

6.10 Premium and Claims Reserve risks

Q140

Q140 Section 6.10.4.1 Non-life exposures should be reported based on the location of risks to ensure consistency across IAIGs. Regarding the reporting segment, which of the following should be used:

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
China Insurance Regulatory Commission	China	IAIS Member	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	
Financial Supervisory Service	Korea	IAIS Member	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	Detained segmentation based on existing jurisdictional reporting segment is deemed more appropriate. If compact standardised segmentation is applied, there are likely chances that each participant in IAIG may interpret and apply the segments differently.

KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	A more compact standardised segmentation? If "yes", please explain the rationale.	It will be easier to apply and results will be more comparable between IAIGs, although it might be less risk-sensitive.
National Association of Insurance Commissioners	USA	IAIS Member	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	We prefer a more detailed reporting segmentation based on existing jurisdictional segments. This does not have to have the same level of detail as the >200 segments currently used in ICS, but should preserve the most material lines of business. It would not be appropriate to have a standardized segmentation, as in BCR, that ignores jurisdictional differences.
Ageas	Belgium	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	Using different jurisdictional segments increases the number of segments, doesn't allow for an equivalent treatment for same lines of business and doesn't allow for an adequate aggregation.
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	<p>We see the option of a more compact standardised segmentation or an ability to use or reuse an existing basis of exposure as being preferable to the alternative of more granularity which can bring both operational complexity as well as introduce measurement error.</p> <p>The current segmentation calls for data mappings that are not established for most undertakings and groups due to the requirement to segment the business by location of risk rather the location of the entity writing the business. For example US risks written in London market would need to be classified using US statutory lines of business, where currently IAIGs would be capturing that business under Solvency II classifications.</p>

					<p>In practice this re-mapping of classes is likely to be made using high level allocation assumptions for certain lines of business, particularly for reinsurance business where it is not easy to determine the exact location of the risk (e.g. liability business written for global corporations; marine & aviation).</p> <p>In addition to the operational complexity, this introduces significant scope for measurement error which then serves to undermine the efforts to parameterise these risks at the level of granularity currently proposed.</p> <p>The alternatives for implementation would appear to be either a move to more simplified buckets with more work performed to reflect the appropriate level of calibration, or to a more bespoke basis of exposure measurement as reflective of a company's own mappings and the use of undertaking specific parameters.</p> <p>For example, a more simplified approach could be to use existing jurisdictional segmentation based on the location of the writing entity, which would align to a company's existing reporting structures. If there are specific lines that IAIS believes pose additional risk (for example US liability written in Europe) then they could consider targeted breakouts if evidence suggests this is material.</p>
Canadian Institute of Actuaries	Canada	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment	Automobile lines should be separated out, split between liability bodily injury, personal injuries, and damage to the vehicle or third-party vehicle. These coverages can vary greatly by country, and even within a specific country.

				across segments could be ensured.	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	We suggest adopting the same segmentation as that of local regulations, to enable the consistency of risk and capital management for each segment by the company and also achieve the consistent supervision of the local regulator.
Allianz	Germany	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	Solvency II reporting segments should be used for European IAIG for all risk locations. This segmentation is available in Europe and would be more compact than the segmentations used for other regions. This would allow for consistency across IAIGs without additional allocation efforts.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	European IAIGs should use the available segments from Solvency II for all risk locations.
Munich Re	Germany	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	
International Actuarial Association	International	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment	Yes – Jurisdictional Reporting should be used: Notwithstanding the comments noted further below, we believe ICS should make use of existing jurisdictional reporting segments, wherever possible, because:

				<p>across segments could be ensured.</p>	<ul style="list-style-type: none"> • Many jurisdictions have calibrated standard formulas and those calibrations (not necessarily the factors themselves, as different jurisdictions have different standards) can provide the basis for ICS calibrations. • The jurisdictional segments reflect risk as understood by those closest to the business. • If jurisdictional reporting is inadequate, the overall safety of the insurance system will be improved in the long run by encouraging higher standards in all jurisdictions. • The accuracy of classification coding is improved if the coding is used for multiple purposes. • Regardless of the jurisdiction basis, the results can be consolidated into whatever buckets ICS chooses to use. <p>Note 1:</p> <p>The points above are most practical in the US and EU where there the ICS regions correspond to the existing RBC systems and common reporting framework. In those regions, we believe the jurisdictional reporting segments should be used.</p> <p>There are regions that do not have common reporting frameworks. In those regions something else might be necessary. The CD does not provide enough detail from IAIG reporting for us to comment in depth on those situations.</p>
--	--	--	--	--	--

					<p>Note 2:</p> <p>Companies, particularly reinsurers, may not have “location of risk” on all policies. Even if companies have some jurisdictional data, non-local companies may not have segmentation in the same detail as local companies</p> <p>We assume ICS will allow companies to apply reasonable allocation procedures when that is the case.</p>
General Insurance Association of Japan	Japan	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	<p>Adopting new reporting segmentation would make it difficult to capture the basic information necessary to assess exposure such as premiums. Therefore, it is more practical to base segmentation on existing jurisdictional reporting segments.</p> <p>Factors to be applied to each segment of each jurisdiction should reflect the risk features of each jurisdiction and segment, and be validated and adjusted based on 2016 Field Testing data.</p> <p>Reporting based on the location of risks could be operationally unfeasible. Approximations such as reporting based on the location where risks were underwritten, and the location of the head office of the insurance entity that underwrote the risks should be allowed for ICS 1.0.</p>
Great Eastern Holdings Ltd	Singapore	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	This is to allow for better comparability across IAIGs.

Swiss Re	Switzerland	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	The input data used for the analysis did not include an attribute that could be used to allocate the business to a particular jurisdiction. The segmentation should be able to be based on management units (reflecting how the group is organised) which sometimes have the responsibility for multiple geographical markets. A more sophisticated approach would be to allow for the use of regulatory approved internal models.
American International Group (AIG)	U.S.	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	Yes; we believe the ICS should consider further alignment with existing jurisdictional reporting segments.
Institute and Faculty of Actuaries	UK	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	There is a potential for inconsistencies here caused by differences in IAIGs systems and data.
RAA	United States and many other jurisdictions	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	We support a more compact and standardized segmentation to simplify compliance with the ICS. It appears that the geographically based risk factors are substantially similar for similarly defined risks across the six geographical segments. If these segments could be pared down or combined it would make compliance more feasible, with little loss of risk sensitivity in the ICS calculation. Compliance with the geographical segmentation requirement may more difficult for reinsurers, since it is based on the location of the risk rather than the location of the entity that assumes the risk. The latter

					is typically the basis for financial reporting. For example a European reinsurer would typically report assumed property or liability reinsurance using the EEA or Solvency II based risk factors. The LOB categorization they use for domestic reporting may not match exactly with the LOB and risk factors from the jurisdiction where the risk is located. This would require a translation of this business into the ICS factors for that other jurisdiction, which may require significant effort and may only provide marginal incremental accuracy in the ICS calculation. Standardizing the risk factors would reduce this complexity.
American Academy of Actuaries	United States of America	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	The risk factor for the segments should be based on comparable metrics applied to the data or basis for the factor. We note that consistency in treatment is actually more of a concern with broader segments, as risk can vary materially across jurisdictions and markets for a given product type. Hence applying the same risk factor to exposures across jurisdictions does not take into account the inherent product and risk differences by jurisdiction, resulting in non-comparable capital requirements for entities with different mixes of exposure by jurisdiction. For example, homeowners policies in the United States do not cover floods, while similar products in other countries do. As another example, auto policies in the United States typically have policy limits of \$500,000 or less, while in the U.K. there are no policy limits. Hence risk factors that group together products from different jurisdictions would not result in comparable capital requirements.

American Insurance Association	United States of America	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment across segments could be ensured.	<p>Risk exposures are idiosyncratic to their location, so a standardized segmentation would fail to recognize differences among jurisdictions. Therefore, we would support a detailed reporting segmentation, with the caveat that they should be streamlined. Not all exposures require the same level of reporting detail.</p> <p>Of course, the true answer lies somewhere in the middle, utilizing internal models – which this consultation document has chosen to ignore. If the ICS, line of business and geographical segments do not map to existing systems because the detailed information currently required varies by jurisdiction, the firm would need to use mappings and approximation, and thus introduce error into the estimation of capital. There is a significant risk that the ICS basis does not sufficiently recognize the trade-off between (1) a granular assessment of exposure as may be applied using an internal framework and (2) the creation of an external basis with an artificial construct. In this respect, the key risk is that capital will be sensitive to classification as such classification risk is heightened by the imposition of additional segmentation.</p>
CNA	USA	Other	No	A more compact standardised segmentation? If "yes", please explain the rationale.	A more compact standardized segmentation should be utilized. As noted during field testing, the majority of business is written in a small number of lines. Further granularity increases costs without any proportional increase in benefits.
Property Casualty Insurers Association of America (PCI)	USA	Other	No	A more detailed reporting segmentation based on existing jurisdictional reporting segments? If "yes", please explain how consistent treatment	It is more appropriate to use existing jurisdictional reporting segments. Risks differ materially between jurisdictions for many different reasons, and using a standardized segmentation will be less risk-sensitive.

				across segments could be ensured.	
--	--	--	--	-----------------------------------	--

Q141

Q141 Section 6.10.4.1 Should projected net earned premiums be used as the exposure base for Premium risk? If “no”, please specify what other measure should be used and why.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Property Casualty Insurers Association of America (PCI)	USA		No	No	No. Net written premium is more appropriate. This provides a measurement of risks that are actually covered, rather than risks that are estimated to be covered.
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	
EIOPA	EIOPA	IAIS Member	No	No	The capital requirement should cover the risks taken during the following 12 months, including risks related to new business. From a risk perspective, the existing annual contracts in N being renewed at some point in time in N+1 should be taken into account. Hence the volume measure should take into account: - The expected present value of premiums to be earned by the insurer after the following 12 months for existing contracts; - The expected present value of premiums to be earned for contracts where the initial recognition date falls in the following 12 months but excluding the premiums to be earned during the following 12 months.
BaFin	Germany	IAIS Member	No	No	Risks related to new business in the following 12 months should also be captured.

