that the issues discussed here relate to both Non-Life and Health NSLT business** See Q5.1 for our observation and suggestion regarding the definition of the “initial recognition date”. The ambiguity in this definition become more material if the premium volume definition is changed. **Premium Risk: Calibration for Miscellaneous Financial Loss** We question the volatility applied in this class for Premium Risk, as it appears to be too high relative to the actual risk. In particular, this is a problem for business such as extended warranty, where the premium volume calculation is such that it can reach a multiple of annual earned premium. This combined with Miscellaneous LoB standard deviations results in excessively high premium and reserve risk. This is a specific example of the issue with multi-year policies described in the response to Q5.1 **Premium Risk – Consistency with SII Principles and Life Insurance Business** [The discussion below provides a summary discussion of some inconsistencies between the premium volume and SII principles and the treatment of life risks. If EIOPA would find it useful, we can provide a paper setting out the	

	discussion in greater detail and how the inconsistencies could be addressed.] *Issue 1 : Consistency between balance sheet and capital charge definitions* : One of the underlying concepts of SII is that the SCR assessment is based on the 1/200 year economic loss in own funds. In principle, the SCR assessment should be based on a volume at risk that is consistent with the one used to assess the economic commitments. Any gap between the perimeter of premiums underlying the assessment of the SCR and the perimeter of premiums underlying the assessment of the Best Estimate of Liabilities creates a mismatch between the assessed risks and the ability of the balance sheet to cover these risks by expected future profits. Including future business in the calculation of the SCR introduces such a gap. These gaps should ideally be eliminated, or at least strictly limited. *Issue 2 : Consistency between Life and Non-Life risk assessment* The risk assessment performed on Life risks is based on an instantaneous shock on liabilities existing at the valuation date, taking no account of future contracts. There is no theoretical reason why the Non-Life modules assessment method should not be aligned with Life ones. **Premium Risk: Consistency with sound risk management** Most reinsurance arrangements are yearly renewable contracts covering the full calendar year to come. Using reference to previous year Premiums in the premium risk volume measure prevents undertakings from taking proper allowance of risk mitigating schemes set to manage risk on the year to come. For example, let’s consider a company that has retained it whole business during year (N-1) and that decides to cede a 50% quota share of its whole business on year (N). On year (N), this company would cede approximately 50% of its margins and nevertheless maintain 100% of its previous year capital requirement. A possible solution would be to apply the prospective reinsurance arrangements when netting down prior year earned premiums.	
Q5.6	**Quantitative Analysis** In the time available to provide this feedback we have not been able to perform a Europe-wide analysis. However, we provide below an analysis based on 2014 consolidated data on the French market. Using the proposed “first estimate” would reduce by some 24% the premium risk capital charge. But this decrease in not homogeneous on the market. Depending on the insurance bucket (to be linked to Solvency 2 Lines of Business -LoB), the change	

could vary from an increase by 6% (10-year inherent defects guaranty) to a decrease by 45% (Miscellaneous Non-Life).



Bucket	Motor	Property - retail	Property - corporate	French law natural catastrophes	General third party liability	Marine/aviation /transport	Construction - ten years garantees	Others	**French non life market - 2014 figures**
Main Solvency 2 line of business	Motor TPL Motor Other	Fire	Fire	Fire	TPL	MAT	TPL Fire	Legal expenses Assistance Misc	
Premiums (G€)	20,1	9,7	7,4	1,6	3,6	1,0	2,2	5,7	**51,2**
Pure premium	76%	62%	60%	69%	63%	58%	98%	47%	67%
Technical margin	-4%	1%	6%	2%	7%	2%	-24%	10%	0%
Acquisition costs	12%	17%	20%	16%	15%	21%	12%	27%	16%
Policy management costs	7%	8%	9%	8%	8%	12%	7%	8%	8%
Claim management costs	9%	11%	5%	6%	7%	7%	8%	9%	8%
Total at risk	84%	74%	65%	75%	70%	65%	106%	55%	76%

Qualitative Comments

The impact directly relates to how much the Combined Operating Ratio (COR) for a specific line of business is below or above the 100%. So, if an insurer has a COR measure of 102% then it requires an uplift in its volume measure by a factor 1.02 to meet the 100% COR, this will likewise increase the premium risk by around 2%.

Q6.1

Based on the observation that there were many formal applications for USP made by Insurance companies being specialized in legal expense insurance in Germany, Belgium and Austria we regard this as the most important segments for which recalibration needs consideration. However, this segment and other segments like assistance and credit-insurance which we would suggest considering are already listed. We do not have additional suggestions

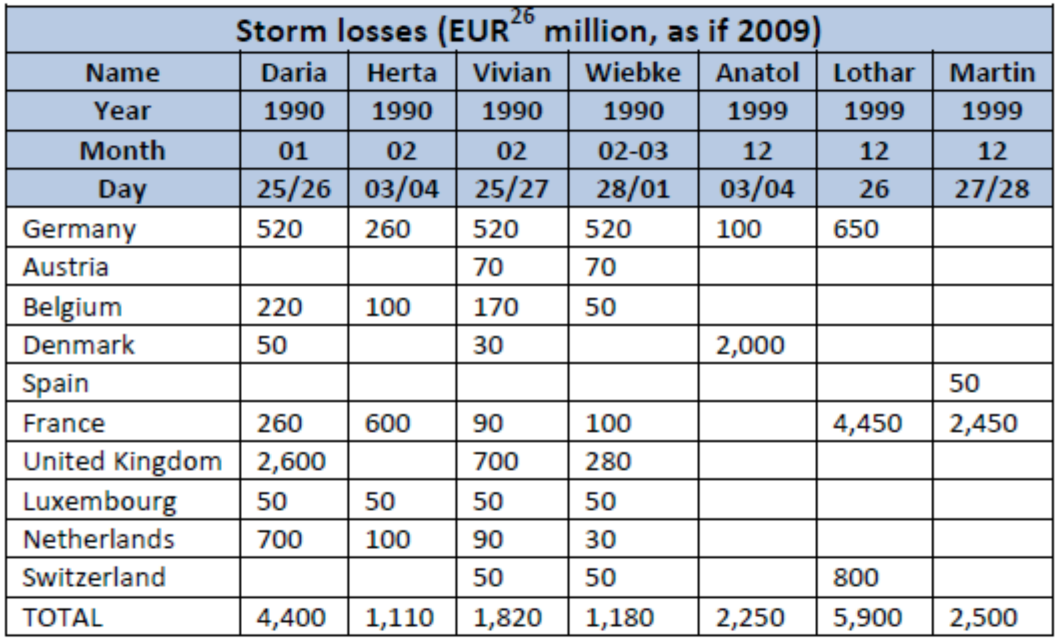
Q7.1

The specifications should not be simplified but maybe more precise on different topics (see below)

The data requirements underpinning the Non-Life CAT risk module (in particular Nat Cat risk) are extensive, and are very onerous for smaller insurers: e.g. data by cresta zone for Nat Cat, largest sum insured in a 200m radius for Man-Made Fire, etc. QIS 5 had a separate premium factor-based method which was not ideal, but at least provided some

	alternative. Could something like this be considered again?	
Q7.2	Thanks to the EIOPA spreadsheet, calculation of capital requirement for natural catastrophe risk does not necessarily need to be simplified. Technical studies have been performed in the calibration papers, so what could be interesting is to work with all data collected since the official launch of SII in 2016 and adjust the parameters. Some formula should be re-worked considering new detailed information.	
Q7.3	**Suggestions :** • WS correlations are based on RMS v9, would it be necessary to update with new models (v16)? • Clustering (see in next questions) Generally speaking, the standard formula is higher for almost each EU country than the highest CAT model used by the market (200 years rp). At the EU level, it seems that the most conservative 200 years RP from model used by the market is approximately 30% over the standard formula. Nevertheless, the diversification effect seems in line with the most conservative diversification effect model.	
Q7.4		
Q7.5		
Q7.6	From what study/model does the damage ratios come from, because compared to ELA loss (2014), SII scenario can be disconnected (very high or very low compare to the French highest hail loss). New models have been built on the market, shouldn't a global study on each model be done to summarize all answers in one scenario (RMS, Guy Carpenter, Willis, Swiss Re…). 200 years Return Period for several of these models are over the SII ratio. This scenario might be underestimated/mis-calibrated	
Q7.7		
Q7.8	• General comment: make additional distinction between lines of business, if one company is more specialized on one LoB with a more heavy damage rate, it should be identified. • Hail: generally speaking we see that the multiplication by 5 of the TIV motor underestimate the motor losses amount for the biggest historical hail losses (Fr market). This remark is also true through the market hail models.	

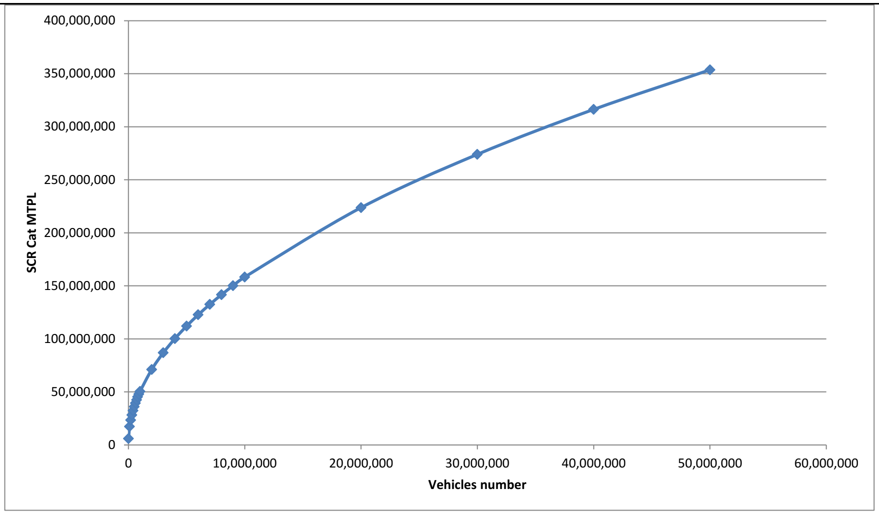
	• For Ireland, only Wind is included in the Nat Cat module and Flood and Freeze are excluded. However, the main source of Irish natural catastrophe losses has tended to be freeze and flood related, rather than wind related. • It is not always clear how to correctly apply the reinsurance structure to Catastrophe shocks. Should we consider attritional losses, number of liability losses etc., and if so how should we do this? There should be a clear and standardized guidance on this topic.	
Q7.9	• Considering all the information provided by clients since 2016, shouldn't a global modelling be done on this aggregated portfolio via all software with all detailed information and re-estimate parameters? *"Applying deductibles and limits to a portfolio can have a material impact on the 200-year Return-Period Occurrence Exceedance Probability, depending on the particular composition of the portfolio (residential, commercial, industrial, etc.) (e.g. we have observed on several portfolios between 5% and 50% of decrease from 'Ground Up' to 'Net of Limit and Deductible')"*	
Q7.10	At European level we have observed: - 1990 : Herta, Vivian, Wiebke, Daria - 1999 : Anatol, Lothar, Martin	

