

EIOPA Report on the fifth Quantitative Impact Study (QIS5) for Solvency II

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Executive Summary

A. Background to Solvency II and the fifth quantitative impact study

Solvency II is a regulatory project that provides a risk-based, economic-based and principle-based framework for the supervision of (re)insurance undertakings. It acknowledges the main characteristics of the (re)insurance sector by building upon them. In Solvency II, capital requirements will be determined on the basis of the risk profile of undertakings, as well as on the way in which such risks are managed, therefore providing the right incentives for sound risk management practices and enhanced transparency.

Solvency II is a long-term project that started more than ten years ago, building a reference regulatory framework that will apply both in normal and crisis circumstances, from 2013 onwards. During its development relevant lessons from the last financial crisis have also been incorporated: the fifth Quantitative Impact Study (QIS5) takes into account a number of lessons learned from the recent financial crisis.

The design of the framework relies on technical provisions which allow undertakings to meet their commitments towards policyholders arising from the (re)insurance activity (i.e. the expected obligations), and capital requirements which should cover unexpected losses over a one-year time horizon. Undertakings will have to hold sufficient financial resources to absorb losses and to meet the risks: basic own funds and ancillary own funds will be classified into three tiers depending on their permanent availability and their subordination, ensuring that most resources are of the highest quality.

A supervisory ladder of intervention is embedded in the system, by setting two target levels of capital: the Minimum Capital Requirement (MCR) and the Solvency Capital Requirement (SCR). Whereas the Solvency Capital Requirement incentivises sound risk management through the explicit quantitative measurement of the risks for the undertaking's operations and investments, the Minimum Capital Requirement should ensure a supervisory response to the degradation of the undertakings' financial position, allowing for ultimate supervisory action, including withdrawal of the license. The framework is completed with the existence of a number of dampeners, both quantitative and qualitative, that aim to address potential procyclical effects of the regime.

Fully in line with the requirements of risk-based supervision and regulation, Solvency II removes the implicit prudence embedded in technical provisions currently existing in Solvency I, and provides with a fully comprehensive approach to (quantifiable) risks within the SCR standard formula, as compared to the simplistic factor-approach taken for the determination of the required solvency margin in Solvency I.

The starting point of the solvency assessment under Solvency II is the harmonised solvency balance sheet valued according to market consistent principles. This harmonised balance sheet differs from the one in the audited accounts used under Solvency I.

The total balance sheet approach requires a consistent valuation of assets and liabilities. This approach implies that where adjustments are being made to one of the balance sheet items under Solvency II, this will affect the overall solvency position of the undertaking, measured by the net asset value (assets minus liabilities).

The most immediate difference is the average increase of the level of own funds as compared to Solvency I due to a simultaneous decrease of technical provisions and, depending on the current accounting GAAPs applied in participating countries, an increase in the values of assets.

At European level the SCR increases when compared to the current required solvency margin of the Solvency I system, with the Minimum Capital Requirement (MCR) in Solvency II being below or close to the required solvency margin under Solvency I.

Furthermore, providing the right incentives for better risk management is paramount to the system. Sound risk management is incentivised in Solvency II through for example the possibility for undertakings to use undertaking-specific parameters (USP), the recognition of diversification benefits and risk mitigation techniques or the allowance, for the calculation of regulatory capital, of partial and full internal models, subject to supervisory approval.

Due to these differences, Solvency I and Solvency II, being designed differently, cannot be simply compared without acknowledging such differences.

QIS exercises are crucial to the development of EU regulation. QIS5 is the fifth in the sequence and probably the last fully comprehensive exercise. The QIS exercises are essential to strive to ensure that Solvency II is designed in the most appropriate manner, with sufficient evidence of the impact of the regime proposed.

We note that QIS5 is a field test and not a proposal for the final Solvency II framework. Furthermore caution should be exercised when drawing conclusions from the figures given in this report, since the comparability of results has in some cases been impacted by differences in the interpretation of requirements and by the short timescales in which data had to be provided.

Solvency II will not be a perfect system the day it enters into force, yet it will be a sound one, subject to improvements on the basis of new evidence. EIOPA, together with the European Commission and all relevant stakeholders, keeps working in full transparency on those areas where there is room for improvement. The findings of QIS5 will feed into the ongoing and future work for the Level 2 Implementing Measures that will put into practice the Solvency II Level 1 Framework Directive.

B. Participation rate

In its Call for Advice to CEIOPS, the European Commission has set out an ambitious target participation rate of 60% for solo undertakings and 75% for insurance groups. Once again, thanks to the continuous close cooperation of European trade associations, long-time stakeholders and the efforts of national supervisors EIOPA has outperformed these targets despite the tight time frame. Overall, EIOPA has witnessed through the QIS5 participation rate an increase of the attention to the Solvency II project.

Through five QIS exercises (and one preliminary field study) carried out in the last six years, the number of participants has increased steadily, to a point where today 68% of the (re)insurance undertakings that are likely to be under the Solvency II scope have participated in this exercise. Compared to QIS4, an overall increase of the participation of 78% can be observed.

- All 30 EEA member countries are represented in the scope of this study.

- In total, 2,520 (re)insurers as well as 167 groups have participated in this study, compared to 1,412 and 106 respectively in QIS4.
- In total, more than 95% of technical provisions and 85% of premiums of the insurers subject to Solvency II are covered by the test.
- It was especially notable that the number of small undertakings that took part in the study more than doubled compared to QIS4. This could also be observed in the increased participation of medium and small-sized groups.
- In particular, the increase in the participation of reinsurers should be pointed out.

This shows that EIOPA has succeeded in engaging with supervisors and industry in the regulatory and supervisory discussion, which will continue to benefit the implementation efforts in the future months. It indicates that Solvency II has become a priority to all insurers, regardless of size, and that (re)insurance undertakings and groups are striving to be ready for the implementation date of 1st January, 2013.

C. Financial impact

Surplus

Two main elements explain the financial situation of the (re)insurance industry resulting from the QIS5 field test at the end of 2009: the impact of the financial crisis and the difference between Solvency I and Solvency II solvency balance sheets.