Financial Supervisory Service	Korea	IAIS Member	No	Yes	
KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	
National Association of Insurance Commissioners	USA	IAIS Member	No	No	We would suggest using Net Written Premiums.
Ageas	Belgium	Other	No	No	Net earned premiums don't reflect a proper measure of risk exposure in a factor-based model with the same parameters for all companies. Indeed, for the same risk-portfolio, the net premium can be lower because the company/market is more aggressive in pricing or because the company work without intermediaries (direct insurance) or the company benefits from low reinsurance prices. In all these cases, the required capital will be lower while it should not be the case. Moreover, the insurance risks being more related to the deviation on loss ratio than the deviation in expenses, 2 companies with different loss ratios but with the same volume of premium and the same combined ratio have to same required capital while the company with the lower loss ratio should have a lower capital. The size of the portfolio is also key in determining the volatility. Niche company cannot be differentiated through the premium volume. We do hope that Solvency II and ICS will move into the same direction in changing this. Our suggestion would be the use of number of risks or the use of a "normalized premium" based on the proportion of loss ratio versus the combined ratio.
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	No	Prospective exposure over a one year time horizon corresponds to projected net earned premiums over the next 12 months. However, we believe that the use of earned premium over the next year as the exposure basis for Premium Risk will lead to an overstatement of the risk. The premium risk shock should consider the one year movement in the provisions for

					<p>losses occurring over the coming year. Applying the shock to the full premium means that expected profit is being stressed along with the losses and expenses. To eliminate this, we recommend that premium risk charges be applied to expected losses and expenses, rather than to the full premium.</p> <p>Further, for valuation bases where the full value of Unearned Premium is held as the pre-claims provision (e.g. GAAP-Plus for US GAAP filers), the expected profit within that provision should be recognised within the Premium Risk formula as loss absorbing. For example if the expected combined ratio is 80% and under the ICS stress it moves to 120%, the shock to the company is only the movement from 100% to 120% if the expected profit is not recognised up front on the initial balance sheet.</p> <p>IAIS should look to existing jurisdictional approaches that already address these points, such as the US RBC approach to premium risk which captures both points above (application to losses rather than premiums and recognition of expected profit as loss absorbing).</p> <p>The application of such an adjustment can be built in to the formula such that the inputs from the company remain as net earn premiums projected over the next year.</p> <p>As a second point relating to premium risk exposures, we note that contracts which explicitly cover only property catastrophe risks have their risks fully captured within the catastrophe risk charge. Applying premium risk also to such contracts is to introduce double-counting of this risk.</p>
Canadian Institute of Actuaries	Canada	Other	No	Yes	

Insurance Bureau of Canada	Canada	Other	No	No	We believe that net written premiums or net premium liabilities should be used as the exposure base for Premium risk as they are already used as the exposure base in many jurisdictions.
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	
Insurance Europe	Europe	Other	No	No	<p>The IAIS should envisage to align the volume of premiums used for the ICS calculation and the volume of premiums taken into account in the current estimate.</p> <p>The suggested measure seems reasonable for reserve risk. As to premium risk, the proposed approach does not reflect the differentiation between proportional and non-proportional reinsurance business. Insurance Europe believes that flexible adjustment factors should be allowed for all non-proportional reinsurance (or other forms of reinsurance), including for contracts combining several segments, to reflect more adequately the reality of the risk transfer.</p>
Allianz	Germany	Other	No	Yes	
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	Yes	
Munich Re	Germany	Other	No	No	The proposed method is reasonable for the purpose of scaling the business volume. However, using earned premiums as risk exposure measure includes the problem that safety margins in the premiums are considered as increased risk although they reduce the risk.

Global Federation of Insurance Associations	Global	Other	No	No	GFIA members believe that “projected net earned premium” is an incorrect exposure base to use in the calculations for premium risk. Historical data will be far more consistent. Net written premiums for the most recent year in which complete year-end data is available is the best measure of premium risk available. Attempting to estimate future premiums adds an unnecessary level of uncertainty.
International Actuarial Association	International	Other	No	No	<p>We suggest that:</p> <p>The default exposure base for capital calculations answer should be the higher of the (a) the prior year net written premium and (b) prior year net earned premium.</p> <p>We make that suggestion because:</p> <ol style="list-style-type: none"> 1. A standard formula is necessarily an approximation for any individual company. 2. The standard formula should reflect the more material differences between companies. 3. Subject to the forgoing, where possible, a standard formula should use routinely available, verifiable information (thus, generally, accounting information), because: <ol style="list-style-type: none"> a. That information will be more reliable and consistent between companies. b. That information requires little or no extra cost to obtain. 4. We do not expect that premium volume for IAIGs would vary from year to year in ways that materially affect their indicated capital levels.

					<p>5. We do not expect that IAIGS would routinely have business forecasts for the particular details required for ICS, even though they would have premium forecasts that fit their management process.</p> <p>6. While the Solvency II Standard Formula (SF_SCR) requires forecasts, we note that</p> <p>a. SF_SCR is applied to companies of all sizes, especially smaller companies that do not use internal models, and smaller companies are more likely to have more significant year-to-year changes in premium;</p> <p>b. US RBC and Standard Formulas in Canada, for example, do not require forecast premiums, and, to our knowledge, have not experienced difficulties in the indicated capital requirements due to premium changes.</p> <p>7. Changes in premium from year to year could be one of the many factors that IAIS, through group regulators, monitor and address, if necessary in later versions of ICS.</p>
General Insurance Association of Japan	Japan	Other	No	Yes	
Great Eastern Holdings Ltd	Singapore	Other	No	Yes	
Swiss Re	Switzerland	Other	No	No	The premium risk volume measure will create a similar issue as currently exists within Solvency II, namely that you won't be able to recognise new or extended quota share transactions because last year's net earned premiums will always be higher than the future 12 month net earned premiums by virtue of the reinsurance. The two net earned premiums need to be compared on a like for like basis assuming the reinsurance was in place during the prior 12 months.

American International Group (AIG)	U.S.	Other	No	No	No; we believe the ICS should rely on the reported prior year net written premium and prior earned premium, which is used in various jurisdictions. This information is verifiable through the financial reporting process, and is more reliable and consistent across companies.
Institute and Faculty of Actuaries	UK	Other	No	Yes	
National Association of Mutual Insurance Companies	United States	Other	No	No	NAMIC believes that projected net earned premium is an incorrect exposure base to use in the calculations for premium risk. Earned premiums are by nature the premiums that have been actually been earned and projecting an amount “earned” would be very difficult to accomplish. Historical data will be far more consistent. Net written premiums for the most recent year in which complete year-end data is available is the best measure of premium risk available. Attempting to estimate future premiums adds an unnecessary level of uncertainty. However, there are some adjustments to net written premium that will be needed: 1) net written premium levels also include premiums for catastrophe risk so more work is needed to adjust the amount of net written premiums for catastrophe risk illustrated in section 6.11; and 2) net written premium would also include embedded amounts for operational risk which will need to be factored out if it is deemed necessary to incorporate an operational risk charge in the ICS. See our comments to section 6.14 for more information.
RAA	United States and many other jurisdictions	Other	No	No	This is unnecessary as premiums for IAIG’s should not vary significantly from year to year. Current earned premiums are a better alternative. In general though, using earned premiums as an exposure measure is somewhat flawed since any safety/profit margins in the premium would increase the risk factor even though economically such additional premium reduces risk. For example, for US GAAP GAAP Plus filers, the full value of the UPR is held as the pre-claims provision. The expected profit within that provision should be recognized within the premium risk formula as loss absorbing. If the expected loss ratio is 80%, but under ICS stress

					it moves to 120%, the stress to the GSII is only the movement from 100% to 120%, since the expected profit is not recognized in the GAAP Plus balance sheet.
American Insurance Association	United States of America	Other	No	No	No – the exposure base should be Net Written Premiums.
CNA	USA	Other	No	No	Either net earned or net written premium would be a reasonable exposure base.

Q142

Q142 Section 6.10.4.1 Should net current claims estimates be used as the exposure base for Claims Reserve risk? If “no”, please specify what other measure should be used and why.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	
EIOPA	EIOPA	IAIS Member	No	Yes	The IAIS should also ensure that where current claims estimates are negative, they are not used as volume measure. In that case, volume measure should be set to zero.
BaFin	Germany	IAIS Member	No	Yes	
Financial Supervisory Service	Korea	IAIS Member	No	Yes	
KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	
National Association of Insurance Commissioners	USA	IAIS Member	No	No	Net current claims estimates are discounted. We would suggest using undiscounted net current claims estimates.

Ageas	Belgium	Other	No	Yes	
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	Yes	We note that the exposure measure here will be tied to the valuation basis selected. For example GAAP-Plus for US GAAP filers will use undiscounted claims reserves while GAAP-Plus for European IFRS filers and MAV will use discounted claims reserves.
Canadian Institute of Actuaries	Canada	Other	No	Yes	
Insurance Bureau of Canada	Canada	Other	No	Yes	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	
Insurance Europe	Europe	Other	No	No	The IAIS should envisage to align the volume of premiums used for the ICS calculation and the volume of premiums taken into account in the current estimate. Flexible adjustment factors should be allowed for all non-proportional reinsurance (or other forms of reinsurance), including for contracts combining several segments, to reflect more adequately the reality of the risk transfer.
Allianz	Germany	Other	No	Yes	
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	Yes	
Munich Re	Germany	Other	No	Yes	

International Actuarial Association	International	Other	No	Yes	We assume the definition of current estimate is undiscounted in this exercise, and we point out that, at least in Solvency II, this exposure base cannot be negative.
General Insurance Association of Japan	Japan	Other	No	Yes	
Great Eastern Holdings Ltd	Singapore	Other	No	Yes	
Swiss Re	Switzerland	Other	No	No	See our response to Q141 above.
Institute and Faculty of Actuaries	UK	Other	No	Yes	
National Association of Mutual Insurance Companies	United States	Other	No	No	Net current claims estimates are discounted, consequently, for consistency with the treatment of reserves, we propose that “undiscounted” net current claims estimates are more appropriate.
RAA	United States and many other jurisdictions	Other	No	No	Net current claim estimates would be appropriate for the MAV valuation, but not the GAAP Plus valuation to the extent it is undiscounted. While a net basis is also appropriate for GAAP Plus, there should be separate risk factors for undiscounted claims reserves under the GAAP Plus approach.
American Insurance Association	United States of America	Other	No	No	No – in the U.S., net claims estimates for property-casualty are not discounted. Therefore, we would recommend using undiscounted net claims estimates.

CNA	USA	Other	No	Yes	Yes, provided these do not include MOCE, which is more appropriately considered as capital. Inclusion of MOCE and overlaying a capital charge is double counting.
Property Casualty Insurers Association of America (PCI)	USA	Other	No	No	No. If “net current claims estimates” are discounted, undiscounted net current claims estimates should be used.

Q143

Q143 Section 6.10.4.2 For the purposes of the ICS standard method, is the approach taken in 2015 and 2016 Field Testing adequate to account for diversification effects in Premium and Claims Reserve risks? If “no”, please provide a more appropriate alternative suggestion including rationale, keeping in mind the need to apply a consistent methodology across all jurisdictions, and to balance practicality and materiality with risk sensitivity in a standard method.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	No	While the BMA does not disagree with the general approach followed, we do believe the granularity used to aggregate risks should be enhanced. More specifically speaking, the categories “property like”, “liability like”, “other” and “non-traditional” should be further broken down. We believe the current segmentation is too compact and ends-up misstating dependencies in two aggregation steps (between premium and reserves risks and between lines of business).
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	
EIOPA	EIOPA	IAIS Member	No	Yes	
BaFin	Germany	IAIS Member	No	Yes	

Financial Supervisory Service	Korea	IAIS Member	No	Yes	
KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	
National Association of Insurance Commissioners	USA	IAIS Member	No	Yes	We think diversification should be calculated in a simple and straightforward manner. Although the exact factors used could benefit from more empirical work, we think approach used is appropriate.
Ageas	Belgium	Other	No	Yes	
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	No	<p>Based on member's internal assessments, the proposed ICS calibration appears to provide insufficient credit for diversification within premium and reserve risk. The risk modules do not appear to reflect the portfolio construction of large international companies.</p> <p>It appears that the risk factors have been calibrated to the overall industry level volatilities, which includes smaller insurers, while the factors within ICS should be lower given the size and inherent level of diversification within the larger insurance portfolios of IAIGs to which ICS will apply.</p> <p>While the specification under consultation is an improvement from the previous specification, the calibration is still not considered sufficient. As one such example, we believe the assumption of 75% correlation between premium risk and reserve risk for liability-like risks is too high.</p> <p>We also do not believe geographic diversification is adequately captured within the existing segmentation structure. At present the whole of US and the whole of Europe are each treated as one single geographic region. In reality an insurer who writes in all 50 US states will have greater diversification than one focused in</p>