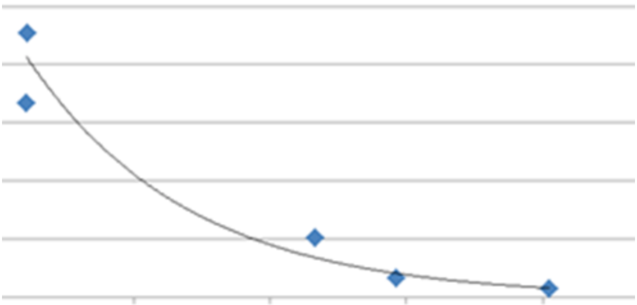


Storm losses (EUR[26] million, as if 2009)							
Name	**Daria**	**Herta**	**Vivian**	**Wiebke**	**Anatol**	**Lothar**	**Martin**
Year	**1990**	**1990**	**1990**	**1990**	**1999**	**1999**	**1999**
Month	**01**	**02**	**02**	**02-03**	**12**	**12**	**12**
Day	**25/26**	**03/04**	**25/27**	**28/01**	**03/04**	**26**	**27/28**
Germany	520	260	520	520	100	650	
Austria			70	70			
Belgium	220	100	170	50			
Denmark	50		30		2,000		
Spain							50
France	260	600	90	100		4,450	2,450
United Kingdom	2,600		700	280			
Luxembourg	50	50	50	50			
Netherlands	700	100	90	30			
Switzerland			50	50		800	
TOTAL	4,400	1,110	1,820	1,180	2,250	5,900	2,500

Table B: 1990 & 1999 series of storms losses

Q7.11	Yes for insurance contracts no limit of number of events (the only definition of event is linked to the speed, WS' speed has to be over 100Km/h). Reinsurance contracts do take into account clustering, in France: Via XL treaties: in general 2 reinstatements (= 3 capacities) on low layers of reinsurance, 1 reinstatement (= 2 capacities) on higher layers, Via XL Aggregate treaties (aggregation of retentions, it is in general deemed to other reinsurance in place).	
Q7.12	Yes (graph at European level 3 WS in 1999 : Anatol, Lothar and Martin, an insurance company at European level might have been hit for these 3 historical events)	

Q7.13	How to take this into account: - National level: 3 WS. It is possible to add a scenario (likely as the 100% +20% and the 80% and the 40%) which could be 27% + 27% + 66% (based on the year 1999 at the EU level). European level: we recommend to take a look to the ERA 40 database which could provide some information. The cat modelling firms are also developing more robust clustering methodologies in their tool.	
Q8.1	 On the French market, all vehicles are considered with a limit over 24M. The number of vehicles is around 38e10^6 which correspond to a scenario of 310M. Losses at a European level are unlimited for a limited number of countries (France, UK, Belgium, and Germany). Important historical losses known are over EUR 50M. This scenario can be reached around 1 e10^6 of vehicles. No enough statistics to provide more feedback.	
Q8.2		
Q8.3		
Q8.4	Following different tools, over 100m, damage rates are below 100% of destruction for important bombs. It may be possible to have a proxy by using a percentage of the TIV. It seems to have an exponential relationship	

	between TSI and the biggest accumulation for a few French players. 	
Q8.5	The formula has evolved between QIS 5 technical specifications and allows the company to split the amount obtained in several claims in order to apply non proportional reinsurance. The main challenges are on the n claims to work on, should we retain the max limit x n claims, if the max limit used concerns only 1 claim, should we then use the next limit and reallocate the total amount to an additional claim? Premium as a proxy for risk exposure in the Liability Catastrophe Scenario might well be very misleading. If premium rates double then the catastrophe charge doubles (before application of reinsurance) even though exposure has not changed. The catastrophe charge can be less than the limit if not much premium is written; this is particularly the case for captive (re)insurers. ?	
Q8.6	No challenge, just a suggestion to be more in line with Basel III	
Q8.7	Liability risk : From the total amount of capital requirement, to be able to apply reinsurance we have to divide the amount by the biggest limit time 1.15. It appears that (at least for the Fr market) it is not justified: • LAE are included in the total claim amount (cost inclusive) • On the French market it never happens that a claim exceed the original limit When the company is big, then the number a claims (n_i) could become big and it seems overestimated. (Ex.	

	With an EPI of 300m€ and a limit = 26m€ the expected number of claims is 10 *-300/(1.15*26)-* which is very high. Fire risk: AZF is known to have an equivalent TNT of 20T, but on an industrial site. Having such a bomb on the most important aggregation of SI in a circle of 200m radius correspond of having more than a truck full of explosive. Most of scenarios identified by company are far away from refineries, armament… Extract of Calibration paper : *Scenario Rotterdam* *Consider an explosion or fire in the oil refineries at the port of Rotterdam – one of the largest ports in the world. Large volumes of crude oil are stored around the port, and these catch fire as a result of the explosion. The fire causes a large number of fatalities, closure of the whole port (business interruption), almost complete destruction of port buildings and machinery as well as generating a highly toxic cloud of fumes.* *Scenario Armament company* *Due to a short circuit in an army aircraft a fire occurs in the premises of an armament company. In the building are 10 highly developed fighter jets, which are destroyed along with the hall and machinery.*	
Q8.8	Yes it should be defined, but in reality it is the net max scenario which should be retained.	
Q8.9	This is not the case in our opinion. The fire risk sub-module produces an overly conservative measure of risk concentration and is not in line with the measures actually used by undertakings in their underwriting process. This is in particular the case for companies writing mainly or only household business, no commercial nor industrial.	
Q8.10	The estimated maximum loss (EML) represents a more risk sensitive measure of the risk concentration in line with the calibration objective of Solvency II. Fire risk: AZF is known to have an equivalent TNT of 20T, but on an industrial site. Having such a bomb on the most important aggregation (rarely near from an industrial area) of SI in a circle of 200m radius with 100% of losses correspond of having more than 2 big trucks full of explosive. (see 8.7) 100m radius with 100% damage seems to be more in line with a possible scenario of a bomb truck.	

Q8.11	The definition of the PML is not defined at country level for France, it is generally linked to sums insured which is not consistent from one company to another one.	
Q8.12	The part which is more difficult is the correctness of the address. If all addresses are well known, this should be then quite easy to perform via SIG tools. The main issue is the data quality: tools exist to geocode risks when data provided are correct or known. For geocoded risk, as a first step of standardization, the EIOPA should give a standard methodology to be applied: For non-geocoded risks, a probabilistic disaggregation methodology can be used. A first step to improve quality could be to generalize address normalization tools in the underwriting process of companies. This has been used with relatively great success in some countries	
Q9.1		
Q9.2		
Q9.3	Catastrophe Risk – Mass Accident Scenario It is felt that this scenario creates a disproportionate risk charge for companies that are exposed to this risk. For example, • for a captive reinsurer of a Bank's Life and Personal Accident book, the scenario is that the head office (in every country) is subject to a mass accident. [To put this in context, there are 6,800 FDIC insured banks in America. However the only instance (based on a Google search) I of a Mass Accident of this nature was the 16-story headquarters of Northwestern National Bank (now Wells Fargo) in Minneapolis which was destroyed by fire in 1982, 46 years ago. • charges. Similarly for Workers Compensation Catastrophe Risk, a concentration of employees in one location leads to excessive CAT	
Q9.4		
Q9.5		
Q10.1	Our experience shows that the Lee Carter model is (among others) a quite established approach to model future mortality rates and longevity trends. The model described is an amelioration of the Lee-Carter model since it is assumed that the observed number of deaths (given the exposures) follows a Poisson distribution. The main drawback we see in this model is the fact that it does not explicitly take into account the cohort effect	

(generational effect) since the main parameters are age and calendar year. One way of integrating this dimension (cohort) is to use instead a **Cairns-Blake-Dowd model (CBD model)** in which this cohort effect is considered.

We would therefore appreciate clarification on the process how a unique stress factor for all ages can be determined. In the discussion paper a unique stress factor is derived by using the age of 60. Please specify the method how the age of 60 is chosen.

The stress factor in the standard formula should be reviewed periodically every few years. The trend factors of the German DAV mortality tables for annuities are reviewed regularly.

For the **mortality risk** we do not believe that Lee Carter would be applicable because the model is targeted to model mortality trends which are not relevant for the mortality risk. Therefore we would recommend not to apply any adjustments to the current methodology for the mortality risk. The risk factor of 15% should be reviewed taking into account updated data bases. .

The Lee Carter model could be an appropriate model as it is transparent, robust, and is able to take into account parameter uncertainty in the stress factor. Further the Lee-Carter model generates confidence intervals which increase in time. As opposed by the current instantaneous shock of the Standard Formula, this is more in line with the true nature of longevity/ mortality risk. It has however a number of limitations that should be considered:

- Consistency between projected mortality trends in the risk model and the best estimate model, e.g. in case best estimate assumptions are not based on a Lee-Carter model.
- Absence of cohort effects
- The Lee-Carter model is suitable for projection population mortality rates. However, the uncertainty in portfolio mortality rates should also be accounted for. In principle, this could be done by applying Lee-Carter directly on portfolio data, but in practice the amount of portfolio data might not be sufficient.

In general these limitation may make the Lee-Carter model less suitable for use in regions with strongly expressed cohort effects.

We generally support a more sophisticated approach to determine the stress to be applied in the standard formula.

We would still recommend to calibrate a unique stress factor for all ages. Different age-dependent stress factors may be more appropriate but they would increase the complexity of the calculations considerably. In addition quality and volume of the data base could be reduced considerably. It might moreover not be possible for all insurance companies to implement such stresses.

Considering alternative models, it is useful to take a broader view on longevity risk in general. Longevity risk is typically long-term, i.e. the risk is of an adverse trend which unfolds over a long period of time. However, the SCR definition as used in the Solvency II guidelines indicates that it is useful to know how much expectations of future mortality rates might change over a single year.

The long-term nature of longevity risk has thus no natural fit to “1-out-200 over one year" approach. Therefore, the bulk of the currently available Trend Uncertainty approaches can be split into main categories:

- Risk Models based on a multi-year (or run-off) approach,
- Risk models based on a one-year risk horizon.

A one-year risk model assesses the potential consequences of an annual Best Estimate assumption update. During a one-year period, additional information from new mortality observations becomes available (resulting in recalibration of the model parameters) as well new insights in the underlying generating process (possibly resulting in model changes).

The Solvency II guidelines dictate the basic principle that the SCR amount for any risk type should reflect the Own Funds impact of a manifesting (one-year) shock. From this perspective, it feels natural to model the risk in terms of a one-year assumption update. This requires a dataset containing a sufficient volume of population mortality projections as used in the past by the risk taker.

We do not believe that it is practically realistic for insurance companies using the standard formula to implement their own Lee Carter model (or comparable model) based on their best estimate mortality assumptions. Therefore, a standard calibration of the stress factors is necessary.