It is a fact that the financial crisis was not originated by (re)insurers and that they have resisted much better than other financial institutions the effects of the crisis. However, it is also a fact that, since 2007 - the basis for the previous QIS4 exercise - the financial surplus of the insurance sector, calculated under Solvency I rules (i.e. neutral of any Solvency II implications) has decreased markedly in 2008 (minus €200bn), and was followed by partial recovery in 2009 - which constitutes the basis for the current QIS5 exercise. This evolution is largely explained by the impact of the financial crisis on the valuation of the assets owned by the sector. At the end of 2009, the capital surplus of the insurance and reinsurance industry totalled around €500bn compared to over €600bn at the end of 2007.

The results of QIS5 are also driven by the fundamental difference of valuation of the balance sheet and the meaning of the solvency requirements under Solvency II as explained above, which globally leads to an increase in capital requirements, a decrease in technical provisions and a relative increase in the amount of eligible own funds.

Taking into account these elements, the **financial position of the European (re)insurance sector assessed against the QIS5 solvency capital requirements calculated in accordance with the standard formula or internal models remains comfortable** with eligible own funds in excess of the regulatory requirements by €395bn. This amounts to a decrease of the surplus of €56bn compared to the current regime. On a global level, the surplus under QIS5 is roughly 12% lower than the current surplus.

On a national level, the evolution of the surplus is not homogeneous. In thirteen countries the capital surplus assessed against the QIS5 SCR is greater than the current surplus assessed against the Solvency I required solvency margin.

Generally, across all solo respondents the SCR results obtained by using an internal model were very close to those derived by applying the standard formula. The most significant difference between standard formula and (partial) internal model results was observed among groups. Groups' internal model results showed a capital requirement of about 0.8 times the size of the capital requirement based on the standard formula calculation.

Compared to Solvency I, for groups using the accounting-consolidation method with the QIS5 SCR standard formula calculation a reduction in the group surplus of around €86bn has been observed (from €200bn to €114bn), which represents a reduction of 43% compared to the Solvency I surplus. For groups that submitted internal model results, an increase in surplus of about €6bn has been observed when moving from Solvency I to QIS5, which represents an increase of 6%. However, it should be noted that there is a high variability in the results in this area.

On average, when groups applied the deduction & aggregation method, rather than the accounting consolidation-based method, there was a significant loss of surplus. This is due to the non-recognition of diversification effects.

For groups with entities located in non-EEA countries, results have shown a significant impact on the group overall surplus determined by the application of local rules instead of Solvency II rules when using the deduction aggregation method. Based on approximations, the overall positive impact of the use of local rules for non-EEA entities using this method is about €45bn.

Key indicators of the SCR shock and coverage of the SCR and MCR

The sum of all risks modelled under the SCR requirements calculated using the standard formula or full or partial internal models in QIS5 totalled more than €1300bn. Taking into account the reduction arising from diversification benefits recognised at solo level based on the correlations between the risks (€466bn) and the adjustment recognizing the undertakings' ability to reduce discretionary benefits or to pay less taxes after a stress (in total €314bn), this leads to the final SCR being a little above 41% of the sum of all risks modelled (€547bn).

On average, the main risk drivers of the SCR are the market sub-risks (equity, spread and interest rates) followed by the non-life underwriting sub-risks (premium and reserve risk and catastrophe risk).

At European level, 15% of the participants did not fully cover the SCR, which would trigger regulatory action. Fewer than 9% of participants covered 75% or less of the SCR. A quarter of those undertakings belong to insurance groups or financial conglomerates for which a capital reallocation or intra-group risk transfers would be available as a means for raising their capital level.

Just under 5% of the participants did not fully cover the MCR, which would trigger the most serious intervention from the supervisor, this is the withdrawal of the license.

D. Valuation of assets and liabilities, Own funds and Solvency Capital Requirement

Valuation of assets and liabilities excluding technical provisions

In Solvency II, assets and liabilities are being valued on a market consistent basis. It is the aim of Solvency II to make the valuation standards for supervisory purposes, to the extent possible, compatible with the international accounting developments so as to limit the administrative burden on undertakings.

QIS5 shows that there continues to be broad support for this economic valuation approach. Due to the alignment, within the limits of the Solvency II valuation principles, with international accounting standards, participants from countries where these standards are in use experienced little difficulty in applying the Solvency II valuation requirements.

But still, QIS5 has also outlined inconsistent valuations by participants, be it due to differences from IFRS or the inherent difficulty of applying mark-to-market valuation for all items. In the former case, participants from countries applying valuation on amortised cost bases reported more problems and some doubts about the reliability of the reported QIS5 balance sheet. In the latter case, participants who used mark-to-model valuation methods did not give much information on the actual techniques used. In general, small and medium undertakings faced difficulties where the current accounting basis differs significantly from IFRS.

There is wide variety in the way deferred taxes were recognised and valued. Deferred taxes seem to be the most difficult area in the valuation of assets and other liabilities, especially when it comes to recognizing that differed tax assets should be realisable within a reasonable time frame.

Other areas which have shown inconsistent treatments and different interpretations are the valuation of intangibles, participations, contingent liabilities, financial liabilities and employee benefits.

Technical Provisions

There continues to be an overall support, as it was the case with QIS4, for the basic design of the valuation technical provisions, consisting of the calculation of a best estimate and a risk margin.

At the same time, a number of areas have been identified that might need further development:

- The Risk Margin calculation, as provided by the full approach, seems overly complicated, leading to a very large use of the simplifications provided. Further guidance on simplifications will be needed for ensuring consistency in the calculation throughout Europe. EIOPA stands ready to undertake such work. As compared to QIS4, no major concerns have been raised with regards to the cost of capital factor (6%).
- The definition of the contract boundaries seems to be unclear. This leads to significant differences and a potential unlevel playing field. Further clarification

will have to be provided, taking into account to where relevant and appropriate the work undertaken by the IASB.

- QIS5 has provided the first opportunity to test the applicability of an illiquidity premium to the discount rate used for the calculation of technical provisions. Three different buckets to which different types of products had to be allocated have been tested. Supervisors have noted an inconsistent application of the buckets; either more and consistent guidance or a simple binary approach of 0/100% should be considered. The application of the premium leads to a reduction of 1% of the technical provisions on average.
- With regards to the segmentation by lines of business, in particular the second level of segmentation for the life business, the added value of this second level seems limited, particularly when compared to the complexity it adds to the system.