					<p>Florida, or similarly writing across Europe vs focused in UK. We recommend additional regional segmentation for US and Europe to reflect these differences.</p> <p>Further to our answer to Q40, geographical diversification could be reflected within each existing jurisdictional class with a separate determination of how many geographic regions that class is written across, similar to the current Solvency II / Bermuda approaches.</p>
Canadian Institute of Actuaries	Canada	Other	No	Yes	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	
Allianz	Germany	Other	No	Yes	
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	Yes	
International Actuarial Association	International	Other	No	No	<p>See our response to question 151.</p> <p>In addition, we note that the proposed approach is plausible, but we recommend that the approach should be tested with data from IAIGs and/or other sources, such as standard formula calibration data in various jurisdictions.</p>
General Insurance Association of Japan	Japan	Other	No	Yes	
Great Eastern Holdings Ltd	Singapore	Other	No	Yes	

Swiss Re	Switzerland	Other	No	No	For reinsurers, there may be significant variation depending on the type of business. This issue is therefore best handled for reinsurers through the use of regulatory approved internal models.
Association of British Insurers	United Kingdom	Other	No	No	The component under ICS is too high, particularly as this is due to be applied to Internationally Active Insurance Groups who will tend to be large, well-diversified, multi-line, multi-national non-life insurers.
RAA	United States and many other jurisdictions	Other	No	No	The treatment of geographical diversification is already too complex. We would not support additional consideration of diversification of risks within jurisdictions. See response to Q140 for our suggestions for reducing complexity in this section. In addition, our members believe that the proposed ICS calibration provides insufficient credit for diversification for premium and reserve risk. They believe that the risk modules do not reflect the portfolio construction of large international insurance groups.

Q144

Q144 Section 6.10.4.2 Are the correlation factors appropriate for the ICS standard method? If “no”, please provide rationale and alternative suggestions supported by evidence.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	No	Overall we feel that the calibration of non-life premium and reserve risks is overstated and believe that the primary driver of this misspecification has to do with the granularity and calibration of some of the aggregation steps We believe the current split between 25%,50% and 75% correlations is too blunt and should be further enhanced using 12.5% steps (intervals) as opposed to 25% steps, this is particularly necessary for “liability like” LoBs where a 75% correlation seems overstated. We also recommend correlation between geographical regions to be 12,5% rather than 25% which also seems overstated.
China Insurance Regulatory Commission	China	IAIS Member	No	No	The correlation is significantly higher than those we have calibrated in C-ROSS. For example, there are different factors affecting the Motor and Property lines and there should be diversified impact, but ICS assumes a 100% correlation. We suggest ICS calibrate the correlation factors separately for each region.
EIOPA	EIOPA	IAIS Member	No	Yes	
BaFin	Germany	IAIS Member	No	Yes	

Financial Supervisory Service	Korea	IAIS Member	No		It is difficult to assess the appropriateness of the correlation at the moment. Korean FSS plans to calibrate the correlation based on Korean Insurance market in the near future and the appropriateness of the correlation can be assessed afterwards.
National Association of Insurance Commissioners	USA	IAIS Member	No	No	This is an area where empirical data is available. In particular, the 75% correlation for liability-like lines is higher than available data would suggest. We would recommend continuing to investigate this using 2016 Field Testing.
Ageas	Belgium	Other	No	No	A different correlation factor between premium & reserve risk per category is appropriate but the 75% for liability-like seems too high. Frequency factor for premium risk plays an important role in volatility and this is independent of reserve risk.
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	No	Further work to compare and supply specific suggestions with evidence is needed to validate the correlation factor selections. This should be considered at the same time as the granularity of reporting segments.
Canadian Institute of Actuaries	Canada	Other	No	Yes	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	No	In the measurement of risk diversification, diversification effect is only considered after certain extent of combination for non-life insurance business, which we think is unreasonable. Take motor insurance and commercial property insurance as an example, risk factors of these two types of insurance are not fully the same. And even if their risk factors are the same, the level of influence is still different. This indicates that there is still quite a large amount of diversification effect within the segment. We thus suggest refining the correlations within each segment category or directly setting the correlation coefficients by insurance type.

Actuarial Association of Europe	European Union	Other	No	No	The factors tend to be over prudent.
Allianz	Germany	Other	No	No	Correlations between premium and reserves seem to be rather high. We would definitively expect lower correlations for Category Liability-like and suggest that further work is required on calibrating correlation factors based on empirical data.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	No	The correlation between premium and reserve risk is too high. We believe that further analysis of empirical data would lead to a lower correlation.
Munich Re	Germany	Other	No	No	
International Actuarial Association	International	Other	No	No	<p>First, see our response to question 151.</p> <p>In addition, we observe that the correlation factors in the 2015 Field Testing appear to be based on whether the line of business is long tail or short tail. That is one plausible approach.</p> <p>We recommend testing the alternative hypothesis that the relationship is the same for all lines of business. We suggest that alternative as the relationship between premium risk and reserve risk may also depend on the proportion of reserve that uses premium as an exposure basis. That exposure basis relationship may not be as different between long tail and short tail as implied to the testing factors.</p>
General Insurance Association of Japan	Japan	Other	No	No	Assuming a 100% correlation within the same segment category such as "property-like" is clearly too conservative. Risk and correlation factors should reflect economic reality. Correlation should be validated and adjusted based on 2016 Field Testing data, and qualitative judgement of the IAIS based on such data should be taken into account.

Great Eastern Holdings Ltd	Singapore	Other	No	Yes	
Swiss Re	Switzerland	Other	No	No	The factors seem reasonable as a standard approach for primary insurers. For reinsurers a general answer cannot be given, as this depends significantly on the business composition of the individual reinsurer. The best approach for solving this issue is through the allowance of regulatory approved internal models for reinsurers.
Institute and Faculty of Actuaries	UK	Other	No	No	It seems strange that 'Other' and 'NT Other' both have a 50% factor – i.e. a medium rating – whereas 'Property' has a factor of 25%. The 'other' segments almost by definition should be considered to have little direct relationship with the remaining segments. These factors are also erring on the side of prudence: with half of the segments using a high factor but just one with a low factor does not suggest there has been an appropriate spread of selections.
National Association of Mutual Insurance Companies	United States	Other	No	No	No. The proposed amounts are much too high especially for the liability-like lines. NAMIC proposes that data is available that would provide more accurate correlation factors. Continued field testing in 2016 is the best approach.
RAA	United States and many other jurisdictions	Other	No	No	We believe that the correlation factor for liability lines is too high based on historical data collected by US supervisors. The risk and correlation factors should be carefully selected and calibrated based on empirical studies of available historical data and information collected in future field testing.
CNA	USA	Other	No	No	The approach is reasonable, but some level of validation based on empirical data would be appropriate.
Liberty Mutual Insurance Group	USA	Other	No	No	The proposed amounts are much too high especially for the liability-like lines.

Q145

Q145 Section 6.10.4.2 Is the 50% correlation factor between categories appropriate for the ICS standard method? If “no”, please provide rationale and alternative suggestions supported by evidence.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	No	The factor seems overly conservative attending at the disparity of lines of business wherein contained. As stated in the answer to the previous questions, we recommend a higher granularity between types of LoB and correlation factors (12.5 intervals rather than 25%).
China Insurance Regulatory Commission	China	IAIS Member	No	No	Inappropriate, we suggest ICS calibrate the correlation separately for each region. For example in China, the Motor insurance commonly has a much smaller and limited liability coverage than the developed markets, and we expect the correlation between Motor and Liability should be lower, C-ROSS has assumed 20% correlation.
EIOPA	EIOPA	IAIS Member	No	Yes	
BaFin	Germany	IAIS Member	No	Yes	
Financial Supervisory Service	Korea	IAIS Member	No		It is difficult to assess the appropriateness of the correlation at the moment. Korean FSS plans to calibrate the correlation based on Korean Insurance market

					in the near future and the appropriateness of the correlation can be assessed afterwards.
National Association of Insurance Commissioners	USA	IAIS Member	No	Yes	We would welcome and be happy to contribute to further empirical work on this matter.
Ageas	Belgium	Other	No	Yes	
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	No	Further work to compare and supply specific suggestions with evidence is needed to validate the correlation factor selections. This should be considered at the same time as the granularity of reporting segments.
Canadian Institute of Actuaries	Canada	Other	No	Yes	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	No	We notice that the correlation coefficients between each segment category are all 0.5, which is not reasonable and is higher than those of common regulatory frameworks such as Solvency II and C-ROSS. For example, the correlation between commercial property insurance and marine insurance is quite small. Additionally, motor insurance, property insurance, cargo and specialty insurance and agricultural insurance all belong to Property-like, but it is not reasonable to assume 100% correlation between these business lines for China market. So we suggest re-considering the correlation coefficients between business lines.
Insurance Europe	Europe	Other	No	No	Further work to compare and supply specific suggestions with evidence is needed to validate the correlation factor selections. This should be considered at the same time as the granularity of reporting segments.
Allianz	Germany	Other	No	No	Correlation assumptions of 50% between ICS NL Categories are considered to be too high. It is not clear why e.g. property like and liability like lines should have so

					strong common drivers. Aggregation should be rather done on LoB level to allow for diversification between LoBs that are assigned to one category. Alternatively diversification could be allowed when aggregating to one category.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	No	50 % is not considered appropriate. It is not clear why e.g. property like and liability like lines should have so strong common drivers. Aggregation should be rather done on LoB level to allow for diversification between LoBs that are assigned to one category. Alternatively diversification could be allowed when aggregating to one category.
Munich Re	Germany	Other	No	No	
International Actuarial Association	International	Other	No	No	See our response to question 151. The 50% correlation factor between major lines of business categories is a reasonable starting point, but the value could be calibrated (or at least tested) based on data collected in 2016 Field testing. See reply to Question 151.
General Insurance Association of Japan	Japan	Other	No	No	Risk and correlation factors should reflect economic reality. Correlation should be validated and adjusted based on 2016 Field Testing data, and qualitative judgement of the IAIS based on such data should be taken into account.
Great Eastern Holdings Ltd	Singapore	Other	No	Yes	
Swiss Re	Switzerland	Other	No	No	The factors seem reasonable as a standard approach for primary insurers. For reinsurers a general answer cannot be given, as this depends significantly on the business composition of the individual reinsurer. The best approach for solving this issue is through the allowance of regulatory approved internal models for reinsurers.

RAA	United States and many other jurisdictions	Other	No	No	The correlation factor appears high. The risk and correlation factors should be carefully selected and calibrated based on empirical studies of available historical data and information collected in future field testing.
CNA	USA	Other	No	No	The approach is reasonable, but some level of validation based on empirical data would be appropriate.

Q146

Q146 Section 6.10.4.2 Is the 25% correlation factor between regions appropriate for the ICS standard method? If “no”, please provide rationale and alternative suggestions supported by evidence.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	No	A 25% correlation factor between regions seems overstated even taking into account tail behaviour of common drivers such as inflation and economic growth. Pragmatically speaking we feel a 12.5% correlation factor would be a more appropriate factor.
EIOPA	EIOPA	IAIS Member	No	Yes	
BaFin	Germany	IAIS Member	No	Yes	
Financial Supervisory Service	Korea	IAIS Member	No		It is difficult to assess the appropriateness of the correlation at the moment. Korean FSS plans to calibrate the correlation based on Korean Insurance market in the near future and the appropriateness of the correlation can be assessed afterwards.
National Association of Insurance Commissioners	USA	IAIS Member	No	Yes	We would welcome and be happy to contribute to further empirical work on this matter.