	The Netspar study as well as the MRC approach (used references in the discussion paper) are both based on a so called multi-year approach. A multi-year approach is based on the principle that the consequences of all manifesting risk that can emerge during the run-off, should be modelled. In practice, the longer risk horizons are combined with a multi-year confidence level lower than 99.5%. Within the multi-year approach, the SCR for longevity risk should be able to absorb the potential impact of structural changes in mortality improvements. Lee-Carter type of models are not able to generate various trend regimes (i.e. account for trend breaches). Furthermore, the short term volatility should not dictate the long term uncertainty. As each mathematical model has its own specific view on the future trend uncertainty, model risk cannot be disregarded. There will be many models that are consistent with the used data. So, in the end, the specific choice of model will be subjective. Backtesting seems to be crucial then in order to substantiate the calibration. As part of the validation of predictive models, the backtesting compares the predicted (i.e. modelled) losses with the actually experienced losses in the past. In general, the value at risk (our SCR) should be reconsidered if the observed losses (generated by mortality assumption updates) are not in line with the risk modelling. Both approaches suffer from their own limitations. Unfortunately, there is no direct link between the two approaches; deriving a one-year longevity stress from a multi-year calculation is tricky. All in all, a stochastic model based on the multi-year approach should be preferred to provide an initial assessment of the required level of the SCR.	
Q10.2	A standardized approach has automatically the drawback that model and parameter might not correctly reflect the specificities of the undertakings portfolio. Nevertheless, we would recommend to take account of parameter and model risks by applying some level of prudence in the calibration of the risk modules. It is worth noticing that the measure of model risk is another element that should be taken into account when choosing the final model. Furthermore, it seems to us that it is important not to decorrelate the choice of the model from the data available to calibrate both models and shocks. There are two dimensions for parameter uncertainty and model risk.	

	The first dimension relates to the concept that parameters are not eternal constants, but typically vary over time. This is implicit in the historical period over which a trend is fitted / the weighting scheme used in the estimation. If there were no parameter uncertainty, one would use the longest historical period, with equal weights for all observations. In practice, using a fixed rolling window, of, say, 40 years, is a pragmatic way to handle a slow moving longevity trend. The most straight forward way to obtain information on the amount of parameter uncertainty and/or model risk is to analyse what happened when re-estimating BE's annually using a rolling, say, 40-yr window, i.e. back testing. Richard Plat has performed such an analysis [« One-year Value-at-Risk for longevity and mortality », Insurance: Mathematics and Economics 49 (2011) 462–470)] and he arrived at longevity risks that are similar to the current SF. The second dimension relates to volatile parameter estimates, arising from a limited number of observations with error terms. Bootstrapping can help quantify this risk. E.g. by sampling model parameters from an assumed normal distribution. The normal distribution could be based on the standard errors of the parameters of the Lee-Carter time series. Please refer to a master thesis by David Plomp which provides an algorithm [http://repository.tudelft.nl/islandora/object/uuid:967a648a-29df-47d9-a02c-ac5c2d0a2416?collection=research]	
Q10.3	Yes. (see also 10.1) But this should be done in a framework of calibration of ORSA shocks, where it is possible to: ➢ Perform sensitivity tests about the future evolution of the trend ➢ Take into account expert opinions ➢ Use methods of detection of trend breaks (high level approach) Depending on the structure of the portfolio a material level of expert judgement will be unavoidable. (deferred annuities, direct annuities, pension business, socio-demographic structure,… might cause different effects) Following our earlier response to Q10.1, the stress parameters should be judged for their biological reasonableness by evaluating the impact of several scenario's (e.g. cure for cancer, growing obesity). These scenarios should not be the input on which to calibrate the stress parameters, but rather be a tool to validate the used model. Otherwise one would use expert judgment to model the possible deviation from an expert judgement based best estimate mortality trend.	

Q10.4	Be careful with the HMD data (Human Mortality Database) which might be incomplete according to some researchers. The important point here is to conduct actions among the EU Members to make the data collected by state agencies available (for example INSEE **in France** could give access to mortality data). **In Germany** the general source of mortality data is the “Statistisches Bundesamt” (Destatis, https://www.destatis.de/EN/Homepage.html;jsessionid=EB391066F94D6403C4F09A219F80EE70.cae1) and the data there is publicly available. Another source of longevity data could be German social pension fund. This data is not released to the public but we believe that it will be available on request from official authorities like EIOPA. (Both data bases together with data from reinsurance companies were used to calibrate the German DAV mortality tables for annuities). Generally, portfolio data should be used when modelling mortality or longevity risk given a certain data quality. This means policy data should be used, which are not publicly available and might differ a lot between companies. When using a multi-year model, HMD and EuroStat might provide useful information.	
Q10.5	Two approaches seem theoretically possible: ➢ The first one consists in positioning (with parametric or non-parametric methods) the insured mortality with respect to a national table (calibrated with the model chosen). Caveat: Insured mortality might differ for particular homogeneous risk groups! ➢ The second one uses a credibility approach after calibrating the national table with the model chosen Considering size and complexity of portfolios a) For the risk factors in the standard formula we would not take account of differences between general and insured mortality. For the calibration of a 99.5% quantile we don’t believe that the available data for insured mortality is statistically relevant for all undertakings. But for best estimate assumptions differences between general and insured mortality should be accounted	

	for. This is already common practice e.g. in Germany. Furthermore, insured data are not publicly available and it is not possible to define a representative portfolio suitable for all European insurers using the Standard Formula approach. b) Same answer as a) Both comments are obviously targeted at standard formula users. Differences between general and insured mortality should be taken into account as the insured subpopulation might have very different mortality characteristics. Differences could be accounted for by separately modelling portfolio mortality and experience factors (being the proportion between insured and population mortality). The insured mortality (which is the one that really matters, after all) can then be obtained by multiplying population mortality with experience factors. Portfolio risk characteristics with respect to level, trend and volatility could be based on the process and parameter uncertainty in the stochastic model that is used to forecast experience factors.	
Q10.6	An approach with a non-uniform shock, especially for longevity risk a different stress for each age, would be more appropriate. Such an approach would increase the complexity of the calculation significantly. Higher granularity will also lead to a decrease of volume and quality of the available data bases. Higher granularity should be reflected in the best estimate liability to better reflect the sub-portfolio dependant risk. Yes, from an actuarial point of view this would be more appropriate as different products can have different mortality characteristics. Benefits: - This would enable a better allocation of capital to product groups. This could be particularly important for SCR projections in the Risk Margin (as they require projecting risks over an ever older population). To the extent that there is a ‘wall of death’, longevity improvements at older ages faces limitations.	

	- It improves consistency between assessing risks for mortality products and assessing risks for longevity products. Costs - The costs would be a more complex model as stress factors have to be determined on a portfolio level. This could partly be solved by distinguishing between a generic population mortality module and an undertaking specific portfolio mortality module. - Further additional complexity and model risk is introduced by the need for specifying the aggregation structure of the capitals of different product groups. We propose an approach according to which the uniform shock would be reviewed for example with regard to the average age of insured portfolios (see also 10.1)	
Q10.7	We do not think that the risk factors have a higher quality if they are calibrated on a representative portfolio for all European insurers rather than from a stochastic mortality model.	
Q10.8	For longevity risk, a model point approach could be adequate. The model points should then represent a model portfolio that represents for instance, in a condensed data format, insurance liabilities per age, gender and product type of the specific insurance portfolio. In that case, the model portfolio adequately reflects the longevity dynamics of that total insurance book. Especially annuity contracts differ considerably between countries and even between undertakings. Contract Law, Tax Law and Social Law have to be considered as well. Some differences (not conclusive): - With profit – no profit participation - Male, female, unisex mortality - Age bands - Socio-demographic structure (workers, civil servants, self-employed…) - Deferred annuities with lump sum option at end of deferment period - Deferred annuities without such option	

	- Regular premium payment, single premium - Pension business (in life insurance undertakings) - Private annuities - Government-funded products All of these differentiating features have perhaps their specific impact on the risk exposure. A portfolio split would impact drastically the volume and quality of data needed for the calibration of stresses.	
Q10.9	No. As a consequence of the long-term nature of annuity business an interest rate sensitivity seems not avoidable for most of the portfolio. Low interest rate environment in capital markets will impact the capability to pay future annuities. Loss absorbing capacity in case of with-profit business, policyholder behaviour at end of deferment period have to be considered as variables with considerable impact. An idea might be to have an adjustment on the SCR to account for this. This adjustment might be positive (higher SCR) in case a company is sensitive to interest down and vice versa. The size of this adjustment should depend on the level of the correlation between interest risk and mortality risk. However the actual specification of such a mechanism is very tedious.	
Q10.10	See 10.1 and 10.6 As uncertainty accumulates over time, a shock that grows with future years better represents the nature of longevity/ mortality risk: drivers of changes in mortality rates are expected to slowly manifest themselves. One way to do that is to explicitly shock a mortality trend parameter.	
Q11.1	According to our understanding of the discussion paper, Q.11.1 concerning the introduction of USP for biometric risks echoes Q.10.5. As the calibration of a mortality model requires a large population and many years of observations, most insurers are unlikely to be able to calibrate a mortality model on their own portfolio. Actually, this is also true for the majority of large insurance companies which use for their internal model HMD or equivalent data to calibrate ***Trend Risk* and *Volatility Risk***.	

As a consequence we believe that the stress corresponding to these two components should be provided by the local authorities in a USP framework (by country).

These stresses might be defined as proposed in Section 10, *e.g.* by using a stochastic mortality model to integrate the evolution of mortality in a probabilistic framework which would allow one to derive the 1Y-Volatility Risk as well as the Automatic Recalibration Trend Risk. *Trend Risk* should not only take into account the recalibration of the mortality trend after having simulated an additional piece of data using the fitted stochastic mortality model. It should also gather the Model Risk (or model error) as well as the Non Automatic Trend Risk and the Basis Risk. Non Automatic Trend Risk aims at taking into account the fact that an insurance company might; using external data provided by national or international organizations specialized in mortality issues, make adjustments to the statistically determined mortality trend. This risk is not easy to integrate in a 1Y-VaR SII’s framework to the extent that disruptive information relative to mortality is unlikely to be updated every year. Basis Risk is also to include in the *Trend Risk*, and might be considered and analysed using relational models. A statistically robust estimation of this risk is complicated and the authorities should suggest a prudent stress. Finally, Model Risk could be estimated using the principles of the following approach. Consider several mortality models which are different such as Lee-Carter, CBD family models, P-splines models, etc.… and evaluate the relevance of each model on reference data using a statistical criterion such as BIC. Then, conduct the analysis for the different mortality models. Model Risk could be determined using a measure of heterogeneity between the calibrated stresses that one can get using the 2/3/4 most appropriate mortality models –*e.g.* if the model one was removed, how would the calibrated stress be impacted? On these risks, the authorities should determine general and prudent parameters for USP as these parameters are not easy to evaluate correctly.

Level Risk is a different matter to the extent it depends on the size of the insured portfolio. In a USP context, insurance companies should have the possibility to make their own assessment of *Level Risk* which should take into account the limited size of the portfolio (and thus the associated volatility in the estimation of the current mortality rates) as well as every risk in the retreatment of the data used for the BEL calculation. At this point, we do not propose a formal description of the methodology that one should use in the USP context for assessing its own *Level Risk*.