Own Funds

Participants reported a total amount of available own funds of €921bn. Close to 92% of this amount (€846bn) has been classified as being the highest quality Tier 1, which is unrestricted in its use to meet the capital requirements. This high classification of own funds has been a recurring feature of the previous QIS exercises (QIS3, QIS4).

QIS5 tested the application of Solvency II criteria for basic own funds under the scenario that no transitional provisions for the recognition of hybrid capital and subordinated debt would apply. Notwithstanding the identification by participants of transitional measures as a significant issue, they seem to have been optimistic in allocating existing hybrid capital and subordinated debt instruments under the aforementioned scenario. Therefore, the basis for comparing the situations with and without transitional provisions was undermined by incorrect and incomplete submissions.

Nevertheless, the amount of subordinated liabilities currently reported at the by QIS5 participants (€48bn at solo level; QIS4 around €42bn; €82bn at group level) gives a measure of the potential impact of transitional provisions.

QIS5 allowed for the assessment of the reconciliation reserve, which ensures that the value of all individual basic own fund items is equal to the total of excess of assets over liabilities and subordinated liabilities. The reconciliation reserve is part of Tier 1 own funds. At EEA level the positive value of the reconciliation reserve (€110bn) is driven by a reduction in technical provisions (€241bn), offset by a decrease in asset values and an increase in other liabilities and reduced by the adjustment for expected profits in future premiums (EPIFP) caused by the separate disclosure of the last item.

The own funds element constituted by expected profits arising from future premiums (EPIFP) is an important component of own funds, in particular for life and health insurers. In order to provide a quantification of EPIFP a proxy methodology was developed for QIS5 in liaison with industry bodies. A total amount of €83.7bn was reported. The weighted average of EPIFP for those participants that reported EPIFP amounted to 20% of Tier 1, and in some cases the amount of EPIFP in Tier 1 constituted 50% or more of the own funds, largely accounted for by large undertakings or groups. However, it needs to be pointed out that only a small number of participants carried out the calculation and there are wide variations in data among undertakings and countries. The qualitative comments indicate a range of difficulties

with the methodology on conceptual, interpretation or practical grounds. Hence these strong caveats mean the data from the sample cannot be safely extrapolated.

The discussion as to whether the risks attached to future cash flows contributing to the calculation of technical provisions is sufficiently captured in the capital requirements is not yet complete. A clear link also exists with the definition of contract boundaries in the valuation of technical provisions: the broader the contract boundaries, the more future cash flows would need to be taken into account in the calculation of technical provisions.

With regard to the adjustments to basic own funds as required by the Solvency II valuation, QIS5 further analysed the significance of ring-fenced funds on the overall level of own funds. As already reported in QIS4, the issue is of relevance for a number of undertakings in certain countries. QIS5 showed progress in the understanding and quantification of these funds. Nevertheless participants and supervisors would still need clarification about the identification and treatment of ring-fenced funds, which should lead to greater consistency in the calculation.

The identification of own funds in excess of the coverage of restricted reserves from Tier 1 led to the relegation of a significant amount of own funds to Tier 2 (€5.7bn). An important adjustment to Tier 1 was also made in respect of the deduction of participations in credit and financial institutions (€18.6bn). Finally, the adjustment for net deferred tax led to the relegation of an important amount assets from Tier 1 to Tier 3 (€9.6bn, or 56% of basic Tier 3).

With regard to ancillary own funds, the extent to which undertakings will seek to make use of these items other than supplementary calls by mutuals once Solvency II is implemented, remains to be seen. QIS5 provides some perspective on the potential contribution of ancillary own funds to the own funds, which might assist supervisory authorities in assessing the likely calls on resources for the approval process. Ancillary tier 2 own funds (representing items already permitted under Solvency I) amounted to €11.6bn, concentrated primarily in three countries.

Capital Requirements: SCR standard formula and MCR

There is broad support both from industry and supervisors towards the modular approach design in Solvency II. Also the aggregation approach has been well received. The system allows, through the use of correlations among and within the different modules, for the recognition of diversification effects to acknowledge that all risks cannot materialize simultaneously.

When looking at the correlations tested, and the changes within the correlations made by CEIOPS as compared to QIS4, very few comments were received. No major trends could be identified.

In terms of the composition of the SCR, market risk has the highest weight within the standard formula, particularly for life undertakings (67%). For non-life the main driver remains the non-life underwriting risk sub-module (>50%).

Market Risk

Market risk is the largest component of the standard formula, particularly in life, both before and after diversification. The main components within the market risk are equity, spread and interest rate risks.

Following the comments from participants, market risk is still subject to a level of complexity that could be reduced. The spread risk sub-module has also attracted most criticism within the market risk module, particularly due to its calibration (considered either too high or too low) and the complexity especially in the area of structured products. The look-through approach for structured products, but also for some investment funds or unit-linked products was deemed to complex by undertakings and supervisors.

The impact of the concentration risk is in line with the size of entities, with a higher impact for small and medium entities.

A large amount of participations were reported by participants (€377bn), in the majority of cases valued by using the adjusted equity method, but adopting other mark-to-model valuation mostly for large participations. Participants considered two-thirds of total participations to be of a strategic nature, attracting the application of a reduced charge of 22%. QIS5 did not specify the criteria for determining whether a participation is of strategic nature. Participants responded that in most cases the degree of control, the long-term nature of the participation as well as the involvement in the development of activities of the undertaking were considered of key importance to decide on the strategic nature.

The currency risk module was noted to contain counterintuitive incentives to hold assets in excess of liabilities in the reporting currency rather than in the currencies of the underlying liabilities.

Counterparty Default Risk

This module has been most commented upon, mainly with regard to the overly complex approach tested, which was not felt to be justified in terms of materiality. Additional work to complete the simplifications already provided in QIS5 should be carried out to make the module more workable.

In parallel to enhancing simplifications, the treatment of unrated counterparties has been perceived as disproportionate by undertakings, and more consistency with regard to the risk charges for the different types of exposures should be aimed for.

Life Underwriting Risk

The main risk drivers of this module include lapse and longevity risk.