Ageas	Belgium	Other	No	Yes	
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	No	Further work to compare and supply specific suggestions with evidence is needed to validate the correlation factor selections. This should be considered at the same time as the granularity of reporting segments.
Canadian Institute of Actuaries	Canada	Other	No	Yes	
Insurance Europe	Europe	Other	No	No	Further work to compare and supply specific suggestions with evidence is needed to validate the correlation factor selections. This should be considered at the same time as the granularity of reporting segments.
Allianz	Germany	Other	No	No	We believe that the correlation used for EU and US is appropriate. However, the factors used for all other regions should be lower.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	No	The correlation used for EU and US seems appropriate. However, the factors used for all other regions should be lower.
Munich Re	Germany	Other	No	No	Further analysis of empirical data is needed for a proper calibration.
International Actuarial Association	International	Other	No	No	See our response to question 151. The 25% correlation factor between major regions is a reasonable starting point, but the value could be calibrated (or at least tested) based on data collected in 2016 Field testing. We suggest IAIS test the HHI approach and Max Line % approaches, as described in response to question 151.

General Insurance Association of Japan	Japan	Other	No	No	Risk and correlation factors should reflect economic reality. Correlation should be validated and adjusted based on 2016 Field Testing data, and qualitative judgement of the IAIS based on such data should be taken into account.
Great Eastern Holdings Ltd	Singapore	Other	No	Yes	
Swiss Re	Switzerland	Other	No	No	The factors seem reasonable as a standard approach for primary insurers. For reinsurers a general answer cannot be given, as this depends significantly on the business composition of the individual reinsurer. The best approach for solving this issue is through the allowance of regulatory approved internal models for reinsurers.
RAA	United States and many other jurisdictions	Other	No	No	The risk and correlation factors should be carefully selected and calibrated using empirical studies of available historical data and information collected in future field testing.
CNA	USA	Other	No	No	The approach is reasonable, but some level of validation based on empirical data would be appropriate.

Q147

Q147 Section 6.10.4.3 Is there a methodology that the IAIS could use for the calibration of Premium and Claims Reserve risk factors that can be easily and consistently applied across jurisdictional lines of business using the supplementary data requested in 2016 Field Testing? If “yes”, please provide specific details, technical references and rationale. Please indicate if some methods are more appropriate for particular segments or particular types of data.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	C-ROSS has accumulated relatively sufficient and credible non-life industry data during the development of C-ROSS, and has considered the results of least square estimation, maximum likelihood estimation, UPR bootstrapping and combined ratio analysis, using past 10-year's China market data, in calibrating the risk factors. Therefore we suggest ICS reference C-ROSS in setting ICS China risk factors.
EIOPA	EIOPA	IAIS Member	No	Yes	The methodology developed for the calibration of the standard parameters in Solvency II has proved itself robust enough for different lines of business and is easily implementable. Please refer to the following report: https://eiopa.europa.eu/Publications/Reports/EIOPA-11-163-A-Report_JWG_on_NL_and_Health_non-SLT_Calibration.pdf
BaFin	Germany	IAIS Member	No	Yes	The calibration used for Solvency II could be used.
Financial Supervisory Service	Korea	IAIS Member	No	No	

KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	https://eiopa.europa.eu/Publications/Reports/EIOPA-11-163-A-Report_JWG_on_NL_and_Health_non-SLT_Calibration.pdf
National Association of Insurance Commissioners	USA	IAIS Member	No	Yes	From work on our own capital requirement, we have found that applying straightforward statistical techniques to company reporting can provide consistent factors. We will be taking an active role within the CSFWG in the calibration of the ICS factors and applying lessons from our decades of experience calibrating NAIC RBC.
Ageas	Belgium	Other	No	No	Historical information used to derive risk factors is generally not consistent across lines of business and across countries, this already been concluded in the Solvency II exercise. Historical data should be in a Best estimate view and not based on a reporting. Evolution of portfolio and underwriting cycle make the data's non consistent across time and entities. All these effects should be isolated but as first step, we don't see which other approach should be applied easily. We do hope that Solvency II will evolve with time together with ICS
Canadian Institute of Actuaries	Canada	Other	No	Yes	Either the Mack Model on incurred losses or the Bootstrapping Model are widely used in many countries.
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	<p>We recommend that each country should set the factors with the same calibration method based on its own experience data. As a large amount of industry data were collected during the development of C-ROSS, and the industry data are quite stable, we suggest referring to C-ROSS for the related parameters.</p> <p>Motor insurance: The current premium risk factor of motor insurance is very high for business of China market and is not consistent with the actual situations of China auto insurance market. The premium risk factor of motor insurance is 25% in the field testing, which is close to the level of standard formula method under European Solvency II. However, according to the experience data of China, the average loss ratio of motor insurance for us from 2007 to 2013 is only 73% of that in UK and the standard deviation is only 44% of that in</p>

					<p>UK. Especially there is no limit for third party liability insurance in UK, while this is not the case in China due to low awareness of insurance. The average sum assured of the whole industry is only around RMB 440K for motor non-compulsory third party liability insurance (motor TP) on top of the average sum assured of around RMB 122K for motor compulsory third party liability (motor CTP), and only 72.4% of motor CTP policyholders buy motor TP. Therefore, we suggest calibrating the premium risk factor of motor insurance based on actual data of China and the calibrated result should be much lower than that of standard formula method under European Solvency II.</p> <p>Additionally, 25% is much higher than the risk factor of motor insurance under C-ROSS, which is less than 10%. The risk factor under C-ROSS is also calibrated to 99.5% VaR fully based on industry data of China. Therefore, we suggest lowering the premium risk factor of China motor insurance to 10%, by referring to the factor under C-ROSS.</p> <p>Liability insurance: Because of the low legal standards of compensation, low awareness of claiming and relatively low legal awareness, we think the risk of liability insurance in China is lower than that of other counties or areas, which could also be seen from the industry risk factor level under C-ROSS. As a result, we suggest it to be lowered to 15%.</p>
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	No	
Munich Re	Germany	Other	No	No	
International Actuarial Association	International	Other	No	No	There are a number of different approaches available. The "best choice" will be influenced strongly by the (non-)availability of data, which might well depend on markets and regions. See, for example, the considerations of EIOPA during the calibration of the standard formula of Solvency II (cf. EIOPA 11-163 Calibration of the

					<p>Premium and Reserve Risk Factors in the Standard Formula of Solvency II, Dec 2011, Sections 4.2 and 7), when a number of different approaches were considered, but in the end a premium-risk type approach has been preferred due to its consistency with the premium risk calibration. Actuarial work on the US RBC factors all use the “premium-risk type approach, for both premium risk and reserve risk.</p> <p>There are a number of additional topics to consider, e.g. the availability of net vs. gross data, some lines which are based on underwriting year triangles in some markets and the definition and accounting of catastrophes in the data set. One particular topic to point out is that there will be a need for an automated way of data cleansing, i.e. handling of outliers in the underlying data, in order to achieve reliable estimates for risk factors.</p> <p>We discuss this further in our response to question 151.</p>
General Insurance Association of Japan	Japan	Other	No	Yes	Based on the assumption that the difference between the projected and actual loss ratios of premium risk is a normal distribution, calculating a risk factor equivalent to 99.5% VaR should be applied.
Great Eastern Holdings Ltd	Singapore	Other	No	No	
National Association of Mutual Insurance Companies	United States	Other	No	Yes	The U.S. RBC approach utilizes a straightforward simplistic method. We would suggest coordination with the U.S. participants on the Insurance Capital Working Group would provide excellent ideas for a simplified method of calibration that has provided consistent, effective results for more than 20 years.
RAA	United States and many other jurisdictions	Other	No	Yes	This area of the ICS is too complex and should be simplified. While we do not have a specific recommendation on how to do this for version 1.0, the collection of premium and claims data in field testing may yield empirical data that would support a simplified approach to these risks. In addition, NAIC collects data by line of business to calibrate

					premium and reserve risk in the RBC formula using more than 20 years of historical data. This data and analysis may be helpful in developing more robust and supportable calibration of these risk factors.
--	--	--	--	--	---

Q148

Q148 Section 6.10.4.3 In the absence of adequate data, is there a way that the IAIS could determine appropriate Premium and Claims Reserve risk factors for lines of business. If “yes”, please explain.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	Yes	Using jurisdictional requirements (adjusted to a VaR 99.5%) as a basis combined with data from other LoBs which may exhibit similar characteristics and expert judgment.
China Insurance Regulatory Commission	China	IAIS Member	No	No	
EIOPA	EIOPA	IAIS Member	No	Yes	In such situation, results of internal models could be used to inform an appropriate calibration.
BaFin	Germany	IAIS Member	No	Yes	Results from internal models could be used. One could also try to use external data such as market data.
Financial Supervisory Service	Korea	IAIS Member	No	No	
KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	IAIS could use parameters from Solvency II regulation. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2015:012:FULL&from=en

National Association of Insurance Commissioners	USA	IAIS Member	No	Yes	Where data is not available, it could be a sign of reporting deficiencies or that the ICS segmentation is overly granular. Leaving that aside, the more data is inadequate, the more there is uncertainty (and therefore risk) within a segment. Factors from segments with adequate data should be used as proxies for these, though appropriate adjustments should be made to reflect the extra uncertainty.
Ageas	Belgium	Other	No	No	
Canadian Institute of Actuaries	Canada	Other	No	No	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	We suggest calibrating the stress levels based on the data of China market for risk types with sufficient data. We believe China data for Motor lines are very sufficient and credible. For other non-life business lines, if the data is not sufficient to achieve a reasonable level of calibration, we would accept the current stress levels, however, we recommend updating the experience data regularly and reflecting China experience data gradually into setting the stress levels.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	Yes	In the absence of data the IAIS could use data from local supervisors and local regulatory regimes (e.g. European supervisors should have data from Solvency II).
Munich Re	Germany	Other	No	Yes	Using data from local regulatory regimes (for EU: Solvency II).
International Actuarial Association	International	Other	No	No	Since regions as defined by IAIS do not coincide with jurisdictions, a direct transfer or averaging of risk factors from local jurisdictions to IAIS does not seem appropriate. In addition, local regulations may be so different that they could not serve as a consistent basis for international capital requirements. This being said, local factors or results from

					<p>companies internal models can always serve as a benchmark for final factors after these have been derived from a solid data basis.</p> <p>We discuss this further in our response to question 151.</p>
General Insurance Association of Japan	Japan	Other	No	Yes	Factors of similar segments within the same jurisdiction or the highest factor in the given jurisdiction could be applied.
Great Eastern Holdings Ltd	Singapore	Other	No	No	
American Academy of Actuaries	United States of America	Other	No	Yes	We suggest the use of local risk-based capital (RBC) factors or their equivalent, but it's worth noting that calibration to the VaR 99.5 percent 1-year view may not be standard in local RBC factors and will need to be calibrated.

