7.20 Aggregation / Diversification of ICS risk charges

Q150 Section 7.20 Is the correlation matrix being used for Market risk aggregation appropriate for ICS Version 2.0? If “no”, please provide rationale and alternative suggestions supported by evidence.

Organisation	Jurisdiction	Confidential	Answer	Answer Comments
China Banking and Insurance Regulatory Commission (CBIRC)	China	No	Yes	
European Insurance and Occupational Pensions Authority (EIOPA)	EIOPA	No	Yes	
Insurance Europe	Europe	No	No	Insurance Europe does not consider the overall diversification allowance in ICS to be sufficient. As noted in response to Q107, Insurance Europe believes the method for aggregating the interest rate risk charge between currencies is not appropriate, as correlations between interest rate risks in different economies will not be dependent on any insurance groups’ net long or short position in that currency. Any correlation should be based on observed market data, independent of insurance groups’ exposures. The correlation factor is also too onerous. Market data suggest that the correlation for interest rate risk between currencies is low. The current design of equity risk is the sum of level and volatility stress; however, this is significantly more onerous than the combined stress run of level and volatility. The simple sum ignores the interaction effects between the level and volatility impacts. The application of homogenous risk groups within the mass lapse stress for aggregation is

				too onerous. It is not realistic to assume that all policyholders can assess the money-ness of their individual contracts (using a valuation basis such as ICS) from the insurers' perspective and always act in ways that are most onerous to the insurer, rather than adhering their own needs or circumstances.
Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)	Germany - BAFIN	No	Yes	
Global Federation of Insurance Associations	Global	No	No	GFIA does not consider the overall diversification allowance in ICS to be sufficient. The interest rate risk charges for each currency are aggregated using a correlation matrix, using a 75% correlation between each pair of currencies that have net long or net short duration in both currencies, and a negative 75% correlation in each pair of currencies for which one of the durations is net long and the other is net short. GFIA takes the view that this method is not appropriate, as correlations between interest rate risks in different economies will not be dependent on any insurance group's net long or short position in that currency. Any correlation should be based on observed market data, independent of insurance groups' exposures. The correlation factor is also too onerous. Market data suggests that the correlation for interest rate risk between currencies is low. The current design of equity risk is the sum of level and volatility stress; however, this is significantly more onerous than the combined stress run of level and volatility. The simple sum ignores the interaction effects between the level and volatility impacts. The application of homogenous risk groups within the mass lapse stress for aggregation is too onerous. It is not realistic to assume that all policyholders can assess the money-ness of their individual contracts (using a valuation basis such as ICS) from the insurers' perspective and always act in ways that are most onerous to the insurer, rather than addressing their own needs or circumstances.

General Insurance Association of Japan	Japan	No	Yes	
Financial Supervisory Service (FSS) & Financial Services Commission (FSC)	Korea (Republic of)	No	Yes	
Legal & General	UK	No	Yes	We are comfortable with this, although note that there are logical inconsistencies with certain entries (i.e. some risks are positively correlated with both NDSR up and NDSR down).
Association of British Insurers	United Kingdom	No	No	The ABI does not consider the overall diversification allowance in ICS to be sufficient. The interest rate risk charges for each currency are aggregated using a correlation matrix, using a 75% correlation between each pair of currencies that have net long or net short duration in both currencies, and a negative 75% correlation in each pair of currencies for which one of the durations is net long and the other is net short. The ABI believes that this method is not appropriate, as correlations between interest rate risks in different economies will not be dependent on any insurance group's net long or short position in that currency. Any correlation should be based on observed market data, independent of insurance groups' exposures. The correlation factor is also too onerous. Market data suggests that the correlation for interest rate risk between currencies is low. The current design of equity risk is the sum of level and volatility stress; however, this is significantly more onerous than the combined stress run of level and volatility. The simple sum ignores the interaction effects between the level and volatility impacts. The application of homogenous risk groups within the mass lapse stress for aggregation is too onerous. It is not realistic to assume that all policyholders can assess the money-ness of their individual contracts (using a valuation basis such as ICS) from the insurers' perspective and always act in ways that are most onerous to the insurer, rather than addressing their own needs or circumstances.
National Association of Mutual Insurance Companies	United States	No	No	Aggregation/diversification risk and all other risks and their factors should be determined by the local jurisdictional supervisor. NAMIC disagrees with the mandate of a standard method,

				the 99.5% VaR calibration level and the IAIS dictating the factors to be used in the formula. Jurisdictional flexibility is the appropriate way to capture these risks with mutual recognition and shared understanding of the jurisdictional approach at supervisory colleges. The ICS is not yet fit for purpose. Significant additional work is needed to achieve an appropriate global capital standard and it may be completely unachievable.
Prudential Financial, Inc.	United States of America	No	No	
MetLife, Inc	USA	No	No	It is difficult to determine how the correlation matrices were derived based on the values included in the table. The correlation matrices should be developed by looking at historical relationships that are updated on a regular basis. Providing additional information as to how the correlations were developed and what data was utilized to do so would enable better feedback on the design.
Property Casualty Insurers Association of America (PCI)	USA	No	No	PCI´s yes or no response was simply required in order to open the text box and file comments. We believe this question to be best addressed by field test volunteers who have the ability to do so with the benefit of actual data for support and context. The absence of a response by PCI should not be taken one way or the other with respect to the subject of the question.