This module has been well received both by industry and supervisors. The main area for improvement was identified in the lapse risk sub-module: not (as was the case in QIS4) regarding the amount but rather regarding the complexity of the calculation on a policy-by-policy basis.

Health Underwriting Risk

This is one of the areas where major changes have been made as compared to the QIS4 exercise, including among others the introduction of a methodology for health risk equalisation systems.

For undertakings primarily or solely underwriting health insurance, health underwriting is the main component in terms of capital requirements, with an average of 63%.

When looking at the sub-module for health business calculated with techniques similar to life insurance (SLT), a clear difference with regards to the key risk drivers between life insurance and health SLT insurance can be observed: disability (76%) is the main risk driver in health SLT, as compared to longevity and lapse in life. This justifies a different treatment for the two lines of business.

As it is the case in non-life, the standardised health catastrophe scenarios would benefit from additional work.

Non-Life Underwriting Risk

For non-life business, the key risk drivers are the number of claims and the potential mis-estimation of reserves, which are captured in the premium and reserve risk sub-modules. Lapse risk is a residual risk.

The non-life underwriting risk module has been criticised by industry mainly regarding the complexity of the catastrophe sub-module. The work on the catastrophe scenarios is already being carried out by EIOPA together with the industry.

Lapse risk has also been at the centre of attention, more specifically whether the materiality in some cases justifies keeping the sub-module. However removing this sub-module may well create wrong incentives in terms of selling practices in non-life. For that reason, the sub-module is appropriate and should be kept.

As previously indicated, strong concerns have been raised with regard to the catastrophe scenarios, in respect of the calibration, as well as the complexity and availability of data. None of the methods proposed was free of concerns, and further work is needed. This additional work should ensure that catastrophe scenarios are also suitable to all insurance business, including in particular credit and suretyship insurance, reinsurance and business written outside the EEA.

Operational Risk

Very few comments were made with regard to operational risk. Nevertheless, the answers from participants have shown that most undertakings would opt for the standard formula approach rather than to develop internal models for this specific risk. There may be different drivers for this trend such as the difficulties to develop such models (cost, complexity, timing), and this result needs to be viewed in light of the limited data available in QIS5 on internal models.

Undertaking-specific parameters

As Solvency II is a system designed to incentivise sound risk management, Undertaking-specific parameters (USP) are seen as a relevant part of such a system,

which allow, in the areas identified in the QIS5 (premium and reserve risk for non-life and non-similar to life techniques health, and revision risk for life and similar to life techniques health business), for replacing the standard formula risk parameters with parameters specific to undertakings. But for this approach to work, this has to be done in a sound and consistent manner, avoiding extending USP to all modules of the standard formula.

Due to time constraints issues or to a lack of data, not sufficient information has been collected on this area to consider the results to be representative.

There seems to be a clear consensus that USP should not be used to elude the requirements of partial internal models.

There is also a clear view from supervisors that USP for inflation should not be allowed, as this would make comparability more complicated.

Risk Mitigation

The Solvency II system is designed to allow for and incentivise risk mitigation techniques as part of a sound risk management policy. At the same time, it is not always easy to take this on board in the standard formula without adding too much unwanted complexity. The calculation of the adjustment for non-proportional reinsurance summarizes both issues, namely the need to allow for risk mitigation, and the complexity of the tested adjustment.

Loss absorbing capacity of technical provisions and deferred taxes

The loss absorbing capacity of technical provisions and deferred taxes captures the extent to which technical provisions would be reduced and deferred taxes would be affected (decrease of tax liabilities or increase of tax assets) in the event of a shock.

The impact of this loss absorbency is extremely important, potentially decreasing the BSCR of (re)insurers with more than one third. It should be noted that only around 60% of undertakings who took part in the QIS5 exercise calculated the loss absorbency adjustments for technical provisions or deferred taxes; this could mean that the SCR reported in QIS5 may be overstated for the undertakings which did not perform the calculation.

Another open issue refers to the potential limitations of the loss absorbing capacity of deferred taxes, and the fact that for groups there may be different tax regimes in different countries and restrictions on the availability of deferred taxes. EIOPA does not comment on the specific aspects of the tax regimes as these fall outside the scope of its mandate. Nevertheless, the aforementioned impact demands the utmost clarity with regard to methodology and calculation, and EIOPA stands ready, to work in that direction.

Minimum Capital Requirement

Following QIS4 testing, the MCR is designed on the basis of a combined approach that incorporates a corridor with a cap (45%) and a floor (25%) referring to the SCR, in order to ensure the functioning of the supervisory ladder of intervention. The corridor is complemented with an absolute floor MCR (AMCR) for life, non-life and health business.

The system has worked well, without relevant concerns on its functioning, with the exception of the way the AMCR is articulated for composites, which as required by the Directive consists of the sum of the AMCR for life and AMCR for non-life, and the resulting level of it (considered too high).

E. Internal Models

Due to the fact that most internal models have not been finalised yet and because of the small sample provided, no firm conclusions can be drawn on the comparison of the size of the capital requirements calculated by internal models and the standard formula. Furthermore, some undertakings that participated in this exercise are using internal model techniques which in EIOPA's opinion would not yet be in accordance with the Directive.

Various participants indicated that they would be applying to their supervisory authority to use an internal model to calculate the Solvency II SCR. Almost all undertakings that are part of a group (96% of the respondents to the qualitative questionnaire on internal models) are aiming to use the group internal model to assess their local SCRs as they consider it better matches their risk profile, subject to some deviations to adapt to local specificities. In many cases they indicated that they have already entered into the pre-application phase. However, at the same time, many of these undertakings have not submitted any qualitative nor quantitative data regarding their internal model.

In general, it seems that the scope of application of both partial and full internal models is still subject to some misinterpretations. For example, some participants reported that their internal model consists of changing only some parameters compared to the standard formula. Some others asserted that the scope of their internal model was full, although operational risk was not modelled. In the first case, the difference between an internal model and the use of undertaking-specific parameters needs to be upheld. In the second case, it is important to note that a full internal model should cover all material risks, or else it will be considered as a partial internal model subject to all relevant requirements.

The modules that the most participants indicate they plan replacing in a partial internal model are non-life underwriting risk (natural catastrophe risk and premium and reserve risk), market risk and life underwriting risk.