Q149

Q149 Section 6.10.4.3 Is there a methodology that the IAIS could use to determine the appropriate number of buckets and factors, taking into consideration the context of the ICS standard method and the aim to achieve comparable results across comparable risks? Please explain.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	We view that the bucketing should firstly be able to cover the actual level of stress for each country, then be broadened to buckets for easier implementation. Some of China's mature business lines, for example Motor, has a risk factor (as calibrated in C-ROSS) significantly lower than the lowest bucket in ICS. We suggest ICS add lower buckets to cover these Chinese business lines.
Financial Supervisory Service	Korea	IAIS Member	No	No	
Ageas	Belgium	Other	No	No	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	The bucketing should reflect the actual level of risk calibrated in the first place and secondly enable mapping different lines of business of different countries into designed buckets. As described in Q147, the actual experience and corresponding risk factors of some mature business lines in China are much lower than the lowest risk factor level of the current buckets, and so the current buckets cannot cover these business lines of China. We therefore recommend that the number and the range of buckets be determined to properly cover the calibrated risk factors of all regions.

Allianz	Germany	Other	No	Yes	The number of buckets does not adequately represent our risk profile. Due to the reduced number of LoBs, we believe that either the correlations should be lower or the number of LoBs should increase. We recommend to not aggregate to ICS.NL. Categories but to use Solvency II LoBs instead.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	No	A determination would probably only be possible with an extensive collection and analysis of data from the companies.
International Actuarial Association	International	Other	No	No	There is no existing standardized methodology to do so. We propose to use the term of "homogeneous risk groups" as a basis for the definition of buckets. In doing so, data availability will be a limiting factor and statistical stability should be considered. The number of buckets used in local regulation can be used as a benchmark. We discuss this further in our response to question 151.
General Insurance Association of Japan	Japan	Other	No	Yes	In order to ensure comparability, an appropriate number of buckets that reflect the risks of each jurisdiction/segment should be set. The number of buckets and factors should be validated and adjusted based on 2016 Field Testing data.
Great Eastern Holdings Ltd	Singapore	Other	No	No	NA
Swiss Re	Switzerland	Other	No	Yes	The number of buckets seems reasonable for a standard approach. A regulatory approved internal model would enable a more precise approach, which is more appropriate for reinsurers.

Q150

Q150 Section 6.10.4.4 Are there practical methods for determining these adjustments in the context of the ICS standard method (considering, in particular, the trade-off between materiality of the impact and complexity of the method)? If “yes”, please provide details. If necessary please differentiate by risk and reporting segments.

Organisation	Jurisdiction	Role	Confidential	Answer	Answer Comments
China Insurance Regulatory Commission	China	IAIS Member	No	No	
EIOPA	EIOPA	IAIS Member	No	Yes	For catastrophe: an approach that could be followed is to view the premium risk analysis results at the initial stage and examine the time series of loss ratios for each undertaking separately. When such a time series shows a smooth flat or somewhat cyclic pattern this could be viewed as evidence of a catastrophe free experience for this undertaking. If on the other hand such a smooth pattern is distorted by a sudden upward outlying loss ratio, this could be viewed as an observation where the occurrence of a catastrophe is a real possibility. Subject to appropriate justification ,such observations could be removed.
BaFin	Germany	IAIS Member	No	Yes	A closer look on the time series of loss ratios could be followed to examine in how far a certain type of non-life risk is prone to catastrophe events.
Financial Supervisory Service	Korea	IAIS Member	No	No	

KNF - Polish Financial Supervision Authority	Poland	IAIS Member	No	Yes	Aggregated claims should be adjusted by CAT claims based on yearly reports of reinsurers (Swiss Re, Munich Re) reports on CAT losses.
Ageas	Belgium	Other	No	No	
Canadian Institute of Actuaries	Canada	Other	No	No	
Ping An Insurance (Group) Company of China Ltd.	China	Other	No	No	
International Actuarial Association	International	Other	No	No	Again, there is no existing standardized methodology to do so. However it will be important to request attritional triangle data which is cleaned from catastrophes as far as possible. Automated ways for data cleansing have been developed, see EIOPA 11-163. We discuss this further in our response to question 151.
General Insurance Association of Japan	Japan	Other	No	Yes	With regard to Premium risk, it is necessary to exclude catastrophes (such as natural disasters) from loss ratio data that are subject to the Catastrophe risk charge.
Great Eastern Holdings Ltd	Singapore	Other	No	No	
RAA	United States and many other jurisdictions	Other	No	Yes	The IAIS should collect historical claims data with and without catastrophe losses to attempt to avoid this double counting. Failure to eliminate this double counting will disproportionately and perhaps significantly overstate reinsurers' risk exposure in the ICS. The IAIS should consider that reinsurance contracts that only cover catastrophe risk will be

					subject to both a premium risk charge and a catastrophe risk charge, when the latter adequately captures the risk. Applying premium risk to these contracts is the best illustration of the double counting that will result if the IAIS fails to address this issue.
--	--	--	--	--	---

Q151

Q151 Section 6.10.5 Are there any further comments on Premium and Claims Reserve risks that the IAIS should consider in the development of ICS Version 1.0? If “yes”, please explain with sufficient detail and rationale.

Organisation	Jurisdiction	Role	Confidential	Answer	Resolution of comments
Property Casualty Insurers Association of America (PCI)	USA	IAIS	No	Yes	Yes. The factors for non-life Premium and Claims Reserve risks appear to be too high. With the revision we propose in our answer to Q.141, the factors would be even higher. We are aware that substantial calibration will be necessary to target the ICS capital requirement at any specific level, but these factors appear to be too high for even a 99.5% VaR level.
Bermuda Monetary Authority (BMA)	Bermuda	IAIS Member	No	Yes	It should be discussed within the calibration of premium risk whether the expected profits from next year's business should be allowed as a risk mitigating effect, especially for lines of business that are historically profitable.
China Insurance Regulatory Commission	China	IAIS Member	No	Yes	The premium risk factors is generally high for China, especially on Motor (C-ROSS 8.4% vs ICS 25%), Property and Liability. As answered in Q147, China has accumulated relatively sufficient and credible non-life data, and has performed 99.5% VaR calibration in the development of C-ROSS, so we suggest ICS reference C-ROSS risk factors. On Motor, ICS may has set China risk factors based on data that partially reflects the Motor insurance features of developed markets. China's Motor line often has a very limited liability coverage that are lower than the developed markets (unlimited vs very limited liability coverage), the risk factor is expected to be significantly lower in China,

Ageas	Belgium	Other	No	Yes	Impact of reinsurance: Reinsurance is the biggest mitigator of risks in non-life (large claims), unfortunately the impact of reinsurance cannot be assessed through the current methodology and don't promote the search for adequate reinsurance program. We do hope it will evolve with Solvency II.
ABIR Association of Bermuda Insurers & Reinsurers	BERMUDA	Other	No	Yes	Our overarching comment based on ABIR member internal analysis is that the current output from the Premium and Reserve risk module - considering exposures, risk calibrations and diversification - is over-specified to the order of 30% to 50% when compared against alternative standard formula regimes and more so as compared to internal model measurements. We are supportive of the data calls to attain better calibration data but we cannot support applying the current basis with the parameterization proposed in this year's Field Testing, as such an approach would be erring in a way that is destructive to the functioning of the industry.
Canadian Institute of Actuaries	Canada	Other	No	No	
Insurance Bureau of Canada	Canada	Other	No	Yes	<p>While we support the use of a factor-based approach to calculate Premium and Claims Reserve risks, we believe that the risk factors provided for 2016 Field Testing purposes, specifically the factors for the US and Canada segment, appear to be higher than would be expected under the ICS target criteria (ie VaR 99.5% confidence level).</p> <p>While we appreciate that the factors will undergo further refinement using data collected from Volunteer IAIGs, we recommend that the IAIS provide a reconciliation explaining the difference between the final ICS factors and those in currently used to calculate capital requirements in IAIS member jurisdictions. This is particularly important for jurisdictions where no Volunteer IAIGs participated in the Field Testing exercises, as is the case for the Canadian P&C sector.</p>

Ping An Insurance (Group) Company of China Ltd.	China	Other	No	Yes	We think the premium risk should be measured based on premiums of current financial year, rather than the maximum of current financial year earned premiums and next financial year earned premiums. From the perspective of the overall ICS framework, all the risks are measured based on the inforce business as at the valuation date. In other words, profits contributed by future new business are not considered in the calculation of capital resource. As a result, the measurement of the capital requirement should be consistent with the scope of business covered by the capital resource, in order to keep a consistent valuation system. Therefore, the capital requirement should be measured based on the business within the contract boundaries as at the valuation date, instead of taking the maximum of it and the business of next financial year.
Allianz	Germany	Other	No	Yes	The factors are considered to be very conservative. It should be taken into account that insurance groups with larger portfolios generate a high diversification within the portfolio, a large portion of retail business additionally adds to high diversification / lower volatility especially in the MTPL (motor third party liability) and general liability business. In addition diversification within LoBs within regions should be allowed for.
GDV - Gesamtverband der Deutschen Versicherungswirtschaft	Germany	Other	No	Yes	The proposed factors are considered to be very conservative. Large insurance groups generate a high diversification within the portfolio, a large portion of retail business additionally adds to high diversification / lower volatility especially in the MTPL (motor third party liability) and general liability business. In addition diversification within LoBs within regions should be allowed for.
German Association of Actuaries (DAV)	Germany	Other	No	Yes	For IAIG in Europe it seems adequate that the calibration of the ICS should lead to comparable results as under Solvency II, given that Solvency II is using the same Var 99.5% target as the ICS. It is worthwhile to mention that where the calibration is based on large – already implicitly diversified – portfolios, it is not adequate for small concentrated portfolios. As such the calibration is specific to IAIG and may need to be revised for potential application to insurance entities with a localized portfolio.

Global Federation of Insurance Associations	Global	Other	No	Yes	<p>Although we support a factor-based approach to calculating Premium and Claims Reserve risks, we believe the risk factors for a number of jurisdictions are higher than would be expected under the ICS target criteria (i.e. VaR 99.5% confidence level). While we appreciate that the factors will be further refined based on the results of the 2016 Field Testing, we recommend that the IAIS provide a reconciliation between the final risk factors and those currently in place in IAIS members' respective jurisdictions.</p>
International Actuarial Association	International	Other	No	Yes	<p style="text-align: center;">General Comments Related to Calibration Treatment of Non-Life premium and claim risk charges and diversification/correlation factor</p> <p>The CD includes a number of questions regarding the calibration of non-life diversification/correlation/dependency (questions 143-146) and calibration of risk factors (147-150).</p> <p>We have consolidated some general comments on these issues in this section. These comments represent only a number of important issues on this subject. The global actuarial community would appreciate the opportunity to further assist in the calibration of risk factors and dependency relationships, along the lines of how the actuarial community has assisted in the development of standard formulas in many jurisdictions.</p> <p>One over-arching observation is the recommendation that ICS should have as an objective, that ultimately all risk factors are calibrated based on data. Clearly, on day-one there will be factors based on expert judgement, but over time, it should be IAIS policy to collect data and test factors, such that the factors become increasingly data-driven.</p> <p>The following more detailed response has three parts. First, we comment on risk charge calibration. Second, we comment on dependency calibration. Finally, we provide an appendix with further details on risk charge calibration.</p> <p style="text-align: center;">1. RISK CHARGE CALIBRATION (NON-LIFE UNDERWRITING)</p> <p>Summary</p>