Q151 Section 7.20 Are there any further comments on Aggregation and Diversification that the IAIS should consider in the development of ICS Version 2.0? If “yes”, please explain with sufficient detail and rationale.

Organisation	Jurisdiction	Confidential	Answer	Answer Comments

Canadian Institute of Actuaries	Canada	No	Yes	The IAIS should consider explicitly reflecting geographical diversification. The proposed correlation factors are significantly higher than those used in practice in the Canadian market. We recommend that the correlation matrices be reviewed.
CLHIA	Canada	No	No	The CLHIA believes that the absence of geographical diversification is a substantive flaw. Geographical diversification should be included. For example, the risk of mortality catastrophe occurring in the UK and the Philippines in the same year is low. Also, between-product diversification should be included. For example, for the morbidity risk, the incidence of excessive critical illness claims does not necessarily happen in the same period of excessive STD claims. A suggestion to calculate the "between product diversification" would be via a prescribed correlation matrix, as this would be 1) In line with the rest of the proposed ICS capital requirement methodology 2) Easy to implement The IAIS would come up with a correlation matrix for general product categories (e.g. annuities, individual life insurance, group life insurance, critical illness etc.), and that companies would group their products into the categories defined by the IAIS based on product design, then apply the prescribed correlation matrix.
China Banking and Insurance Regulatory Commission (CBIRC)	China	No	No	
European Insurance and Occupational Pensions Authority (EIOPA)	EIOPA	No	No	
Insurance Europe	Europe	No	Yes	Insurance Europe considers that the current approach is too simplistic for IAIGs, with the result that the approach has the potential to mis-state the diversified capital requirement by: • failing to capture the complexities of the correlations between risk modules and how they differ between insurers; • not allowing for non-linear interactions between risks; and • failing to appropriately capture tail dependencies between risks and increasing correlations. It is important that the approach taken in the ICS does not result in significant errors in

				aggregation, as this may inhibit insurers from adopting best practice in risk management within their businesses. There is limited recognition of diversification between countries, which is inappropriate for a standard designed for internationally-active groups.
Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)	Germany - BAFIN	No	No	
General Insurance Association of Japan	Japan	No	No	
Financial Supervisory Service (FSS) & Financial Services Commission (FSC)	Korea (Republic of)	No	No	
Legal & General	UK	No	Yes	We believe that matrix multiplication is an overly simplified method for allowing for diversification within large insurance firms, for the following key reasons: • Matrix multiplication does not allow for the potentially complex and material interaction between risks. • Matrix multiplication does not allow for the fact that the loss distribution on different risks may differ in shape across different levels of probability • More generally, matrix multiplication does not allow for losses on risks at percentiles other than 1-in-200 and therefore does not allow a full distribution of simulated losses to be generated and used for other purposes, or for validation of losses at the 1-in-200 level • Matrix multiplication requires approximations to be made to allocate capital between risks and products We do not believe that it is appropriate to add the operational risk capital allowance to the

				capital allowance on other risks without any allowance for diversification. Whilst there may be some link between losses on other risks and operational risk losses, there are also many scenarios that would generate operational risk capital independently of experience on other risks. This construction also means that operational risk is disproportionately influential on the ultimate level of required capital and MOCE compared to other risks. In terms of the correlations assumed between risks, we believe that an aggregation methodology where the most granular risk families are aggregated using one correlation matrix containing all risks (rather than the current approach a number of smaller matrix multiplications) would allow more meaningful correlations to be set between risks. The current specification requires assumptions to be set at the level of market, life and catastrophe rather than (for example) equity, property, mortality, longevity. One example of where this may not produce appropriate results is the assumption of 25% correlation between life and catastrophe risk. For an IAIG with a life risk profile dominated by mortality risk this would imply a 25% correlation between mortality and life epidemic, which would appear sensible. However, for an IAIG with a life risk profile dominated by longevity risk, a 25% correlation between longevity and life epidemic does not appear sensible but could still have a material impact. Otherwise the correlations as set appear broadly appropriate (including allowance for potential increases in dependency during the kind of tail events covered by required capital). If we were going to single out one correlation pair as looking counter-intuitive it would be the non-zero assumption between lapse and longevity. We think that exposure on these risks for the vast majority of IAIGs will arise on completely separate blocks of business and there will be no logical link between these risks at all. We are not aware of any data providing evidence of a link between these risks. Hence we believe that these risks should have 0% correlation assumed between them.
Association of British Insurers	United Kingdom	No	Yes	The ABI considers that the current approach is too simplistic for IAIGs, with the result that the approach has the potential to mis-state the diversified capital requirement by: (1) Failing to capture the complexities of the correlations between risk modules and how they