Finally, *Volatility Risk*, *Trend Risk* and *Level Risk* could be aggregated using the following formula:

	$\text{Global Risk} = \sqrt{(\text{Volatility Risk})^2 + (\text{Trend Risk})^2 + (\text{Level Risk})^2}$ assuming a zero-correlation between the three components of risk mentioned above. One should note that, especially for longevity issues, *Trend Risk* and *Volatility Ris*k represent a very important part of the global longevity risk. Then, at least concerning longevity issues, the degree of freedom granted to USP users would be moderate.	
Q11.2	We regard some standard parameters of the Standard Formula as potential candidates for additional USPs. We admit that the introduction of additional USP would not meet the short term objective of simplification set for the ongoing SCR review by EIOPA, but we would be happy to support future related research and development work on the matters stated below. **Non-Life Natural catastrophe risk sub-module** The following standard parameters from the Non-Life Natural catastrophe risk sub-module could be replaced by the parameters specific to the undertaking • Q(windstorm,r): windstorm risk factor for region r as set out in Annex V • W(windstorm,r,i): risk weight for windstorm risk in risk zone i of region r set out in Annex X • Q(earthquake,r): earthquake risk factor for region r as set out in Annex VI • W(earthquake,r,i): risk weight for earthquake risk in risk zone i of region r set out in Annex X • Q(flood,r): flood risk factor for region r as set out in Annex VII • W(flood,r,i): risk weight for flood risk in risk zone i of region r set out in Annex X • Q(hail,r): hail risk factor for region r as set out in Annex VIII • W(hail,r,i): risk weight for hail risk in risk zone i of region r set out in Annex X These parameters determine the solvency capital requirement per zone i of region r as a percentage of the total sum insured. Specific portfolio characteristics (vulnerability to natural catastrophe events, precise location, treaty conditions and exclusions) are not taken into account. When buying reinsurance cover, often event loss tables are generated by the undertaking based on detailed portfolio information which provide information on the 1 in 200	

year loss. The ratio of this 1 in 200 year loss and the total sum insured could be used to determine the above parameters specific to the undertaking.

Premium- and reserve risk , correlation between segments

On calculation of the premium- and reserve risk using the standard formula, the correlation between the segments is assumed to be fixed by a given matrix (see appendix IV of EU directive 2015/35, every correlation amounts at least 25%). The correlations given by this matrix apply to both premium and reserve risk, where premium and reserve risk themselves are correlated by 50%.

On the other hand, several analysis of claims development indicate that the reserve risk might actually be independent between the segments. So it is suggested to allow to replace the correlations by USPs, separate for the premium and for the reserve risk.

For a single undertaking the available data might not be sufficient to produce a reliable estimation of the “real” own correlation. So it is also suggested to launch a project (i.e. by the AAE) for researching the segment interdependencies in premium- and reserve risk and for providing a guide to the undertakings to derive own USPs for those correlations.

Life Lapse risk submodule

First Comment: Permanent increase/decrease in lapse risk

Current Approach according to EIOPA-14-322 “The underlying assumptions in the standard formula for the Solvency Capital Requirement calculation”

- In the current approach for lapse risk the calibration of the shock of the decrease of lapse rates was based on a study of the UK with-profit life insurance market in 2003 performed by order of the British FSA.
- The shock of the increase of lapse rates has been assumed to be symmetrical.
- The empirical basis to calibrate the mass lapse has been described as scarce.

Impact of lapse risk

Generally speaking, lapse risk is one of the major underwriting risks in life insurance especially if surrender values are guaranteed. The German supervisory report published in 2016 analysing day one reporting shows that prior to diversification life risk makes up 29% of the BSCR requirement, the second most important risk after market risk (78% of BSCR). QIS5 data reveals for a market with guaranteed surrender values that lapse risk drives the life risk module even stronger than longevity risk (43% of life risk is attributed to lapse and just 40% to longevity on the German market).

In addition, lapse risk has a high impact on the time value of financial options and guarantees. Finally, lapse rates are of particular significance for business models with guaranteed surrender values. Here, a precise reflection of risk is needed in contrast to business models where surrender values reflect current market conditions or do not contain any guarantees.

Data quality

Insurance undertakings in general perform analysis on specific parameters which impact their risk profile and contribute to solvency capital requirements materially. One of these parameters is lapse. Especially, undertakings can differentiate between lapse rates by product line. Furthermore additional differentiations are often possible: time to maturity or elapsed time since issuance as well as other determining parameters e.g. sales channel and such. Time series exist over longer time periods, so that undertakings can monitor on the one hand the trend in lapse behaviour, on the other this also allows for quantile analysis over time. Of course, size and complexity of the insurer needs to be taken into account by principle of proportionality. However, data should be readily available, since under local GAAP accounting procedures information has been disclosed for well over 40 years. Time series analysis can thus perform USP calculation. Naturally, data quality has to be checked and proven by the Actuarial Function in line with other data quality issues and is of course subject to further checks by auditors and supervisors.

Lapse rates in the German market

The lapse rates in the German market vary widely. We can identify the following main drivers

- Product mix, since e.g. savings business often has a higher lapse experience than protection business
- Sales channels
- Maturity of the inforce business

The heterogeneous picture with regard to lapse rates is confirmed by data from the German BaFin which contains quantiles of relative lapse rates and shows a high volatility in time and among companies:

	2011	**2012**	**2013**	**2014**	**2015**
95% quantile	8.33%	7.68%	7.64%	7.42%	6.94%
75% quantile	5.48%	5.27%	5.19%	4.77%	4.61%
median	4.18%	4.11%	4.01%	3.78%	3.39%
mean	4.70%	4.53%	4.47%	4.10%	3.76%
25% quantile	3.39%	3.33%	3.39%	2.95%	2.70%
5% quantile	1.93%	1.84%	1.80%	1.77%	1.63%

In addition, with general market data available (1975 – 2014) quantiles have been evaluated to review lapse up and down shock. Data shows quantiles of 99.5% at 10.59% and 0.5% at -11.38%. From our perspective this indicates that shock parameters currently used in the standard formula might be too high and after a reduction stress would still reflect the risk adequately.

Overall Solvency Needs

Assessing the overall solvency needs life insurance companies calibrate the lapse risk according to their specific risk profile. Market experience tells us that the company specific calibrated lapse risk is usually much lower than the one used in the standard formula. We would like to recommend a formal check of this claim by EIOPA.

Conclusion

Given

- the substantial impact of lapse risk in the European life insurance market,
- the highly company specific characteristics in terms of lapse level and volatility in e.g. Germany,
- the experience companies gained calibrating lapse risk when calculating the overall solvency needs and
- the results of the overall solvency needs calculation that suggest that the parameters of the standard formula do not necessarily fit

We suggest to introduce the possibility of USP for lapse risk.

Second Comment: Mass Lapse

We failed to confirm the parameters for lapse risk checking and validating them with market data.

	Mass lapse may be subject to primary business model. If life insurance is focused on long-term protection similar to pension schemes, mass lapse is directly linked to biometric components and consumer bonding to insurer. Even in the actually occurred event of an insolvency of a German life insurer which was then handed over to a protection fund, lapse rates did not exceed 20%. This corresponds to observations in health insurance, where mass lapse has been evaluated empirically using lognormal distributions. On the 99.5%-quantile of these data a 200 year event has been calculated with 20%. From our perspective mass lapse could well be captured with 25% stress.	
Q11.3	**First Comment: Permanent increase/decrease in lapse risk** We consider data concerning lapses as readily available and of very good quality, as lapse and lapse risk are usually subject to a close monitoring in life and health insurance. **Input data and method-specific data requirements** The data for carrying out the undertaking-specific stress calibration shall consist of the following: a) data consist of number of lapses and number of total policies differentiated by line of business and elapsed time/maturity of the contract; b) the data are representative for the lapse risk that the insurance or reinsurance undertaking is exposed to; c) the data are adjusted for any mass lapse occurrences or outliers to the extent that these risks are reflected in the mass lapse risk; d) data are available for at least five reporting years; **Method specification** In order to calculate the USP for lapse risk we would recommend to use the following method for each line of business: a) Clustering of raw data with regard to the maturity of the contracts. One cluster may contain more than one maturity. Carry out this step for at least 5 years. b) Calculate the lapse rate for each maturity bucket where the lapse rate is given as number of lapses over number	

	of average business in force. c) Calculate the change in lapse rate for each bucket as lapse rate of year (t) over lapse rate of year (t-1) and subtract 1. d) Assume a normal distribution for the change in lapse rates and fit the parameters by calculating the empirical mean and empirical standard deviation. e) Validate the fitted distribution using a statistical test like the Q-Q-plot. Calculate the 0.05% and 99.5% quantile. For the disability / morbidity risk, considering the nature of the risk, a similar approach to the one retained for the mortality and longevity risks could be applied. For the lapse risk, one could calculate the undertaking's historical lapse rates and its volatility. By considering for example that the lapse rates follow a normal distribution, one could then obtain its mean and variance and deduce the appropriate quantile. For this particular risk, one can consider that the 99.5th percentile lapse rate levels are in general suited to calculate the 99.5th percentile of the distribution of the respective liabilities. In the specific case of the premium risk, the data criteria could be improved by integrating the trends for the calculation of the USP factors to avoid the impact of long term trends over the volatility of the premium risk factor.	
Q11.4	The data requirements in ANNEX XVII.B.2.(g) are not consistent with or not relevant for the calculation of the USP, as the checked variables (aggregated loss) are not directly used in the formulas.	
Q11.5	The current non-proportional reinsurance factor USP method is easy to calculate, but almost not risk-sensitive at all. **Suggestion:** Split the non-proportional property reinsurance into a) non-proportional reinsurance covering natural catastrophes (windstorm, earthquake, flood, hail, subsidence; I.E. Cat-XL per event) b) non-proportional reinsurance covering other accumulated losses of many single claims (I.E. aggregate XL or stop-loss) c) non-proportional reinsurance covering large single risks (XL per risk)	
Q11.6		
Q11.7	Other than the issues common to the USP framework (methodology and formula imposed by EIOPA, data criteria),	

	the main difficulty related to the application of GSP is to demonstrate that the nature of the group business and its risk profile are similar enough to those of the individual undertakings providing the data	
Q11.8	An alternative method could be to calculate USPs at an entity level and then allow an aggregation of these USPs to obtain the GSP. EIOPA should give guidelines on the aggregation method.	
Q11.9	We have not identified a risk on which specific parameters could be applied only at the group level and not at the solo level.	
Q12.1		
Q12.2		
Q12.3	**Counterparty Default Risk: Overdue Premiums** There is some ambiguity about what is meant by the premium “due date” when calculating counterparty default risk on overdue premiums. The ambiguity arises where premiums are collected by an intermediary and later remitted to the insurer. The question is what the “due date” of the premium is: is it the date the premium is paid by the customer to the intermediary, or the date the intermediary is due to pass it on to the insurer. If the latter date is used, then there is arguably a credit risk that is not captured by the Standard Formula. There is also the possibility for insurers who use fellow group companies as intermediaries to game the system by allowing the intermediary to hold onto premiums for an extended period: effectively an inter-group loan which attracts no credit risk in the Standard Formula **Counterparty Default Risk: Premium receivables from rated counterparties** These are “policyholder debtors” and as such are designated as Type 2 exposures under item 3(b) of Article 189 of the Delegated Acts. However, where these are rated corporates they have all the characteristics of Type 1 exposures. We would suggest that the appropriate treatment is Type 1, (analogous to the treatment of lines of business reflecting the underlying risk as per Article 55 of the Delegated Acts). A particular subset of this scenario is reinsurance premium receivable from reinsurance cedants; these are at the same time Type 1 under item 2(a) of Article 189 of the Delegated Acts and Type 2 under item 3(b) of Article 189 of the Delegated Acts.	