					<p>Based on our current knowledge, we recommend developing ICS risk factors from local jurisdiction standard formula calibrations, adjusted to the desired ICS safety level, adjusted to reflect the IAIG typical company size and perhaps other IAIG characteristics.</p> <p>Building risk factors on this basis will necessarily be affected by data availability. However, we are confident that building from existing calibration models can be applied in jurisdictions with the largest nonlife insurance premiums, including the US and EU.</p> <p>In applying this approach there are policy decisions and methodologies that can be applied widely, if not universally. The sections below illustrate some such aspects of the calibration for ICS.</p> <p style="text-align: center;">Use of ICS-specific factors</p> <p>We recommend developing ICS risk factors from local jurisdiction standard formula calibrations, adjusted to the desired ICS safety level, adjusted to reflect the IAIG typical company size and perhaps other IAIG characteristics.</p> <p>Our reasons include the following:</p> <ol style="list-style-type: none"> 1. Use of exiting work by jurisdiction is possible - We have high confidence that is possible for the US and EU, given the work done in those jurisdiction in RBC and Solvency Standard Formula (SF-SCR). It may also be practical in other jurisdictions 2. Time frames - ICS 1.0 and 2.0 have intended implementation dates of mid-2017 and mid-2018. Bespoke standard formula calibrations for nonlife premium and claim risk charges have generally taken much more time than is available for ICS. 3. Data adequacy – It is likely that IAIG data alone is not adequate for reliable calibrations; not enough companies to produce a data-driven result, for example. 4. Long term maintenance – Risk factors are not static. Underlying conditions change and methods of standard formula calibration improve. Factors developed from jurisdiction-based analysis can be kept up-to-date with far less effort than stand-alone ICS factors. 5. Raising global standards – An effort to adapt jurisdictional factors to fit the ICS framework may advance current practices in jurisdiction-specific risk factors, around the world, to the benefit of regulatory capital procedures at all jurisdiction levels. <p style="text-align: center;">Limitations</p>
--	--	--	--	--	--

				<p>We make our comments recognizing that modifications in the approach will be necessary for reasons that include the following: some jurisdictions have no standard capital formula; the calibration methods from some jurisdictions may not support the adaptation to the ICS approach; there are countries that are not now part of region-wide formulas, and separate country-specific formulas will need adjustments to reflect consolidation and geographic diversification within their ICS region.</p> <p>Relationship to Question 140 – In question 140, we reply that data should be applied by jurisdiction. One of our reasons for that reply was our view that calibrating factors should be done on that basis and that existing data to support the calibration is available on that basis.</p> <p style="text-align: center;">Target Safety Level</p> <p>Selecting the VaR is level is not a sufficient definition for premium and claim risk charges. Paragraph 293 indicates that IAIS is testing based on a VaR 99.5% target safety level. However, there are at least three ways to apply the VaR standard that standard: Percentile, Percentile minus Mean, and Standard Deviations. These applications produce different risk charges.</p> <ol style="list-style-type: none"> 1. Percentile Approach - In the percentile approach the risk charges are the operating losses or reserve runoff values at the selected safety level, e.g. 99.5%. This is the approach underlying actuarial recommendations related to the US RBC system. 2. Percentile minus Mean - The indicated risk charges could be determined as (a) the difference between the mean value operating gain/losses and reserve runoff and the operating gain/loss and reserve runoff at the target values at risk (e.g., 99.5th percentile). 3. Multiples of the standard deviations – This is based on determining the standard deviation (for a “typical” premium/reserve level -See discussion below of variation in risk by company volume) combined with an assumption regarding the number of standard deviations required to reach the VaR target level. <p>The differences between the methods include the following:</p> <ol style="list-style-type: none"> A. Treatment of Expected Profitability/Reserve Development One difference between the three methods is in the treatment of historical pattern of profitability and reserve adequacy. With respect to premium risk, profit margins are generally positive. In the percentile calibration approach the indicated premium risk factors are lower
--	--	--	--	---

					<p>than they would be otherwise, to reflect any such long term profit margin. The other two methods, the 'percentile minus mean' and 'standard deviation' approaches do not reflect that reduction.</p> <p>B. Similarly, with respect to reserve runoff, history shows that, in some business segments, companies tend to set loss reserves that are higher than ultimately prove necessary ("over-reserve"). Reserve runoff risk ratios those lines, therefore, tend to be lower, reflecting that favorable reserve development is likely. The opposite is the case for business segments where companies tend to set low loss reserves ("under-reserve"). In a percentile calibration, the 99.5th (or other safety level) percentile reserve runoff will be lower for the business segments companies tend to over-reserve and higher for the business segments where companies tend to under-reserve.</p> <p>C. The other two methods, the 'percentile minus mean' and 'standard deviation' approaches, assume that company reserves, on average across companies and over time are accurate for each business segment.</p> <p>D. Risk Distribution Assumptions. Another difference between the methods is that for "multiples of standard deviations," method it is necessary to specify at least certain features of a risk distribution. With the other methods a risk distribution might be specified, but the empirical data could also be used as the risk distribution, at least up to target level that can be calibrated based on data. The Solvency II Standard Formula uses the standard deviation approach.</p> <p><u>Recommendation:</u></p> <p>Different targets are used in different jurisdiction. Regardless of the approach used in the jurisdiction, the analysis underlying the jurisdiction factors can be adapted to the ICS target calibration.</p> <p style="text-align: center;">Calibration Issues</p> <p>The calibration of standard formula risk factors needs to address issues including the following:(See further details in sources such as: 1)Premium Risk Charges – Improvements to Current Calibration Method (Report 6) http://www.casact.org/pubs/forum/13forum/01-Report-6-RBC.pdf 2)Reserve Risk Charges – Improvements to Current Calibration Method (Report 7)</p>
--	--	--	--	--	---

				<p>http://www.casact.org/pubs/forum/14wforum/Report-7-RBC.pdf 3) Report of the Joint Working Group (JWG) on Non-Life and Health NSLT Calibration, December 2011, “Calibration of the Premium and reserve Risk Factors in the Standard Formula of Solvency II https://eiopa.europa.eu/fileadmin/tx_dam/files/Press-Room/releases/EIOPA-11-163-A-Report_JWG_on_NL_and_Health_non-SLT_Calibration.pdf1)</p> <ol style="list-style-type: none"> 1. Data cleansing - Data must be “cleansed” to remove anomalous values. 2. Size - Indicated risk factors vary by company based on the volume of premium and reserves, by company and business segment. The standard formula does not reflect that variation. Therefore, risk by size must be analyzed to select risk charges that are sufficiently acceptable for the purposes of the standard formula. 3. Years of Experience - Indicated risk varies by year, so the data must include a sufficient time period, in particular enough underwriting cycles and/or adjust for the gap in the experience period. 4. Reinsurance - The treatment of reinsurance in the calibration data should be consistent with the use of reinsurance in the standard formula or else adjustments to indicated risk factors are necessary. 5. Minor Lines - In analysis of US data, we find that business segments within a company that are small compared to the company total size (“minor lines”) have higher indicated risk charges than the same business segments, of the same business segment-size, in companies where the business segment is more significant in business segment-size compared to company-size for all business segments. Minor line data must be treated properly to produce factors that are appropriate for the bulk of the companies against which the risk charges are applied (The proper treatment of minor lines data is particularly important for specialty lines like reinsurance and medical malpractice.) 6. Survivorship – Data from companies that are no longer in operation show higher risk factors than companies that continue in operation. To the extent practical, data should include those companies that have ceased operations. 7. Time Horizon – IAIS has selected a one year reserve runoff time horizon. To the extent practical, the calibration should assess the extent to which reserve runoff after one year, for companies with adverse runoff, e.g., runoff at the safety level threshold, have unbiased reserved development after year 1. US data shows that for companies at or above the 87.5th
--	--	--	--	--

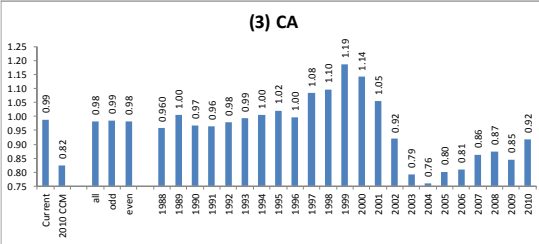
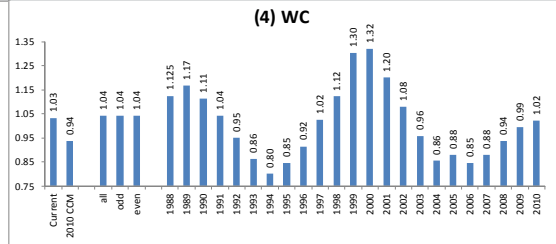
				<p>percentile of reserve runoff by line of business show adverse development, higher than other companies, after year 1.</p> <p>DEPENDENCY – NON-LIFE UNDERWRITING RISK</p> <p>ICS Approach in 2015 Public Testing Template</p> <p>The ICS standard method, as illustrated by the 2015 Public Testing Template contains four levels of potential diversification, applied in the order listed: (1) between premium risk and reserve risk (2) between 8 [to be determined] sub-line buckets, within each of the four major lines of business categories, (3) between 4 major lines of business categories; and (4) between the 8 major geographic regions.</p> <p>Alternative Approaches</p> <p>In our experience, we have observed four methods to reflect dependency in general insurance standard formulas:</p> <ol style="list-style-type: none"> 1. No explicit credit for diversification. Select risk factors that reflect the average degree of diversification. This approach is used (1) explicitly, in the UK Individual Capital Adequacy Standard; (2) implicitly in the US RBC treatment of geographic diversification variation within the US; (3) implicitly in Solvency II treatment non-catastrophe geographic variation within the EU (4) in Canada's current Minimum Capital Test (MCT) and within each of the major global regions worldwide. This approach appears to be the intended treatment for the diversification between the 8 [to be determined] subline buckets within each of 4 major lines of business categories and for countries/sub-regions in the major geographic regions. 2. Herfindahl- Hirshman-Index (HHI) –HHI is widely used by economists to measure concentration. HHI considers the relative proportions of all lines of business, the largest, second largest, third largest, and so on (The HHI index equals the sum of the squares of the LOB shares of total. For example, if there is only one LOB, the HHI index is 1.0, and the diversification is $1 - \text{HHI} = 0\%$. With two lines split 25% and 75% HHI is 0.25^2 plus 0.75^2 or 0.625 With three lines split 50%, 25% and 25% the HHI index is 0.50^2 plus 0.25^2 plus 0.25^2 or 0.375.). Using HHI in a standard formula requires only one parameter, the maximum diversification allowed for a company with concentration approaching zero. As it requires only one parameter, HHI is, in that sense is simpler than the correlation approach
--	--	--	--	--

				<p>(see item 4) but more complex than the Max Line % Approach (see item 3). HHI is used in the Solvency II geographic diversification credit between global regions.</p> <p>3. Simplified HHI (Max Line %) – HHI as described in item 2 above considers the proportion of business in each sub-category. HHI is sometimes simplified and applied to a subset of categories, e.g., the largest single category, or just the two largest categories, or just the three largest categories, etc. (In the simplified HHI, the index equals the sum of the squares of the desired proportions divided by the sum of the values. If there are three lines of business, with 50%, 125% and 25% shares and HHI uses only the two largest lines of business, the simplified HHI would be 0.50^2 plus 0.25^2 divided by 0.5 plus 0.25 or .41). US RBC uses the simplified HHI method, considering only the proportion of volume in the largest line of business for the company. The RBC method is sometimes called Maximum Line % approach, where the diversification credit equals the percentage of premium or reserves in the line with the highest share of business (Max Line % produces a diversification value that is less than or equal to than HHI diversification value. For example, if there is only one LOB, the HHI index is 1.0 with same as the Max Line %. In that case the diversification is 1- the index or 0% for both. With two lines split 25% and 75% the HHI index is 0.625 (see parenthetical above) compared the Max Line % of 0.750, i.e., it shows less concentration/more diversification. With three lines split 50%, 25% and 25% the HHI index is 0.375 (see parenthetical above), less concentration/more diversification than the Max Line % of 0.5).</p> <p>4. Correlation Matrix – This is the approach used in Solvency II Standard Formula for diversification between lines of business. The Correlation Matrix approach is the one routinely used in individual company capital modeling. The structure of the ICS Public Testing Template is a correlation matrix approach, but the correlation parameters are constants, 25% for geographic diversification and 50% diversification between major lines of business.</p> <p>Research Findings</p> <p>Research (not yet published) by a Casualty Actuarial Society working party [the research being the responsibility of the working party members, not the authors' employers or the CAS] shows the following:</p> <p>They calculated the premium and reserve RBC values on for each US (re)insurer in 2010, using the correlation matrix approach and using the Max Line % approach, normalizing the two approaches to produce the same industry total RBC value. They find that the differences in RBC values are small (For 79%% of companies with 78% of premium and reserve RBC value, the premium and reserve RBC</p>
--	--	--	--	---