With regard to internal models' tests and standards, QIS5 has shown that the development stage of participants' internal models (group and solo) varies significantly.

Undertakings were strongly encouraged to provide both standard formula and internal model data to enable comparisons between these two sets of calculations. This included also the alignment of internal model results with the Solvency II standards (99.5% VaR over one year). Overall, 234 undertakings (about 10% of all participating undertakings) provided SCR results calculated by using an internal model in QIS5 (29 groups).

Keeping in mind the caveats mentioned above, on average the results still show lower capital requirements for undertakings intending to use internal models. However, in some cases results also show requirements that are higher than the standard formula.

For groups the impact of the use of an internal model seems to further reduce the capital requirements but similarly, no exact conclusions can be drawn due to the very small sample provided

F. Groups

Due to the increased participation of groups in QIS5 compared to QIS4, the results from QIS5 allow for drawing further conclusions to be drawn on the solvency of groups under Solvency II. For this purpose, QIS5 tested the differences between the three calculation methods for group solvency foreseen under Solvency II: the accounting consolidation-based method, the deduction and aggregation method and the combination of both methods. On average, as can be expected, when groups applied the deduction and aggregation method, rather than the accounting consolidation-based method, there was a significantly lower surplus. This is due to the non-recognition of diversification effects under the former method.

For groups using the accounting consolidation-based method based on the standard formula a reduction of around €86bn in group surplus compared to Solvency I can be observed, resulting in a weighted average of QIS5 surplus to Solvency I surplus of 57%. However, the surplus is only reduced by €3bn compared to Solvency I if a combination of local rules (assuming the use of deduction and aggregation method with local rules for third countries is allowed), and group (partial) internal models are used at their current status of development. This impact is particularly material for large groups.

For groups that submitted internal model results, there was an increase in surplus of about €6bn moving from Solvency I to QIS5, from €94bn to €100bn. However, it should be noted that there is a high variability in the results in this area due to the very small sample of groups that have submitted internal model results.

Similar to the results from QIS4, the group diversification effect is on average equal to a 20% reduction in group SCR compared to the sum of solo SCRs, naturally varying among groups depending on the diversity of activities and localisation of the businesses in the group.

Diversification is caused by two effects. Firstly, capital charges at solo level on intra-group transactions no longer apply at group level. Secondly “real” diversification occurs due to more diversified insurance activities of groups compared to solo undertakings. The impact of the intra-group transactions was eliminated from the total group diversification effect to assess the “real” diversification benefit; yet this impact may have been underestimated due to limited reporting on these transactions, which in turn leads to a potential overestimation of the “real” diversification benefit. The “real” (i.e. net from intra-group transactions) diversification benefits are mainly observable in the market and non-life catastrophe modules. Intra-group transactions mostly impact the capital charges for market (concentration risk and equity risk) and counterparty default risk, resulting in a reduction of these charges at consolidated group level compared to the solo charges.

As a default approach, no diversification between entities in the calculation of the risk margin was allowed. To assess the impact of this calculation, an approximation was applied, comparing the default approach with a potential diversification in the risk margin. Overall, the impact of diversification in the risk margin would be approximately 4% of the group SCR.

Groups have been asked to consider the availability constraints on own funds at the group level which prevent the “solo” item from being available to meet the group SCR. For those firms which identified such constraints, around 8% of their total group own funds would not be available for covering the group SCR, mainly due to restrictions related to the existence of restricted surplus funds or ring-fenced funds. In a few cases, restrictions were related to the location of entities in non-EEA countries. Contrary to the requirements of the exercise, many groups have included minority interests in the overall group own funds, hence considering them fully available.

G. Calculation Methods and Practicability issues

One of the aims of QIS5 was to encourage undertakings and supervisors to prepare for the introduction of Solvency II. By collecting comments on the practicability of the exercise, EIOPA was able to identify areas where further guidance would be required, or where the feasibility and complexity of the proposals should be improved in order to ensure a proper implementation.

QIS5 has shown areas where efforts for reducing the complexity would be welcomed by participants: the calculation of the counterparty default risk sub-module, the calculation of the loss absorbing capacity of technical provisions and deferred taxes, the adjustment for non-proportional reinsurance, the design of non-life and health CAT risk sub-modules, the calculation of expected profits in future premiums, the valuation of embedded options and guarantees in contracts, the look-through approach for structured credit, collective investment schemes or investment funds, the calculation of the lapse risk module, the application of the contract boundaries and the illiquidity premium.

To address these issues, EIOPA has identified areas for further work for simplifying some approaches or developing guidance - see hereunder.

Additional complexity arises from the difficulty experienced by participants in interpreting the new requirements at this stage of preparation, also in light of parallel developments, such as for example the accounting standards and the current uncertainty regarding the proposals for Solvency II implementing measures and Level 3 guidelines and standards.

At the same time, participants have identified areas where they need to make efforts in the implementation: raising the number and quality of their human resources, investing in training or improving their data quality and management. These efforts are still posing challenges and the vast majority of undertakings reported that they were not yet fully prepared for Solvency II implementation, but that they expected to be by end 2012.

Participants to QIS5 also mentioned other – non-quantitative – for, which will require further attention of the industry in preparing for Solvency II, such as governance, risk management and reporting requirements.

H. Key lessons and areas of further work

Following the earlier QIS4 exercise, QIS5 was designed both taking into account a number of lessons learned from the recent financial crisis, as well as building upon what worked well in QIS4 (for example the design of the MCR) and what was perceived as subject to improvement. Among the most relevant changes tested, the testing of an illiquidity premium, diversification benefits in the risk margin, the quantification of expected profits in future premiums (EPIFP) or the calculation of group capital surplus using different calculation methods can be mentioned.

Among the main lessons learned, EIOPA considers that a prudent framework has to be based upon sound capital and valuation requirements associated with particular attention to the quality of own funds (based on the Directive criteria for loss absorbency and permanent availability of such items). This is particularly relevant when it comes to one of the new tested areas, EPIFP. Any further consideration will need to take account of the definitional aspects identified during QIS5 as well as ensuring an outcome that is both economically sound and consistent with the principles of the Directive.