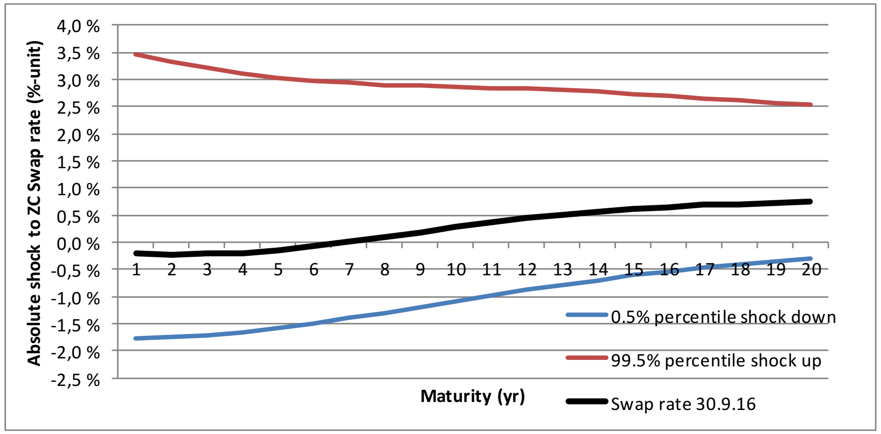
Q12.4	- Article 197 considering Risk-adjusted value of collateral: too complex for standard cases as reinsurance exposures or derivatives. - Article 192: reference to 60 % or more of the counterparty's assets subject to collateral arrangements requires additional information and regular assessment not easy to get. Cash at bank exposures: within clearing process, the final counterparty is not necessarily known. Additional processes costs should be spent to get information, getting poor information for SCR calculation. **Counterparty Default Risk: Complexity** The calculation of counterparty default risk is particularly complex and more so when considering collateral arrangements e.g. F factors; Allowance to the extent to which collateral covers risk exposure (what is the definition of “risk exposure”); how do you calculate NL underwriting risk assuming collateral is at a level to give partial credit for RI arrangements. See also Q2.1	
Q12.5	- Article 197 : - Counterparty requirement and third party requirement should be always considered met for standard contracts or arrangements when counterparties’ rating is above a fixed credit quality step (e.g. CQS 3). This feature should be taken into account through the external rating process. - Market risk adjustment value of collateral: option should be given to undertakings to compute on a discount-factor basis, as the 15% factor introduced by article 112, without any reference to proportionality principle. The assessment of market SCR decrease due to the arrangement implies costly additional analysis and process’s complexification. - Article 192: reference to 60 % or more of the counterparty's assets subject to collateral arrangements should be always met for reinsurance LGD calculation, when reinsurer’s rating is above a fixed credit quality step (CQS 3). This feature should be taken into account through the external rating process. - Cash at bank exposures: option would be given to undertakings to use a standard risk weight treated as a third type of exposures, regardless bank’s rating (e.g.: 2%).	
Q12.6	The module presents a substantial unjustified work /importance of the module	

Q12.7	If you don't comply with criteria → ORSA	
Q13.1		
Q13.2		
Q13.3		
Q13.4		
Q13.5		
Q13.6		
Q14.1	**Market Risk: Treatment of Term Deposits** Term deposits, even short-dated term deposits, are to be treated under Market Risk rather than Counterparty Default Risk. However, the market value of term deposits does not move with movements in interest rates or spreads in the same way that corporate bonds, even corporate bonds issues by the same deposit holding institution, do.	
Q14.2	Some single names exposure could include both insurance undertakings, credit institutions, financial institutions and others. Consequently the application of article 186 needs clarification. One solution could be to include the specific treatment allowed for undertakings fulfilling the conditions of article 186 more specifically in the article 182(5). Article 182(5) details the expected treatment for exposures related to a same one single name which have no credit rating assessment. In such a case, the default credit quality step 5 to be affected should be adjusted by EIOPA to induce a gi coefficient consistent with the one currently defined in article 186. See also Q2.1	
Q14.3		
Q14.4	Article 199 exhibits the same issue as the one mentioned above. One way to deal with this issue could be to split each multi-activity single name exposure into some single-activity exposures before the treatment.	
Q14.5		
Q14.6		
Q14.7		

Q14.8		
Q14.9	No	
Q14.10		
Q14.11		
Q14.12		
Q15.1	It is a risk as one cannot pay for instance EUR liabilities with USD assets without someone doing a currency transaction. Anyway the 'real' risk still seems to be an excess in one currency being worth less when needed to cover a stress which is denominated in a different currency. But as explained in the consultation paper there is a risk of wrong information flowing from the SCR results expressed in a single reporting currency (which might be neither of the currencies in question).	
Q15.2	The solvency assessment needs to reflect any potential significant movement in the amount of surplus assets compared to stresses due to movement in pairwise exchange rates.	
Q15.3	We presume this question is to be interpreted purely in a currency sense. Yes, currency risk can cause lack of fungibility and capital controls can be imposed if a currency is at risk. To the extent that this risk arises from lots of profitable companies that want to take out their money, there could be a risk. Just as in Greece, if Italy follows up on recent suggestions to get out of the Euro, non-Italian groups may run into difficulties when getting Euro's out of Italy. In the case of Italy, however, people take out their money not because the banks are so profitable, but because they are perceived to be risky, and need cash inflows. This limits the problem. Anyway If it is a component of the SCR which can lead to an over-assessment of the SCR as mentioned in Q15.1 it should not impact the assessment of the fungible own funds.	
Q15.4	More or less yes, but it should be taken into account that : • The 'misreporting' through the reporting currency can result in over or underestimation of adequacy of assets. • A scenario driven approach to SCR allows the material scenarios to include adverse currency movements applied to the assets and stress amounts arising according to their underlying currency. • the solo currency SCR might be overestimated because : - it is assessed without considering any diversification effect between the different currencies - The calibration of the currency risk realised by CEIOPS for the standard formula derives from a	

	calculation of Value-At-Risk (VaR) for each currency of the market global currency exposure benchmark. The currency standard formula stress coefficient results from the weighted average of these VaR instead of a unique VaR calculated from a composite index representing the market currency benchmark. We have not identified how to improve on the existing standard formula.	
Q16.1		
Q16.2		
Q16.3		
Q16.4		
Q16.5		
Q16.6		
Q16.7		
Q16.8		
Q16.9		
Q17.1	Yes we do. Especially it needs to be taken into account that: • The goal of measuring the one-year 99.5% VaR in the low yield environment with even negative interest rates can obviously not be achieved by the relative downward shock prescribed in the Delegated Regulation. Basis for the definition of the shock parameters have been time series for Euro and GBP until 2009. Very low interest rates and even negative interest rates are unprecedented and had not occurred at that time. • This relative approach becomes meaningless in an environment, where very low and even negative interest-rates are prevailing: ○ Risk of interest-rates becoming negative not adequately captured. E.g. for still positive but very low interest-rates the risk of interest rates becoming negative is not captured. ○ The basic risk-free interest rate being negative shall not decrease further (Article 167(2) of Delegated regulation). • As depicted in the discussion paper (p. 62) a recalibration by considering the development of these currencies in the years 2009 – 2016 would lead to erratic behaviour of the upward shock. A different approach is needed. • Approaches discussed in the following are	

	○ Extension of the time series (backtesting with longer history) ○ Introducing an additive component (minimum shock also for the interest rate down risk) ○ Keeping the relative shock approach determined by using shifted curves	
Q17.2	We find defining a minimum downward shock problematic as there is several aspects that needs to be taken into account. Also because of the many different aspects we encourage EIOPA to further investigate the matter quite carefully. Regarding the minimum shock we find that: ● There is no reliable estimation of a lower bound available. ● In April 2016 IMF has indicated (“ballpark estimates”) maximum negative interest rates in a range of -0.75% - -2% (https://blog-imfdirect.imf.org/2016/04/10/the-broader-view-the-positive-effects-of-negative-nominal-interest-rates/). Based on these IMF estimates, it seems reasonable to maintain a 1% minimum downward shock on short rates for now (ignoring significant changes in perception). Even if recent history suggests that shocks can be higher, it could be argued that these results are politically influenced or driven. The QE program of ECB or FED leads to considerable distortion of the capital markets. These developments are unprecedented and cannot be observed in the past. ● A 1%-point change might not be realistic for longer maturities. Historically, short rates were more volatile than long rates (if you consider absolute %-points change). This may suggest that minimum rate changes at the longer end could be smaller. But this may not be prudent. The lower historical absolute volatility of long rates presumably arose because long rates were market driven – at least for duration below LLP- and based on a mean-reversion picture of short rates (and a risk premium). In the current QE environment, central banks directly impact long rates as well. This creates an additional source of volatility for long rates. To the extent that long rates are unlikely to move beyond the lowest short rates, this creates additional downside risk for long rates. ● With long maturities (longer than LLP) it should also be taken into account the specific structure of the relevant risk-free interest rate curve. The UFR reflects a final ultimate rate that could – as currently suggested by EIOPA– change its value due to changes in the components that make up the UFR value itself. Stress however, could not change the concept of a final ultimate rate more than the method implies itself for a period of 12 months (so the suggested annual maximum change by derivation method). ● It seems appealing to maintain the same absolute upward and downward shock, as long as the max (up,	

	down') framework is used. Both need to be equally credible, also when risks are 'scaled' down / viewed from a difference confidence angle. • This could lead to some technical issues for example in application that uses forward rates for valuation purposes. • Internal interest rate models (real world ESG's, Fig. below) show a different volatility for different maturities and based on current data quite high volatility surface (which can also change in future). Minimum shock could be calibrated to actual 99.5% percentile annual shock in long historical data or by parametric method through estimation of interest rate volatility. •  **Example of an internal interest rate simulation (real world) model calibrated to 30.9.2016 zero coupon swap rate curve. 12 months risk horizon.**	
Q17.3	In addition to the discussion on absolute or relative shock a static shock independent from observed interest rate level seems questionable. E.g. we do see restrictions with respect to strongly negative interest rates beyond a certain boundary. It can be argued that in fact there will be a certain limit on negative rates, i.e. related to cash related costs which will prevent investors from investing in bonds with negative coupon thus giving rationale to arbitrage within a model if no lower limit were introduced. Assuming such a floor this lower boundary could be under surveillance of	

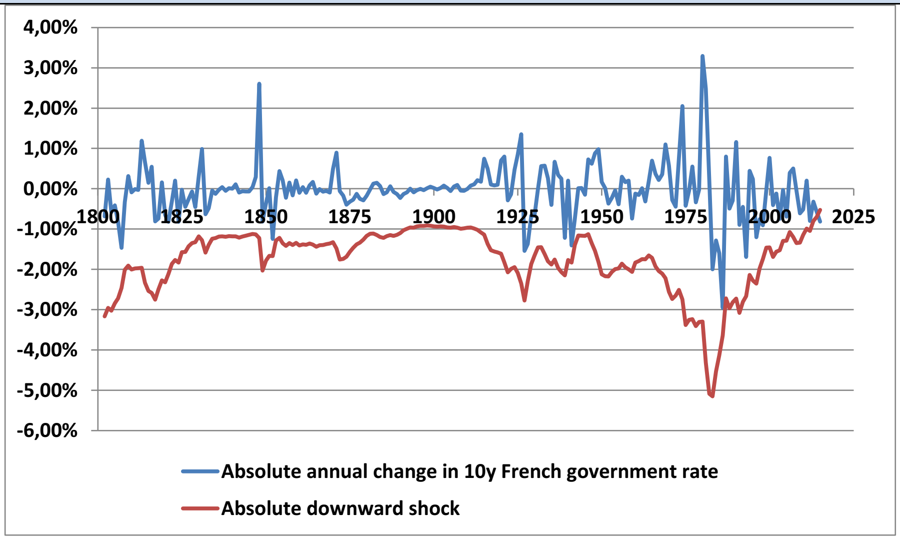
EIOPA and thus suspect to future amendments or changes concerning the actual boundary value in future years evaluating past market realisations of this negative interest rate limit.