				<p>values are 5% for the two methods. The authors consider 5% small in light of the parameter uncertainty in the risk factors and in the correlation factors) company by company (An analysis of why the different methods produce similar results is beyond the scope of that research. However, three factors that contribute to the similarity are that (1) the diversification credits are necessarily the same (zero) for mono-line companies regardless of method and therefore close for concentrated but not mono-line companies, (2) after normalization to equalize the total RBC, the diversification credits are similar for both methods for the most diversified companies, and (3) the correlation matrix values are not highly varied).</p> <p>Comparing indicated diversification credits to the formula credits, the correlation matrix approach is not more accurate than the Max Line % approach, within categories of companies by size and level of diversification.</p> <p>It might appear surprising that the correlation approach is not “better” than the simple Max Line % approach. The research shows evidence that that “dependency” and “line of business risk charge” are not completely independent. To that extent, dependency, calibrated for a standard formula, reflects more than risk theory diversification. For example, a company concentrated in a single region might have lower loss ratios, less variability in loss ratios, and more accurate reserving, due to specialization, than a company that was diversified across several geographic regions. A company concentrated in a single geographic region might be more diversified within that country than companies with business in several geographic areas.</p> <p>The research did not examine the dependency of premium risk and reserve risk.</p> <p>US data shows that the indicated diversification credit for larger and more diversified companies (like IAIGs) is reasonably linear with respect to the simplified Max Line % diversification metric, as assumed by the Max Line % approach.</p> <p>The advantage of the HHI or Max Line % approaches is that they require only one parameter, far fewer than the dozens/over 100 parameters potentially required by a “full blown” correlation matrix approach. It is more practical to calibrate the single parameter based.</p>
--	--	--	--	---

					<p>The ICS Template uses a small number of correlation values. Hence ICS calibration is also more practical than a “full blown” correlation approach, but with fewer different correlation values, the differences between HHI and correlation might be smaller.</p> <p>The Max Line % approach might be suitable for the 8 buckets within each major line of business and/or for country or other segments within the major geographic regions.</p> <p>Recommendation:</p> <p>IAIS should test the HHI approach as an alternative to the correlation matrix approach.</p> <p>*****</p> <p>Appendix – Examples of Issues Affecting Risk Factor Calibration</p> <p>Enough Years of Data</p> <p>Research in the US has shown that risk charges vary over time, as if in response to underwriting cycles that affect both loss ratios and reserve runoff ratios. For example, Table X-1 below shows the indicated 87.5th percentile loss ratios by year for US commercial auto and workers compensation.</p> <p>The risk charges vary from year-to-year by so much that 10 years of data, for example, is not sufficient to produce stable risk charges. It was not clear from US data what number of years is sufficient. Examining all available years appears to be the best practice.</p> <p style="text-align: center;">Table X-12 Variation in Indicated Premium Risk Factors By Year</p>
--	--	--	--	--	---

² Premium Risk Charges – Improvements to Current Calibration Method (Report 6)
<http://www.casact.org/pubs/forum/13forum/01-Report-6-RBC.pdf>
 Reserve Risk Charges – Improvements to Current Calibration Method (Report 7)
<http://www.casact.org/pubs/forum/14wforum/Report-7-RBC.pdf>

					<div style="display: flex; justify-content: space-around;"> <div data-bbox="943 295 1480 539"> <p>(3) CA</p>  <table border="1"> <thead> <tr> <th>Year</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Current</td><td>0.99</td></tr> <tr><td>2010 CCM</td><td>0.82</td></tr> <tr><td>all</td><td>0.98</td></tr> <tr><td>odd</td><td>0.99</td></tr> <tr><td>even</td><td>0.98</td></tr> <tr><td>1988</td><td>0.960</td></tr> <tr><td>1989</td><td>1.00</td></tr> <tr><td>1990</td><td>0.97</td></tr> <tr><td>1991</td><td>0.96</td></tr> <tr><td>1992</td><td>0.98</td></tr> <tr><td>1993</td><td>0.99</td></tr> <tr><td>1994</td><td>1.00</td></tr> <tr><td>1995</td><td>1.02</td></tr> <tr><td>1996</td><td>1.00</td></tr> <tr><td>1997</td><td>1.08</td></tr> <tr><td>1998</td><td>1.10</td></tr> <tr><td>1999</td><td>1.19</td></tr> <tr><td>2000</td><td>1.14</td></tr> <tr><td>2001</td><td>1.05</td></tr> <tr><td>2002</td><td>0.92</td></tr> <tr><td>2003</td><td>0.79</td></tr> <tr><td>2004</td><td>0.76</td></tr> <tr><td>2005</td><td>0.80</td></tr> <tr><td>2006</td><td>0.81</td></tr> <tr><td>2007</td><td>0.86</td></tr> <tr><td>2008</td><td>0.87</td></tr> <tr><td>2009</td><td>0.85</td></tr> <tr><td>2010</td><td>0.92</td></tr> </tbody> </table> </div> <div data-bbox="1480 295 2033 539"> <p>(4) WC</p>  <table border="1"> <thead> <tr> <th>Year</th> <th>Value</th> </tr> </thead> <tbody> <tr><td>Current</td><td>1.03</td></tr> <tr><td>2010 CCM</td><td>0.94</td></tr> <tr><td>all</td><td>1.04</td></tr> <tr><td>odd</td><td>1.04</td></tr> <tr><td>even</td><td>1.04</td></tr> <tr><td>1988</td><td>1.125</td></tr> <tr><td>1989</td><td>1.17</td></tr> <tr><td>1990</td><td>1.11</td></tr> <tr><td>1991</td><td>1.04</td></tr> <tr><td>1992</td><td>0.95</td></tr> <tr><td>1993</td><td>0.86</td></tr> <tr><td>1994</td><td>0.80</td></tr> <tr><td>1995</td><td>0.85</td></tr> <tr><td>1996</td><td>0.92</td></tr> <tr><td>1997</td><td>1.02</td></tr> <tr><td>1998</td><td>1.12</td></tr> <tr><td>1999</td><td>1.30</td></tr> <tr><td>2000</td><td>1.32</td></tr> <tr><td>2001</td><td>1.20</td></tr> <tr><td>2002</td><td>1.08</td></tr> <tr><td>2003</td><td>0.96</td></tr> <tr><td>2004</td><td>0.86</td></tr> <tr><td>2005</td><td>0.88</td></tr> <tr><td>2006</td><td>0.85</td></tr> <tr><td>2007</td><td>0.88</td></tr> <tr><td>2008</td><td>0.94</td></tr> <tr><td>2009</td><td>0.99</td></tr> <tr><td>2010</td><td>1.02</td></tr> </tbody> </table> </div> </div> <p>Values are 87.5th percentile loss ratios by year. 87.5th percentile reserve runoff ratios and standard deviations for both premium and reserves also show wide variations by year.</p> <p>We expect that similar variation from year to year would apply at higher percentile levels, although data at the 99.5th percentile is too sparse to allow year-by-year analysis.</p> <p>Company Business segment size</p> <p>Risk is affected by the company size and business segment size, measured as premium or reserves. The actual risk for large business segments within a company is lower than actual risk for the same business in another company with less volume.</p> <p>However, risk charges in standard formulas, generally, do not do not vary by business segment-size. Hence, smaller business segment-sizes there is a greater chance of exceeding any target loss or reserve runoff ratio than is the case for larger business segment-sizes. Hence, regardless of the calibration method, smaller business segment-sizes will have lower implied safety level and larger business segment-sizes will have higher implied safety levels.</p> <p>This issue of risk variation by size of business segment may be less significant for IAIGs, as they are large, than it is for standard formulas applicable to companies of all size. We do not have the data to assess that. However, even large companies will have smaller business segments and this will be more applicable in jurisdictions with smaller insurance markets than jurisdictions with larger insurance markets.</p>	Year	Value	Current	0.99	2010 CCM	0.82	all	0.98	odd	0.99	even	0.98	1988	0.960	1989	1.00	1990	0.97	1991	0.96	1992	0.98	1993	0.99	1994	1.00	1995	1.02	1996	1.00	1997	1.08	1998	1.10	1999	1.19	2000	1.14	2001	1.05	2002	0.92	2003	0.79	2004	0.76	2005	0.80	2006	0.81	2007	0.86	2008	0.87	2009	0.85	2010	0.92	Year	Value	Current	1.03	2010 CCM	0.94	all	1.04	odd	1.04	even	1.04	1988	1.125	1989	1.17	1990	1.11	1991	1.04	1992	0.95	1993	0.86	1994	0.80	1995	0.85	1996	0.92	1997	1.02	1998	1.12	1999	1.30	2000	1.32	2001	1.20	2002	1.08	2003	0.96	2004	0.86	2005	0.88	2006	0.85	2007	0.88	2008	0.94	2009	0.99	2010	1.02
Year	Value																																																																																																																								
Current	0.99																																																																																																																								
2010 CCM	0.82																																																																																																																								
all	0.98																																																																																																																								
odd	0.99																																																																																																																								
even	0.98																																																																																																																								
1988	0.960																																																																																																																								
1989	1.00																																																																																																																								
1990	0.97																																																																																																																								
1991	0.96																																																																																																																								
1992	0.98																																																																																																																								
1993	0.99																																																																																																																								
1994	1.00																																																																																																																								
1995	1.02																																																																																																																								
1996	1.00																																																																																																																								
1997	1.08																																																																																																																								
1998	1.10																																																																																																																								
1999	1.19																																																																																																																								
2000	1.14																																																																																																																								
2001	1.05																																																																																																																								
2002	0.92																																																																																																																								
2003	0.79																																																																																																																								
2004	0.76																																																																																																																								
2005	0.80																																																																																																																								
2006	0.81																																																																																																																								
2007	0.86																																																																																																																								
2008	0.87																																																																																																																								
2009	0.85																																																																																																																								
2010	0.92																																																																																																																								
Year	Value																																																																																																																								
Current	1.03																																																																																																																								
2010 CCM	0.94																																																																																																																								
all	1.04																																																																																																																								
odd	1.04																																																																																																																								
even	1.04																																																																																																																								
1988	1.125																																																																																																																								
1989	1.17																																																																																																																								
1990	1.11																																																																																																																								
1991	1.04																																																																																																																								
1992	0.95																																																																																																																								
1993	0.86																																																																																																																								
1994	0.80																																																																																																																								
1995	0.85																																																																																																																								
1996	0.92																																																																																																																								
1997	1.02																																																																																																																								
1998	1.12																																																																																																																								
1999	1.30																																																																																																																								
2000	1.32																																																																																																																								
2001	1.20																																																																																																																								
2002	1.08																																																																																																																								
2003	0.96																																																																																																																								
2004	0.86																																																																																																																								
2005	0.88																																																																																																																								
2006	0.85																																																																																																																								
2007	0.88																																																																																																																								
2008	0.94																																																																																																																								
2009	0.99																																																																																																																								
2010	1.02																																																																																																																								