QIS5 has been conducted bearing in mind that it will be the last opportunity before the implementation of Solvency II, in January 2013, to undertake such a fully comprehensive exercise. This implies that further improvements to the system have to be done on the basis of *ad hoc* work and tests, rather than by designing a full new QIS exercise.

EIOPA has identified a number of areas where further work is needed, in order to improve the functioning of the system, both in terms of enhancing its practicability and ensuring the right calibration, in line with the Level 1 Directive.

The Solvency II project has been developed and tested for more than ten years, and QIS exercises are essential tools to ensure that the system is sound and workable. In particular, QIS5 aimed at testing the following areas:

Design and valuation of the system

The design of Solvency II has received broad support, and this is confirmed by the results and qualitative comments of QIS5. This is another core lesson from the crisis, namely that risk-based supervision provides the most appropriate framework for regulation and supervision. But both consistency and comparability need to be ensured; and to do so, more work is required in the field of valuation of technical provisions, including the feasible and economically sound application of an illiquidity premium, as well as on a consistent definition of contract boundaries, and the valuation of deferred taxes. Comparability, consistency and a level playing field are cornerstones of Solvency II. Anti-cyclical mechanisms within the framework, pillar 1 and pillar 2 dampeners," should help addressing the volatility inherent to Solvency II valuation rules.

Calibration and impact

QIS5 examined the calibrations in the system. Feedback from the industry and supervisors suggests that they are generally accepted as appropriate, although some concrete areas would benefit from further refinement. EIOPA is already working on some of these areas (e.g. CAT risk and non-life calibration).

Regarding the impact on the sector, the **overall reduction in terms of surplus does not endanger, based upon the data tested (end 2009), the sustainability of the sector.**

Feasibility and complexity

The huge participation rates and increase of participation of small and medium entities has provided EIOPA with the perfect benchmark to identify areas where the system can benefit from more simplicity (either through a less complicated design of the Standard Formula or via simplifications). EIOPA remains fully committed to advance towards a system that can be applied by all insurers, yet with sufficient granularity as to capture all quantitative risks appropriately. The areas to consider include the calculation of the counterparty default risk sub-module, the calculation of the loss absorbing capacity of technical provisions and deferred taxes, the design of the non-life and health catastrophe risk sub-modules, the look-through approach for structured credit, collective investment schemes or investment funds, the application of the contract boundaries and the illiquidity premium.

Preparedness

Again, the participation of (re)insurers provides a relatively positive message with regards to the approach that the sector is taking towards Solvency II. There is work to be done, particularly with regards to data and internal models, but also very positive signals been received and welcomed. At supervisory level, Solvency II is also a learning process: EIOPA and national supervisory authorities are building together the very much needed expertise. Yet, a lot of work has to be done in this area.

Transition

The intention of Solvency II is to bring risk-based supervision to the field of insurance, not to disrupt the functioning of undertakings, nor their viability. Transitional measures, per essence limited, are needed, particularly to ensure sound competition based on a level playing field and to allow for a smooth transition from Solvency I to Solvency II. But such measures should not be prolonged in time unduly. Transitional measures for equivalence with third countries, hybrid capital and subordinated liabilities, and discount rates on technical provisions make full sense in terms of the aforementioned objectives.

But we need not only to provide transitional measures, we also need to ensure the right amount of time and the appropriate scope. Too many transitional measures on too many topics as well as too much time will strongly disincentivise the shift towards Solvency II and risk-based supervision or have adverse effects on competition. Too little time will not help achieving the aforementioned objectives. The review of each transitional measure will have to indicate whether a transitional measure is still justified.

1. Introduction

1.1. Disclaimer

This report sets out the results from the fifth Quantitative Impact Study (QIS5) conducted by CEIOPS (EIOPA) on the basis of the European Commission's Call for Advice in the framework of the Solvency II project. This impact study was mainly designed to test the calibration and potential quantitative impact of the proposals (including a number of alternative approaches), as well as the preparedness of the industry and supervisors. As such, QIS5 is a field test and not a proposal for the final Solvency II framework.

Obviously, there remained scope for different interpretations, not least because Solvency II is a work in progress, and this impacted negatively on the comparability of the results. This may also explain some of the dispersion between country data, a phenomenon also found at country level between participants. Undertakings were also asked to provide results on a 'best efforts' basis on a relatively short timeline. As a result the quality of the data is such that detailed analysis has not always been possible, and all conclusions drawn from it should be seen in that light.

Whenever in this report a reference is made to a statement from a clear minority of national supervisors (e.g. a reference to 'one supervisor'), this is done because EIOPA feels it is important to retain as much information from the individual country reports as possible. When for any issue only the view of a minority of supervisors is given, this means that the other supervisors did not give an explicit view on this issue.

In many of the comments received by EIOPA it was not explicitly stated whether the opinions expressed were those of undertakings or their supervisors. References to the views of "countries" in this report would usually most reasonably be read as representing the views expressed by undertakings in that country, not necessarily supported by the supervisor unless that is explicitly stated.

Where reference is made in this report to conclusions relating to the European insurance sector, please note that this is only insofar as such conclusions can be drawn from the QIS5 participants. Since QIS5 had a very high participation rate it does not seem unreasonable to draw such conclusions.

1.2. Background

CEIOPS launched a first QIS (QIS1) in autumn 2005, the results of which were received in February 2006. The exercise focused on testing the level of prudence in technical provisions under several hypotheses. In the summer of 2006 CEIOPS conducted a more comprehensive second impact study (QIS2), which covered both technical provisions and the calculation of the solvency capital requirement (SCR) and minimum capital requirement (MCR). QIS2 focused on the methodology of the solvency requirements; the testing of the calibration of the parameters was left for the third study (QIS3). Building on the findings of the previous QIS exercises, QIS3 was launched in April 2007. The results of QIS3 were reported in November 2007 and laid the basis for QIS4, which covered all areas of the proposed regime, including the balance sheet impact, own funds, and the design and calibration of the standard formula. QIS4 also looked for the first time at the impact on groups and the

comparison between internal model and standard formula results. QIS4 results were published in November 2008.

1.3. Objectives

The results of QIS5 are intended to be of use in the European Commission's development of level 2 implementing measures. To try to ensure that the results provided a representative view, the target participation rates were significantly increased from previous QIS exercises. There was a particular emphasis on increasing participation among small and medium-sized (re)insurance undertakings.