Also one should consider to calibrate shocks dependent upon term. Here, the stress could diminish in the long term structure of the curve since eventually the curve depends on the UFR rather than real observed prices / values. So stresses in the extrapolation zone of the curve should tend to impact the curve much less since the UFR reflects a final ultimate rate that could – as currently suggested – change its value due to changes in the components that make up the UFR value itself. Stress however, could not change the concept of a final ultimate rate more than the method implies itself for a period of 12 months (so the suggested annual maximum change by derivation method).

The issues around the interest-rate risk might need to be solved not only via the interest rate risk calibration but also more widely via the actual interest rate and how it effects the SII balance sheet. Below listed points to consider here:

1. Regarding the question on absolute or relative shock a static shock independent from observed interest rate level seems questionable. E.g. are there restrictions with respect to strongly negative interest rates beyond a certain boundary? It can be argued that in fact there will be a certain limit on negative rates, i.e. related to cash related cost which will prevent investors from investing in bonds with negative coupon thus giving rationale to arbitrage within model if no lower limit were introduced. Assuming such a floor this lower boundary could be under surveillance of EIOPA and thus suspect to future amendments or changes concerning the actual boundary value in future years evaluating past market realisations of this negative interest rate limit. Regardless of how such a limit might be derived, it seems evident that in a negative environment, rates might drop a little further but not as much as if rates were to be found in a positive environment. To illustrate the idea, the chances of a ten-year-gov't bond at -0.5% to drop to, say -0.6% may be fairly high, but likely to be close to zero to drop by 200 BP to -2.5% whereas the same bond yielding at +5.0% might with quite likely experience a drop by 200 BP to 3.0%. So, the shock applied should obviously reflect market conditions.
2. Artificial elements (UFR, VA, CRA) in the liability valuation are applied to the valuation of unit-linked liabilities. This can distort analysis of interest-rate risks.
3. The Smith-Wilson extrapolation procedure used implies extreme interest-rate sensitivity around the LLP. Cardano proposed a smoother extrapolation mechanism that doesn't suffer from these problems (« *Dangerous design flaws in the Ultimate Forward Rate: The impact on risk, stakeholders and hedging costs*”

	Theo Kocken, Bart Olden Kamp and Jeri Potters; *Working paper, 13 July 2012).* 4. Valuation models (of liabilities and/or swaptions) that include interest-rate volatility will specify some kind of dependency of absolute *and/or* relative interest-rate volatility on interest rates. Different approaches lead to different interest-rate risks, likely creating risk of inconsistencies within and/or across insurance companies. It may be useful to explicitly specify that in the calculations either absolute or relative interest-rate volatility is to remain constant. For some insurers the main interest rate risk seems to be the speed of unexpected variations in interest rates and when considering low interest rates situations, the length of these stressed periods, not the severity of interest rates variations.	
Q17.4	It seems reasonable to use a data set composed with historical EIOPA smoothed curves as proposed by EIOPA. Anyway this data set should be deep enough to insure a reliable risk assessment (see above). When investigating the current data it should be taken into account how the current economy works and how this might affect future interest rate changes. For the future work on the data the following should be considered: • As the backtesting presented covers only a relatively short time period, it should be tested how sensitive the results react when a longer history is considered. The availability of reliable data is required. • Example: The following backtesting is built with more than 200 years of historical data of 10y French government bond rates and is equivalent to the figure presented by EIOPA but with only considering yearly data: we observe that there is only one year violation in the overall period.	



For the Netherlands, series of 200 years are available (https://www.cbs.nl/NR/rdonlyres/7934A2DE-B87C-4CDF-8BC7-D34F02225620/0/200jaarstattijdreeksen.pdf).

- This should give additional comfort regarding the calibration of annual absolute %-changes in interest rates. To the extent that we now operate in the “far tail” of interest-rate levels, we probably need to be modest in our claim to accuracy. Given the low interest-rate environment, it makes sense to use a calibration that weighs in Japanese / Swiss interest-rate developments and not have completely different interest rate risks for each market.

Q17.5

We understand the (**) – approach and the inputs as follows:

- ‘Political ingredients’ (CRA, UFR, MA and VA) remain unchanged as interest rate inputs change.
- Taken literately, the ** approach could be interpreted as the use of liquid par swap rates as input. We are happy with the current approach to consider ‘swap spot rates’ as ‘input’.

Having this, we agree with the (**) - approach, focusing on the input side, for the following reasons:

- Interest-rate risks on the input side can be managed directly.

	- External parties are interested in exposure to the input side. - If the output curves (e.g. the extrapolation) are shocked, it is not clear what this should imply for the inputs. Should only the input be shocked (leaving the ‘political framework’ unchanged)? Or should the ‘political framework’ also be shocked? And vice versa, if the inputs are shocked, the consequences for the output follows quite naturally from the input/output logic. There is no natural reason / or way to change the ‘political framework’. Indeed, the current change in the UFR level in the SF is hard to interpret / manage. - The difference between input and output is a political ingredient that cannot be managed. If the input is smooth, and the output not, it should be resolved politically. - See also the Cardano paper quoted above in the answers. - Data used to perform calibration on interest rate risk should only include data up to the last liquid point but not beyond. The concept of LLP was introduced mainly because data beyond that point was statistically unsound and scarce data would have led to erratic behaviour of the curve. These issues would lead to less reliant stress calibration if data beyond the LLP were used accordingly. If for some reason the LLP was to be changed in future then the historic data used in the calibration should be also reassessed.	
Q17.6	No special view on data used. However it might be investigated how to include implied swaption volatilities as input and what improvement this could give	
Q17.7	Yes, we believe it might be. Especially if it was not possible to build a data set composed of historical EIOPA smoothed curves (see Q17.4). In such case, an alternative method which assumes reduced stresses for the rates over the last liquid point should be applied. Shock on input data and not on curve.	
Q17.8	Calibration should be performed with considering a deeper data set as mentioned in 17.1 to avoid a rise of volatility in the SCR assessment due to potential calibration modifications.	
Q17.9	We believe so but it should be taken into account that: - Principal components primarily serves to smooth the outcome of the shocks. This can also achieved by smoothed methods.	

	- Principal component analysis (PCA) is regarded as standard tool for dealing with high-dimensional and potentially highly correlated data and results in statistically meaningful and yet sensibly shaped interest rate yield curves in stresses. Therefore, clear support for applying a PCA here.	
Q17.10	We would propose monthly or quarterly data for reasons listed below. But we do also find several good arguments for the use of shorter or longer data which we share below: - The use of longer data most closely links in to the stated objective. The use of shorter data will require the validation of an independence assumption. - Scaling of shorter time volatility into annual shock could be problematic, e.g. basic sqrt (T) scaling might not work well in all circumstances. - As it is difficult to obtain a deep historical data set composed of annual interest rate curves shorter time-window should be used. By using quarterly data it might be easier to avoid excessive auto-correlations which could give rise to a potential misfit of the interest rate risk. EIOPA should also consider to work on building a deeper data set (see Q17.1) - One should carefully note, that in choosing the data frequency (annually, quarterly, monthly, weekly or daily) one has to find the right balance between two opposed effects: • On the one hand choosing a high frequency (e.g. daily data) provides a broader data base and hence a statistically more robust estimate for the resulting volatilities (or similar quantities under consideration). • On the other hand high-frequency data are typically accompanied by rather high autocorrelations which again makes it harder to derive annualized volatilities (or similar quantities under consideration) from, say, daily ones. It is recommendable to analyse the data chosen with regard to inherent autocorrelations in order to avoid over- or underestimation of the annualized quantities.	
Q17.11	We would expect this to be an improvement of the current method. In current low rate regime constant absolute shock might work better but with very high interest rates one would expect absolute shocks to increase (b>0). Fitting the parameters a and b to actual data is naturally required. Also an affine form seems to fit in well with a 'normal distribution' of interest-rates at low interest levels, and a 'lognormal distribution' at higher interest rates. Putting a minimum shock serves pretty much the same purpose. Perhaps quantifying the affine norm could facilitate	

	calibration.	
Q17.12	We see that the methodology for fitting a and b would need to be further documented before commenting more. It could be taken into account that an affine curve has an 'angle' that could be hard to calibrate (even though it is not that critical). A smoother curve would seem nicer, but without much additional justification.	
Q17.13	This seems to be very close to constant absolute shock method or additive method with b=0. This would better reflect risk than current method but additive method would be preferred. The lack of an explicit time dimension in the intensity approach ('what is '1') makes it hard to interpret.	
Q17.14		
Q17.15	We have already covered part of this in 17.3 but we would like to introduce a Shifted log-normal model for EIOPA to consider (below). Also we see that instead of absolute or relative stress, term as a parameter should be introduced to the calibration concept. Here, stress could diminish in the long term structure of the curve since eventually the curve depends on the UFR rather than real observed prices / values. So stresses in the extrapolation zone of the curve should tend to impact the curve much less since the UFR reflects a final ultimate rate that could – as currently suggested by EIOPA– change its value due to changes in the components that make up the UFR value itself. The method deriving the UFR limits yearly impact to a number of BP. Stress calibration needs to be in line with this concept and should therefore not stress the extrapolated portion more than the concept of UFR-derivation suggests. **Shifted log-normal model** Using a shifted log-normal model for modelling the evolvements of interest rate yields (i.e. modelling the log-returns of shifted interest rates) would be a way to model the considerations made in 17.3. In this model the interest rate data used for the model calibration are first shifted upwards by δ, then the log-returns of these data are taken and a normal distribution is fitted to them. The final model then simulates the interest rates from this normal distribution and afterwards shifts the results down by – δ. The key features of this model are: • Interest rates are bounded from below by – δ. • The size of the interest down shock depends on the best estimate level of the initial yield curve, i.e. the	

closer the best estimate yield curve is at –δ the smaller the shocks are; this feature represents the term "elasticity".

- Mathematically it can be shown that this model is a blend of a normal and a log-normal distribution and hence combines relative (log-normal distributed) and absolute (normal distributed) stresses in a sensible way.

With the concept of a shifted log-normal model calibration of the interest rate risk shocks can be performed resulting in curves that show realistic forms and take into account both absolute and relative components in shock. This reflects the elasticity of the interest rate risk which is dependant also upon the currently observed absolute level of interest rates (e.g. negative rates might change to a more negative rate but with less absolute amplitude as would rates that are positive with several 100 BP).