				differ between insurers. (2) Not allowing for non-linear interactions between risks. (3) Failing to appropriately capture tail dependencies between risks and increasing correlations. It is important that the approach taken in the ICS does not result in significant errors in aggregation, as this may inhibit insurers from adopting best practice in risk management within their businesses. The ABI notes that the internal model approach permitted under Solvency II addresses these issues successfully. The ABI notes there is limited recognition of geographical diversification between countries, which is inappropriate for a standard designed for internationally active groups.
National Association of Mutual Insurance Companies	United States	No	Yes	Aggregation/diversification risk and all other risks and their factors should be determined by the local jurisdictional supervisor. NAMIC disagrees with the mandate of a standard method, the 99.5% VaR calibration level and the IAIS dictating the factors to be used in the formula. Jurisdictional flexibility is the appropriate way to capture these risks with mutual recognition and shared understanding of the jurisdictional approach at supervisory colleges. The ICS is not yet fit for purpose. Significant additional work is needed to achieve an appropriate global capital standard and it may be completely unachievable.
RAA	United States and many other jurisdicitons	No	Yes	As with many questions in this consultation, this question is impossible to answer without access to aggregated field testing results.
American Academy of Actuaries	United States of America	No	Yes	The correlation matrix values for Catastrophe risk do not seem to match financial market assumptions. The demand for Insurance Linked Securities (e.g., “cat bonds”) is generally understood to be partly due to their lack of correlation with the overall financial markets. That would imply correlations of 0 percent rather than 25 percent.

Prudential Financial, Inc.	United States of America	No	Yes	The mortality/longevity correlation of -25% is unduly conservative and understates the natural hedge between the risks. Prudential Financial believes a correlation of -50% is more appropriate. Mortality and Longevity are two sides of the same risk, where the emergence of one cannot do anything but reduce the likelihood of the other. We believe the correlation should be higher (more negative) because tail risk scenarios are driven by major events or trends, which will be highly correlated across age groups, products, and countries. In addition, the correlation between expense and other insurance risks are excessive and should be investigated further.
MetLife, Inc	USA	No	Yes	One of the main aims of the ICS is to create a consistent risk-based capital measure for IAIGs who are globally active insurers. Hence, it is imperative that the ICS standard method reflect the risk profile of IAIGs and allow for appropriate diversification benefits. In contrast to insurers operating in one country or region, IAIGs carrying out business in different countries across the world are able to reduce their concentration of risks, and benefit from geographical and product diversification. We have grave concerns about the lack of diversification credit, especially within each risk type. IAIGs with a diversified portfolio will be seriously penalised by the non-recognition of geographical diversification and this means that the standard method is not an appropriate approach for calculating a global risk-based capital measure. Within equity risk, we note some improvement in the recognition of the diversification effect between equity segments. However, recognition for diversification between equity indices around the globe is still to be addressed. Additionally, it is assumed that the equity level shock and equity volatility shock is 100% correlated. However, these two shocks are likely to be only 60%-75% correlated. Similarly, within interest rate risk, we note some improvement in the allowance for diversification with a 75% correlation between each pair of currencies. With regard to insurance risk, there is no geographical diversification applied for life type risk or operational risk. For example, we would not expect to see a 40% decrease in lapse rates

				simultaneously for all lapse supported products around the globe. For Operational risk, when an operational risk event or loss occurs in one country/region, it is incorrect to assume that it occurs in all others as well. The operational risk ICS framework incorrectly treats OpRisk across geographies as fully correlated. We strongly suggest that the IAIS should consider a more granular aggregation approach that takes into account a realistic level of intra-risk geographical diversification as well as diversification across different risk types (for example, there should be very little correlation between insurance risk and market risk).
Property Casualty Insurers Association of America (PCI)	USA	No	Yes	PCI´s yes or no response was simply required in order to open the text box and file comments. We believe this question to be best addressed by field test volunteers who have the ability to do so with the benefit of actual data for support and context. The absence of a response by PCI should not be taken one way or the other with respect to the subject of the question.

End of Section 7.20