QIS5 aimed to obtain detailed information on the quantitative impact of the proposals on insurers' and reinsurers' solvency balance sheets and also to check that the proposals were aligned with the principles and calibration targets set out in the Solvency II Framework Directive. It was also the intention to encourage undertakings and supervisors to prepare for the introduction of Solvency II and identify areas where further preparatory work may be required, and to provide a starting point for ongoing dialogue between supervisors and the industry as we move towards Solvency II implementation. Finally, it would also allow EIOPA to assess the feasibility and complexity of the proposals.

We also note that the results will make a useful contribution to ongoing work on the calibration of the non-life and non-SLT health underwriting risk modules.

There were a number of areas where two possible methods were tested with no default set:

- Discounting with or without transitional provisions;
- Internal Models and Standard Formula;
- Modular approach and single equivalent scenario for the adjustment for the loss absorbing capacity of technical provisions and deferred taxes;
- Consolidation and 'deduction and aggregation' methods for groups; and
- Local rules and Solvency II rules for groups' non-EEA entities.

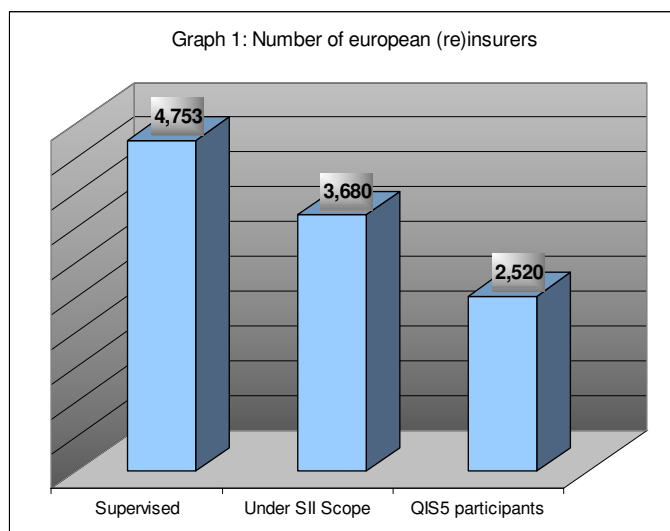
A final key feature of this QIS exercise was that all group results were submitted to national supervisors and then to a centralised CEIOPS (EIOPA) database, in order to allow aggregate analysis to be conducted. This approach was adopted in order to have sufficient sample size to have a good quality of analysis, and it applied to both the quantitative and qualitative submissions. Analysis was carried out in close co-operation with group supervisors, thus benefiting both from a consistent view across the European market, as well as from member state expertise.

1.4. Participation

77% of the 4753 European (re)insurers supervised by EIOPA members and observers at end 2009 will be affected by the Solvency II directive. A thousand existing small undertakings are expected not to fall into the scope of the directive.

68% of the affected (re)insurers participated on a voluntary basis in the fifth quantitative impact study.

167 groups, including major groups active on a worldwide basis as well as groups with business concentrated in a few or even a single EEA market, provided input allowing policy-makers to better understand the impact of the Solvency II proposals on a consolidated basis.



This report focuses on the quantitative and qualitative responses of the 2520 (re)insurers and 167 groups which provided usable information. The data received includes significant overlap in cases where quantitative information was received twice, once from the undertaking as an autonomous entity – referred to as solo in this report - and once as a member of a group. Group information was collected on a worldwide basis, including business conducted outside the EEA and non-insurance business whether regulated (banking activity) or not. In order to avoid repetition, group-specific findings are covered in a dedicated section while group findings not materially different from the solo findings are embedded in the relevant solo sections. In general, references to the EEA position will indicate the results for solo undertakings unless otherwise stated.

In its Call for Advice, the European Commission set out a target participation rate of 60% of solo undertakings and 75% of groups. Thanks to close cooperation with European trade associations and long-time stakeholders and the efforts of national supervisors, support for the Solvency II project has crystallised in the participation of an impressive number of (re)insurance undertakings and groups. The participation target has largely been met and all 30 EEA countries are represented in this study.

The overall increase in participation compared to the previous quantitative impact study is of more than one thousand undertakings, or an increase of 78%.

Table 1: Participation in QIS5¹

	Total number	Number SII affected	QIS5 participants	Of which		
				small	medium	large
Life	888	799	610	291	236	82
Non-life	2,681	1,879	1,284	834	378	72
Reinsurers	203	182	111	72	26	13
Captive	393	353	175	171	4	0
Composite	588	467	336	142	146	48
All	4,753	3,680	2,520	1,511	791	217
of which Health	1,288	749	382	270	94	18
of which Mutuels	1,509	800	454	337	96	21

Table 3: Participation in QIS5 compared to QIS4

	QIS5/QIS4	Of which		
		small	medium	large
Life	174%	229%	170%	98%
Non-life	187%	253%	139%	87%
Reinsurers	227%	300%	173%	130%
Captive	177%	174%	400%	
Composite	149%	161%	154%	112%
All	178%	227%	152%	99%
of which Mutuels	149%	190%	93%	88%

Table 4: Groups participation by type of group

	EEA groups without non-EEA entities	EEA groups with non-EEA entities	EEA subgroup(s) of non-EEA groups	Total respondents
Sample size	121	41	5	167

The table below shows the number of group participants by size: large groups were defined as groups with total assets greater than €90bn, small groups as those with total assets less than €30bn.

It is important to note the high participation rate among small groups, which explains most of the improvement in the participation rate between QIS4 and QIS5.

Table 5: Groups participation by size

	Total	Large	Medium	Small
Sample size	167	17	23	127

¹ As in QIS4, classification of solo undertakings by size was done according to the following table.