Stress calibration

However, stress calibration tends to become difficult beyond the last liquid point. Here, even for the derivation of best estimate curves methodology relies on extrapolation making use of an UFR.
For the UFR, current discussion tends to limit yearly changes to the revised UFR methodology to a fixed number of basis points annually (between 10 and 20 BP). The limitation of volatility reflects the steadiness of the long-term UFR but takes into account at the same time long term trends in interest rates also.
For the interest rate risk established technology and methodology allow for a dual method as follows perfectly in line with current UFR discussion and the best estimate curve methodology:

1) Use shifted log-normal model to calibrate interest rate risk in liquid zone of the curve.
2) Use similar extrapolation technique like in best estimate case starting on level of newly calibrated stressed curve from LLP and extrapolate towards shifted UFR under stress shifted by maximum annual change rate of UFR (10 – 20 BP).
3) Perform step 2 for both interest rate down and interest rate up shock

With this methodology the calibration already takes into account the change in UFR so that no additional stress will have to be considered within the standard formula. Also, the concept reflects the construction of the best estimate curve and thus makes use of already set standards.

Description of the shifted log-normal model:

Here, the log-returns of shifted spot rates are modelled via a normal distribution. We briefly sketch how the model can be set up for any individual spot rate tenor (without including the PCA approach, noting that this can be transferred to a PCA setup similarly):

Approach:

1. Starting point is historic time series data used for the calibration for spot rate with tenor n, i.e. $\{r_n(t_1),\dots, r_n(t_k)\}$ where $r_n(t_i)$ refers to the value of the n-year spot rate at time t_i
2. Shift all historic time series data for the spot rate with tenor n under consideration used for the calibration by the shift parameter δ, i.e. consider $\{r_n(t_1)+ \delta,\dots, r_n(t_k) + \delta \}$ as input for the calibration.
3. Derive log-returns of this time series, i.e. consider time series $(X_n(t_i))_{i=2,\dots k}=\{\ln[(r_n(t_2)+ \delta)/(r_n(t_1)+ \delta)],\dots, \ln[(r_n(t_k)+ \delta)/(r_n(t_{k-1})+ \delta)]\}$
4. Derive empirical standard deviation σ_n of the time series data from 3.
5. Assume that the log-returns of the shifted spot rates are normal distributed with mean zero and volatility σ_n.
6. Scale volatility of σ_n to annual level σ_n^{ann}, i.e. set $\sigma_n^{ann} = \sigma_n/\mathrm{Sqrt}(D)$ where D is the fraction of a year covered by t_i-t_{i-1} (i.e. in case of monthly data, we have t_i-t_{i-1} =D=1/12)
7. The spot rate $r_n(T+1)$ with tenor n in one year from the valuation date T can hence be expressed as $r_n(T+1)= (r_n(T)+ \delta)*\exp(X_n) - \delta$ where X_n is normal distributed with mean zero and volatility σ_n^{ann}
8. From there we can derive the 0.5%- and 99.5% quantile, $q_n^{0.5\%}$ and $q_n^{99.5\%}$, of $r_n(T+1)$ under this distribution as $q_n^{0.5\%}=(r_n(T)+ \delta)*\exp(\sigma_n^{ann}*N(0.5\%)) - \delta$ and $q_n^{99.5\%}=(r_n(T)+ \delta)*\exp(\sigma_n^{ann}*N(99.5\%)) - \delta$, where N(x) refers to the x%-quantile of a standard normal distribution

Derivation of the shift parameter δ:

The shift parameter δ is a crucial ingredient for this model and should be derived in a way which reflects both economic and purely statistical properties of the model in a sound way:

- Economic point of view: As mentioned above, -δ represents the lower bound for the spot rates in the shifted log-normal model; therefore, real-world expectations based on macroeconomic considerations (see also 17.3) should be reflected in the choice of in –δ

- Statistical point of view: The parameter δ should be chosen in a way that the resulting distribution (which is of shifted log-normal character) reflects the properties of the historic time series of shifted log-returns of the spot rates suitably. Tests under consideration and calibration paradigms for δ should hence include:

    - Goodness-of-fit tests (e.g. Kolmogorov-Smirnov test or similar tests) give indications where the choice of δ leads to a distribution which suits the historic data's empirical distribution.
    - Similarly, graphical assessments such as a q-q-plot (empirical distribution of historical data vs. model distribution) can give a good indications whether the choice of δ has been suitable.
    - Backtesting exercises, where the model under a certain choice of δ is calibrated and its predicted one year up and down shocks are compared to the actual one year developments of the corresponding spot rates (and hence show whether the model's predicted 1-in-200 year shock has been less conservative than what happened in reality) give further evidence on the suitability of the value of δ.
    - In general that shift parameter δ is applied in order to avoid the weaknesses of an approach measuring (log-)relative stresses which a. are not defined for negative interest rates and b. tend to measure extremely high relative movements once the underlying interest rates are very low but positive. Therefore, a necessary condition for the level of δ is to be large enough for any historic shifted spot rate level $r_n(t_i)+ \delta$ to be positive and large enough for the resulting log-return $\ln[(r_n(t_i)+ \delta)/(r_n(t_{i-1})+ \delta)]$ not to be unreasonable high unless there has been some extreme interest rate movement in reality.
    - Having in mind the statements from the previous bullet it could therefore be reasonable to use values of δ which depends on the spot rate tenor. In this case the rationale would be to calibrate the vector $(\delta_1, \delta_2,..)$ such that the tenor-wise shifted historical spot rates are on a comparable level.

It should be emphasized that both of these aspects should be jointly reflected in the choice of δ since there would be no sense in either imposing a lower boundary purely based on statistical arguments which however would contradict economic theories or alternatively deriving a purely economically based lower bound which is not backed by the statistical properties of the underlying model (in the latter case one would conclude that either the model is not suitable or the choice of the lower bound is not suitable).

Derivation of the parameter b in the b-factor approach proposed by EIOPA:

	The model proposed by EIOPA is essentially an affine model where the one year shock is explained by a linear combination of the present spot rate level and a shift b. This model hence combines a relative with an additive shift. Therefore, it does not incorporate a lower bound for the interest rate level and hence, b has no simple interpretation (compared to the parameter δ of the shifted log-normal model) and any macroeconomic view for the calibration of these parameter therefore becomes irrelevant. The calibration of the parameter b (and essentially the parameter a as well) however should be based on the same statistical considerations as mentioned above, i.e. goodness-of-fit tests and backtesting exercises should be applied when deriving these parameters. The standard textbook approach for the calibration of a and b would be to perform some ordinary least squares regression.	
Q17.16	Basic risk measurement method would be to estimate the volatility with a rolling estimate using also the latest historical data and then applying some parametric distribution approximation to estimate 99.5% Var. Method for estimating interest rate volatility could be for example rolling standard deviation, EWMA or GARCH. This type of methodology results in changing the SCR shock parameters but method parameters should selected in such a way that an absolute stress does not fluctuate too quickly over time. Possible distributions considered would be normal and t. The use of heavily asymmetric distributions might be appropriate but this could include implicit view on how negative rates actually can go, which cannot be estimated from the data. There are several pros and cons for this type of method. One good point being that it takes implicitly into account all the market information when deriving the shock parameters including the absolute level of interest rates.	
Q18.1	No. The treatment in the DTA of the Risk Margin. The run-off of the Risk Margin is not part of the fiscal result, so the DTA cannot be defended by fiscal results. If relegation of tier 3 cuts off the DTA position the full DTA position should still be defended in the LAC DT. A cut-off of the used DTA in the LAC DT calculation makes the framework more in line. Methodologically, it seems inconsistent to allow freedom / impose requirements for LAC DT and not have the same freedom / requirements for DTA : - One suggestion is to limit the sum (DTA + LAC DT) to 15% without additional requirements on future profits. - It seems unbalanced to limit DTA (arbitrarily) to 15%, whereas much more effort is spent on regulating LAC DT. LAC DT is only needed in a stress scenario. It seems more useful / realistic to get additional input on future	

	profitability in the central scenario when allowing DTA to exceed 15%. In Directive 2009/138/EC, tier 3 limit was set much wider than 15%: “the eligible amount of Tier 3 items is less than one third of the total amount of eligible own funds”. DTA and LAC DT only make sense if there are future fiscal profits. In allowing for LAC DT, future fiscal profits can be justified from the existence of new business. It seems inconsistent to allow DTA (albeit capped at 15%) and LAC DT, but not at all to allow goodwill (capturing future new business opportunities). The limit of net DTA to 15% of SCR creates an issue. There is an inconsistency in that (1) net DTA above that level does not count towards OF, but (2) net DTA above that level limits the room for LAC DT. This excess net DTA in the basis situation should (in the stress scenario) have a benefit that at least equals that of LAC DT. DTA is calculated at the fiscal entity level. This may differ from the legal entity that is required for LAC DT. It seems more consistent / realistic to calculate both at the fiscal entity level.	
Q18.2	We think that returns to be taken into account in the recoverability of the TDAs or the absorptive capacity should solely take into account the financial returns of new business If returns must be defined in a fiscal sense, some suggestions are : - assuming a standard (buy-and-hold / rebalancing policy) for assets / liabilities. - abstract from external in- or outflow of cash (e.g. to and from the holding). [Assuming no new business (no renewals), but this is not necessarily an assumption on ‘return on assets / liabilities’.] An alternative would be to use economic returns. The following two approaches should give the same result : - Assume risk-neutral returns in line with the forward risk-free curve and discount using that same risk-free rate. - Include a risk premium, and discount using a risky discount rate. Any other assumption will be inconsistent with market valuation of the asset / liability. For the assets, this should be self-explanatory. For the liabilities, the risk premium is captured in the Risk Margin. Applying the above principle to liabilities therefore means either of the following : - Project BE using the liability discount rate (presumed risk-free).	

	- Include the freefall of the Risk Margin, and discount with a risky liability curve. Which should boil down to the same.	
Q18.3	Using risk free rate appears to harmonize and reduce subjectivity; it also enables removing risk premium on future financial returns. Should optimistic and pessimistic scenarios be introduced in the guidance, the guidance should indicate that those scenarios need to be consistent with the ORSA.	
Q18.4	To quantify LAC DT, fiscal profits need to be projected (explicitly or implicitly). For very long-term business, with stable fiscal profits and little new business, this may be sufficient. For short-term business, much more reliant on new business, fiscal projections will (implicitly or explicitly) require projecting ‘real’ economic returns.	
Q18.5	From an operational point of view, one approach would be to define an equivalent scenario in order to identify the origin of the losses to which the SCR corresponds (without diversification) and thus to assess the potential impacts on New Business. Ideally new business should reflect both policyholder and management actions and could be scenario dependent if this is appropriate, feasible and material. It should be consistent with ORSA scenarios. Such projections seem to involve self-reference to the regulatory outcome. If the regulatory outcome is positive, new business can continue and approval will be justified. If the regulatory outcome is negative, new business will not continue, and negativity will be justified. Seems as if we need a way to remove this forward-looking element to get a closed form solution for this ‘rational expectations equilibrium’. A few suggestions to get more realistic projections : - Allow new business to the average level of a set period, say, three to five years. - Given increased competitiveness and markets, it seems unreasonable to presume continued profitability of new business beyond, say, five years. Forward-looking dividend discount model scan be looked at for reference. Also, most business plans do not go beyond 5 years.	