				<p>Selecting risk factors is a balance³ between the following:</p> <p>“Company view” – the share of insurers that meet the target security level by business segment. This could be called “unweighted portfolio view.”</p> <p>“Policyholder view” – the share of premium or policyholders (or share of reserves or claimants in the case of reserve risk) that are insured with companies that meet the target security level by business segment. This could be called “weighted portfolio view.”⁴</p> <p>As larger business segment-sizes generally indicate lower UW variability than smaller business segment-sizes, the RBC and SF_SCR Formulas achieve higher safety levels from the Policyholder View than from the Company View.</p> <p>We can see the relationship between risk charges and size looking at indicated risk charges by size. For example, Table X-2 shows the indicated PPA premium and reserve risk charges decrease with increasing business segment-size.⁵ The solid lines, with diamonds show the indicated risk charges by business segment-size. The risk charge for the smallest 15th percentile business segment-sizes, the left-most point on the chart, shows an indicated reserve risk charge of over 40% for premium and over 50% for reserves.</p> <p>The horizontal line represents the risk factor indicated by excluding the smallest 15th percentile business segment-size, by year. That is another approach to addressing the “size” issue.</p> <p style="text-align: center;">Table X-26 – PPA</p>
--	--	--	--	--

³ This issue, called “Compliant Share” in Solvency II. The Solvency II perspective is described in Report of the Joint Working Group (JWG) on Non-Life and Health NSLT Calibration, December 2011, “Calibration of the Premium and reserve Risk Factors in the Standard Formula of Solvency II, page 1’8.”

⁴ The terms Company View and Policyholder View are from JWG. We recognize that premium and claim reserves reflect many variables in addition to the number of policyholders and claimants. These might be called the weighted portfolio method (Policyholder view) and unweighted portfolio method (Company View). . We believe the reference is useful as a non-technical way to express an important element of the two ways to view the calibration standard.

⁵ These are the 87.5th percentile loss ratios and runoff ratios, based on a lower calibration target than intended for ICS. The concept is applicable to higher safety levels.

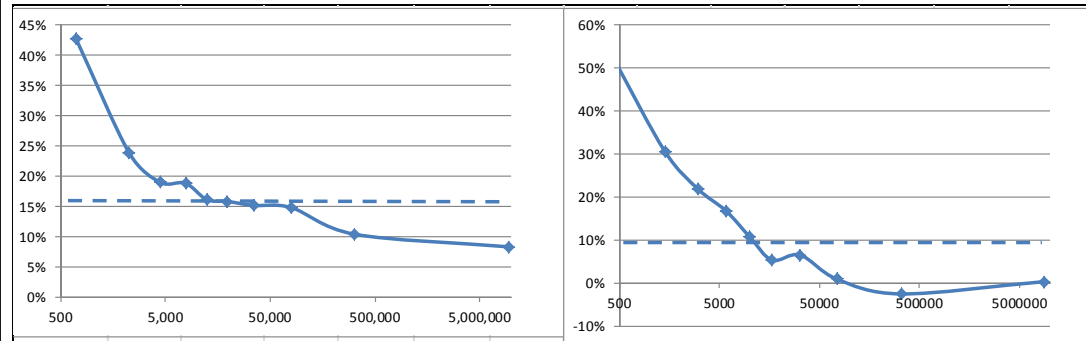
⁶ Adapted from data used in Report 6 and Report 7, referenced in footnote 2.

Graphical Representation of Risk Charge as % of Premium and Reserves

Variation by business segment-size (000's)

Indicated Premium Risk Charge

Indicated Reserve Risk Charge



We can also see the relationship examining the risk by size based on modeling.

Tables X-3 and x-4 show results for the US general liability insurance and the US private passenger automobile liability business segments.

The diamonds and triangles represent the results of the “company model” and “industry model” of the Joint Working Group on Non-life and Health NSLT Calibration, developed for solvency II risk factor calibration and applied to US data. The squares represent the indicated risk charges by company size, comparable to the values in Tables X-2.

Table X-3

US Private Passenger Automobile Liability – Premium Risk Charges (9,787 data points)

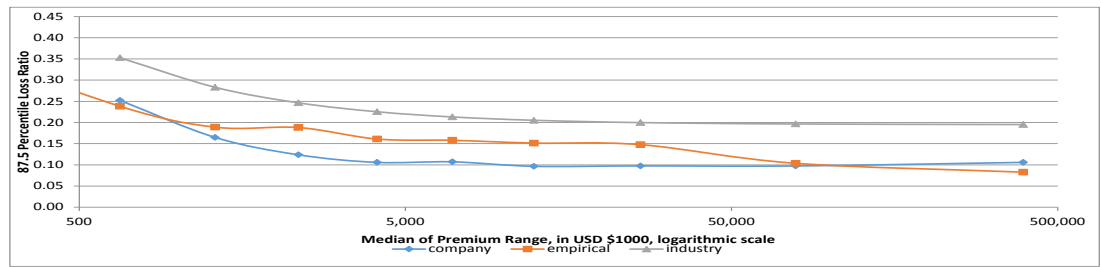
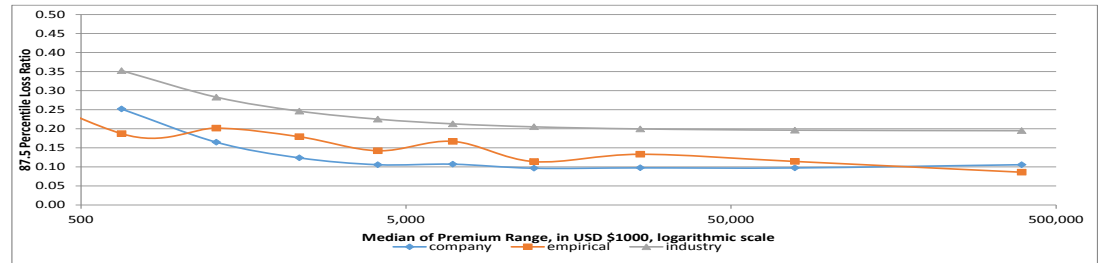


Table X-4

US General Liability– Premium Risk Charges (10,459 data points)



PARTIAL BIBLIOGRAPHY:

Premium Risk Charges – Improvements to Current Calibration Method (Report 6)
<http://www.casact.org/pubs/forum/13fforum/01-Report-6-RBC.pdf>

Reserve Risk Charges – Improvements to Current Calibration Method (Report 7)
<http://www.casact.org/pubs/forum/14wforum/Report-7-RBC.pdf>

					<p>Differences in Premium Risk Factors by Type of Company (Report 8) http://www.casact.org/pubs/forum/14spforum/01-RBC-Dependencies-Calibration-Working-Party.pdf</p> <p>Differences in Premium and Reserve Risk Charges by Ceded Reinsurance Usage (Report 9) http://www.casact.org/pubs/forum/14forumv2/DCWP__Report.pdf</p> <p>Reserve Risk Charges – Standard Formula vs. Individual Company Assessments (Report 10) Winter 2015 forum http://www.casact.org/pubs/forum/15wforum/DCWP-Report.pdf</p> <p>RBC UW Risk Safety Levels – Actual vs. Expected (Report 11) http://www.casact.org/pubs/forum/16wforum/DCWP-Report.pdf</p> <p>Calibration of the Premium and reserve risk Factors in the Standard Formula of Solvency II, Report of the Joint Working Group on Non-Life and Health NSLT Calibration, 12 December 2011 https://eiopa.europa.eu/fileadmin/tx_dam/files/Press-Room/releases/EIOPA-11-163-A-Report_JWG_on_NL_and_Health_non-SLT_Calibration.pdf</p> <p>Financial Condition Reporting for South African Short Term Insurers, Calibration Project, December 2005 https://www.fsb.co.za/Departments/insurance/archives/Documents/Amended%20Deloitte%20Recalibration%20report.pdf</p>
General Insurance Association of Japan	Japan	Other	No	No	
Great Eastern Holdings Ltd	Singapore	Other	No	No	
Swiss Re	Switzerland	Other	No	Yes	The dependence between portfolios should not be seen as a property of the underlying business as it depends to a large extent on the applied reserving methods. The better suited the methods are for the

					sub-portfolios, the less dependency remains between them. Imposing a standard correlation matrix can significantly misstate the reserving risk. (c.f. Benjamin Avanzia, Greg Taylor, Bernard Wong: Correlations between insurance lines of business: An illusion or a real phenomenon? Some methodological considerations", 2015)
Institute and Faculty of Actuaries	UK	Other	No	Yes	<p>The document could make clear that the percentages provided are factors used as inputs into a calculation, and are not (nor are intended to be) representative of correlation coefficients. Ideally, they should be renamed, for instance as 'diversification factors'. This will mitigate the risk that Boards confuse the factors with correlation coefficients used in other models.</p> <p>Given the judgement required to calibrate correlation factors, it would be useful to understand the implied quantitative differences between the ICS and the Solvency II Standard Formula framework approaches to diversification. Notwithstanding the differences in methodology, it should still be possible to map the ICS factors to provide some quantitative insight on the proposed factor selection against the Standard Formula approach, and highlight material differences for further investigation.</p>
RAA	United States and many other jurisdictions	Other	No	Yes	<p>We believe the risk factors for premium and claims risk are higher than would be expected under the ICS target criteria of VaR 99.5% over one year. As noted in our comments above, risk and correlation factors should be carefully selected and calibrated using empirical studies of available historical data and information collected in future field testing. Double counting of premium and claims risk for catastrophe exposures on all contracts is a very significant concern for reinsurers.</p> <p>Our members believe that the current result from field testing indicates that the premium and reserve risks for non-life are overstated by 30 to 50% when compared against other standard formulas currently in use by other supervisors. Implementation of these premium and reserve risk factors would be harmful to the functioning of the industry.</p>
American Insurance Association	United States of America	Other	No	Yes	<p>Given that the IAIS is already discussing ICS Version 2.0 , it is prudent to provide further rationale as to why Internal Models should be an option and included:</p> <ul style="list-style-type: none"> • Internal models are both risk-sensitive and are tailored to the circumstances of each company. Risks will necessarily differ between one IAIG and another and as firms have very different geographical

					<p>footprints, offer a diverse range of products with differing terms and conditions and are operating in different legal and tax environments. The standard method will not be a true reflection of any one company.</p> <ul style="list-style-type: none"> • From a supervisory perspective, because the internal model is naturally tailored to the circumstances of each company and is a genuinely risk-sensitive approach, it is more likely to deliver the comparability of outcomes that the IAIS is looking for than the standard method, which can only produce an approximation of the risks on an insurer's balance sheet. • Internal Models can thus deliver both better supervisory insight for supervisors and protection for policyholders. • This approach could be supplemented with a standard method for those firms that do not have internal models.
Liberty Mutual Insurance Group	USA	Other	No	Yes	The IAIS continues to use a "factor-based approach" to evaluate premium and claims reserve risks. In general, factor-based models will not be granular enough to capture the varying risks at the lowest level of segmentation needed to produce an effective capital assessment. To be accurate a factor-based approach must be too granular to be feasible to implement.

End of Section 6.10