	- The development of the local market as a whole. - Perhaps the local regulator can say something about this. - A review of projections by the second line of defence (actuarial). - Maintaining a record of forecasting accuracy seems useful. It may be useful to clarify that new business is defined in a SII sense, also including renewals.	
Q18.6	The uncertainty of long time horizons in the projection of LAC DT is exactly the same as in any other calculation of all other positions in the solvency balance sheet, just like the technical provisions. Exactly those time horizons, however, are necessary to evaluate long term business with guarantees like annuities adequately. See Q. 18.5	
Q18.7	A link between the recovery period in the ORSA and in the LAC DT could be envisaged to offset differences between jurisdictions. See Q. 18.2 (for returns on assets / liabilities) and Q. 18.5 (for new business). There should be made a distinction between the robustness of the projection source. The run-off cash flows of the existing business, which is also the basis for the best estimate liability gives good long term projections	
Q18.8	We believe this is a sensible approach and suggest a maximum of 5 years which seems to be a maximum length of business planning. The time horizon for the projection of future taxable profits should be the same as the time horizon used to calculate all other positions of the solvency balance sheet, since deferred taxes also occur over the entire horizon. The uncertainty of long time horizons in the projection of LAC DT is exactly the same as in any other calculation of all other positions in the solvency balance sheet, just like the technical provisions. Exactly those time horizons, however, are necessary to evaluate long term business with guarantees like annuities adequately. A limitation is a last step to consider. If a limit is to be used, the new business assumptions for life is more logical than assets returns, as these calculations include more the companies view instead of the market view See Q 18.2 for assets / liabilities. It is inconsistent not to equate market value to discounted cash-flows arising from the assets / liability.	

	As for new business, see Q. 18.6 (five years).	
Q18.9	Setting LAC DT to the amount of net DTL is an appropriate simplification if • they apply to the same tax authority • they apply to the same fiscal unit. Presumably, the idea is that net DTA should (just as Goodwill) not count towards own funds. This is a very conservative assumption, inconsistent with the current 15% DTA allowance. Ignoring the earn capacity of the company doesn't align with the fiscal treatment An alternative would be to cap (net DTA + LAC DT) to 15% of SCR.	
Q18.10	This could lead to an uneven playing field between companies that have similar future profits expectations but start from a different profit history (e.g. Company A and B have similar future cashflows before tax, company A, due to past losses, has a net DTA, Company B has a net DTL). If Goodwill is not counted towards OF, this reduces average solvency of the industry. The calibration of SII parameters could be affected. The same thing applies if DTA is (implicitly) no longer allowed to count towards OF.	
Q18.11	We consider that multiplying instantaneous loss by average tax rate is usually an acceptable proxy. We believe this should take into account the materiality of the LAC compared to the BSCR It does not seem to be necessary to explicitly set up the entire solvency balance sheet immediately after the shock loss. In a shocked balance sheet the material differences to the basic balance sheet occur in the assets and the technical provisions, thus in the resulting net asset values. Therefore, the sum of the Basic SCR, operational risk and the loss absorbing capacity, as the change of the net asset value, seems to be an appropriate reference value to calculate the deferred taxes after the shock loss.	
Q18.12	The current set-up is very unrealistic. In real life there are no 'T=0' shocks. Losses accrue over time. Neither the insurer nor the regulator wait with management actions until SII ratio is, say, 40%. As a result, the exercise abounds in assumptions that are impossible to validate. Conceptually, it also seems inconsistent to rely so much on management actions in a first pillar calculation. If you allow management actions (increased funding and/or reduced risk) in this first pillar, why measure risks in the first	

	place? Why not simply focus on how risks are managed once they occur? If you can always manage risks down, there is no need to measure them. It seems more appropriate to allow LAC DT conditional on sufficient clarity in the second pillar, which is more about risk management. ORSA scenarios, and corresponding management action, should cover the whole spectrum of SCR risks. 'Living will' ('illness will'), clarifying the recovery plan when SII ratio falls below SCR (but stays above MCR), could achieve a similar objective. Indeed, one may expect the motivation of risk appetites / target SII ratio's to be linked to the timeliness / complexity / likeliness / realism of management actions to recover.	
Q18.13	See Q. 18.12	
Q18.14	The Delegated Regulations are overall not very clear on the calculation of the LAC DT. As a consequence in some countries (strict) additional guidance is given from the local regulator, whereas other countries do not have this additional guidance and accept a simple 25% approach. The question is whether this helps to create a level playing field. On the whole the requirements need to be set clearer and far simpler. Also, It seems useful to clarify whether or not a 'dynamic VA' can be implicitly assumed (after a credit spread shock).	
Q18.15	It may be useful to establish a 'health indicator' for companies (e.g. by looking at 3-yr average of Free Cash Flow). Health in companies is captured by Free Cash Flow. Such a 'health indicator' would be expected to be a major ingredient in company target SII ratios.	
Q18.16	The idea behind IFRS / DTA is to smooth cyclicality. This aspect of LAC DT should be cherished. Procyclicality could be an issue if the last three years Free Cash Flow (as suggested above) were cyclical. The length of time over which losses can be written off may also create cyclicality.	
Q19.1	The calculation of the risk margin is influenced by the methodology prescribed and the cost-of capital-rate. CoC – rate is set to 6% in Article 39 of the Delegated Regulation. This long-term expected value was developed from market data at that time. The amount of own funds needed to support the insurance obligations is calculated using the relevant risk-free interest rate term structure. These have become significantly higher parallel to the movement in capital markets. By this mechanism the liabilities have been adapted to the changes in the market and increased in accordance with requirement of market consistent valuation. The additional rate that an undertaking would incur holding that amount of own funds remained unchanged.	

We see that as risk margin valuation has been defined in a completely different economic environment based on highly theoretic assumptions it should be given a fully objective review. There seems to be an issue with the over prudency (relative size of RM) and the volatility. Regarding the CoC rate, as the market yields (swap, govies …) have fallen and remained at a very low level including negative yields in some market at some maturity, it can be more difficult to justify the level of 6 % for the cost of capital. Especially we find the following issues considering the CoC-rate:

- The CoC-rate should be coherent with the possible revision of the ultimate forward rate to a lower value. Also methods deriving risk margin CoC percentage should be in line with derivation of UFR. Long-term averages and data should be available for the assumption of spread over risk free rate accordingly. Thus, a direct link to capital market movements will be given and would reflect in a similar manner ideas that have been taken into account following UFR discussion.
- In comparison with the weighted average cost of capital (gearing methods or WACC approach) used in some valuation methodologies, using 6% for all markets and all currencies is none of the least a simplistic approach but also incoherent with the reality of the cost of capital nowadays.
- The proposed third step in the proposed calibration (to obtain risk margins consistent with observable prices in the marketplace, 3.100 / 3.139) was basically ignored (see articles 3.118 – 3.120). The relevant market is better described in MCEV CoC (see e.g. Willis Towers Watson, July 2016 “Insights – 2015 Life Supplementary Reporting”). This gives rise to a CoC of about 4.5%.
- A lower CoC can also be justified as insurance risks are much more diversifiable than market risk (beta of 0 could be argued). Terken, J.J., 2012, “Determining the Cost of Equity for an Insurance Company”. Thesis Executive Master of Business Valuation.
- A lower rate is also more consistent with 3% CoC that currently apply to hedging programs of major insurance risks like longevity and mass lapse.
- In Solvency II, by definition all insurance companies having capital the amount of SCR or higher are in the investment grade level (VaR 99,5 criteria) Looking the long term average of both EU and US investment grade spread levels it can be noticed those having an average between 2 to 3 percent. This could be used as a benchmark to replace the 6% spread in CoC.

Deeper thoughts on risk margins can also be found in the AAE paper “Market Consistency”.

Q19.2	We see that taking a long term perspective with CoC-rate would give the needed stability of the new cost of capital with an appropriate justification or calibration (for example 4% instead of 6%) in consistency with the long term economical approaches. Due to long-term usage of risk margin approach, the cost of capital percentage value should be based upon long-term, average rate since calculations do take a very long time span into account. We also agree to avoid artificial volatility with the pro-cyclical use of a “market” cost of capital. Anyway this probably needs to be investigated a bit more. For example the Risk Margin is highly sensitive to interest rates but this is not the result of the CoC, but of underlying components / discount rate in the Risk Margin.	
Q19.3	Compared to other components of the solvency II balance sheet, the risk margin itself seems to be inappropriately too high given the relations of the solvency balance sheets components. Especially we find the following points here : • Initially, the risk margin was set up as a sort of security add and should by definition not dominate the balance sheet itself. • The LoBs with long term maturities are logically more impacted by the RM valuation. The contracts boundary is therefore an issue in particular for liabilities with future projected premiums. Avoiding too much complexity in RM calculation facilitates its analysis. Therefore, the possibility to use simple methodologies is important. The methods of calculation differ a lot between insurers and can be very complex without economic consideration (stochastic on stochastics calculations in a risk neutral world for example). • Interest rates have had a major impact on the Risk Margin (through the discount rates, and through the SCR). Companies which have used to hedge only the Best Estimate, have quickly recognised the need to make an explicit decision on whether or not to hedge the interest-rate risk of the Risk margin (e.g. the longer-term Life / Pensions business). Anyway the interest-rate sensitivity of the Risk Margin is justified. It is ‘logical’ / ‘intuitive’ that the EUR-risk in liabilities move up and down with the (interest-rate driven) level of liabilities. This is not necessarily true for the CoC –Rate. See also:	
Q19.4	In the future work with RM, EIOPA could take into account the following comments: • Largest issue of the calculation of the risk margin is the simplification of not taking the risk margin into account in the calculation of the SCR. This simplification ought to be reconsidered. • In the mass lapse scenario (but also when deriving the capital of other risks) the effect of the release of the	

	risk margin is not taken into account due to simplification. This simplification can have a very large effect for business with liabilities with long durations (whole life/funeral) and therefore also on the risk margin of these businesses. This could be solved by changing the Delegated Regulation in such a way that this would be possible and the SCR and risk margin could be derived in a few steps. Convergence would possibly take place quite quickly. • The current calculation method causes an unrealistically high risk margin for (Dutch?) funeral businesses, caused only taking policies with a surrender value higher than the BEL. Due to asymmetry (negative BEL vs positive BEL) in the portfolio it can be observed that despite the BEL not decreasing, the SCR and risk margin increase substantially • The current formula causes technical issues for the valuation of the RM due to the complexity for actuarial models to project the SCR. Also, the selected simplification between those proposed by the regulator has significant impact on the amount of the RM. The projection of a simple metric would facilitate the RM calculation. Moreover, the undertaking absorbing the insurance liabilities with benefits from other additional diversification effects, due to its own initial insurance liabilities. Its SCR could thus be lower. For these reasons, another metric, such as the linear MCR, could be considered for the calculation of RM • One additional point relating to the CoC-rate is that could it resemble a long-term credit risk premium? We do not think that is correct as the Delegated Regulation was based on an equity risk premium. And as the rating is mentioned in the derivation, it’s only used to decide on the amount of equity (SCR) that the equity risk premium applies to. Rating is not used to decide on the equity risk premium applied to that amount of equity. To the extent that there is far less discussion on cyclicality of the equity risk premium, this question does not seem relevant. In theory, a case could be made that the equity risk premium of Life Insurance companies is related to the credit risk premium, given the size of credits in their portfolios. But we have not seen literature that supports this approach.	
Q20.1		
Q20.2		
Q20.3		
Q20.4		
Q20.5		
Q20.6		

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Q20.7		
Q20.8		
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