Table 2: Limits for size classification

Size	Non-life insurers	Life insurers
Large	> €1bn gross written premiums	> €10bn gross technical provisions
Medium	€0.1bn - €1bn gross written premiums	€1bn - €10bn gross technical provisions
Small	< €0.1bn gross written premiums	< €1bn gross technical provisions

For reinsurers and composite direct insurers which write both non-life business and life business, the size class was assigned on a discretionary basis in line with the set classification of non-life insurers and life insurers described above. For instance:

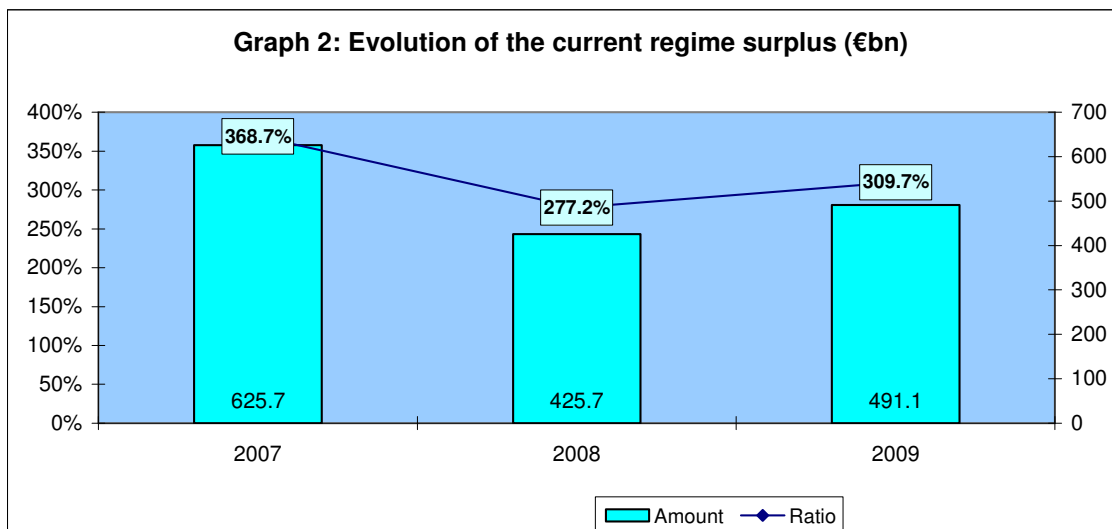
- a composite insurer which conducts medium non-life business and small life business was classified at least medium;
- a composite insurer which conducts medium non-life business and medium life business was classified medium or large.

Health insurers (defined for QIS5 as undertakings with more than 80% of their technical provisions relating to health business) were given size classifications according to their legal designation as a life, non-life or composite undertaking.

2. Overall financial impact

2.1. Overall surplus

Since the previous QIS, which was run on end 2007 accounts, the insurance sector financial surplus under the current solvency regime has seen a marked decrease in 2008 (of the order of €200bn) - followed by a partial recovery in 2009. This evolution is largely explained by the impact the financial crisis had on the value of assets owned by the sector, and on interest rates used to discount liabilities in some countries. At the end of 2009 the surplus was approximately €500bn.



The Solvency II framework replaces the existing solvency requirement with a set of two financial requirements: a threshold triggering immediate and ultimate supervisory action named the Minimum Capital Requirement (MCR) and a higher, risk-sensitive capital requirement named the Solvency Capital Requirement (SCR).

Subject to supervisory approval, the standard approach to computing the SCR can be substituted, wholly or in part, by an undertaking's own internal modelling of the own funds needed to support the risks borne, incentivising sound risk management and rewarding it.

The current regime's requirements are based on applying a common set of rules to existing accounting figures which are prepared differently in different countries, resulting in non-harmonised outcomes. In sharp contrast with this, the new regime applies a principles-based harmonised framework from the ground up:

- The starting point of the solvency assessment is a harmonised prudential balance sheet valued according to Article 75 of the Solvency II directive². This harmonised balance sheet is not necessarily the same as the one in an undertaking's audited accounts.
- The Solvency Capital Requirement is defined as the potential amount of own funds that would be consumed by unexpected large events whose probability of occurrence within a one year time frame is 0.5%. This definition based on a

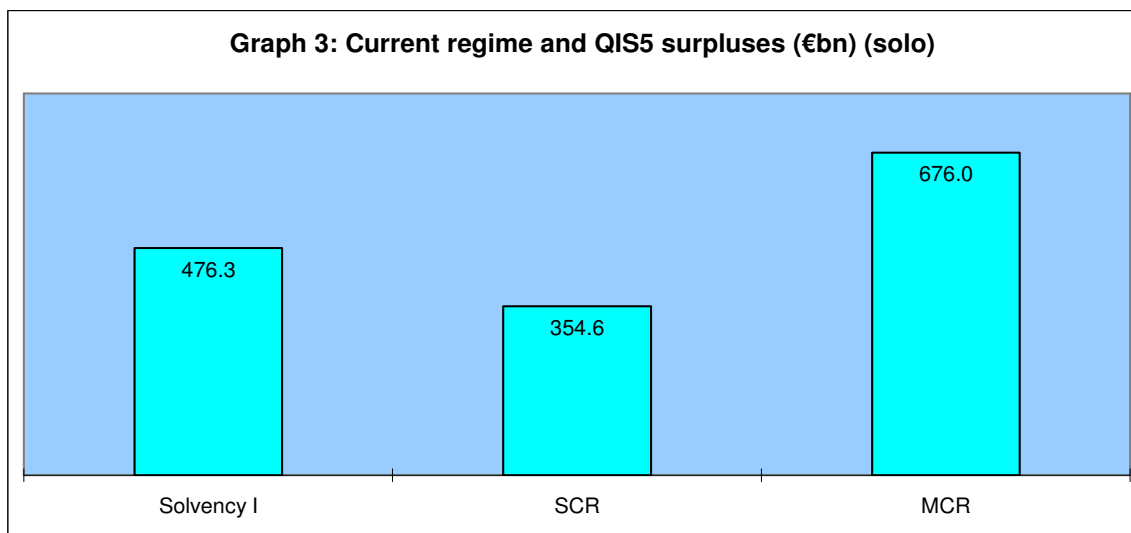
² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:0001:0155:EN:PDF>

probability measure allows (and sometimes mandates) the replacement of all or part of the standard formula with an internal model, when this can be shown to be better able to fulfil the directive requirements in relation to an undertaking's particular risk profile.

- The Minimum Capital Requirement is defined as the potential amount of own funds that would be consumed by unexpected events whose probability of occurrence within a one year time frame is 15%. In order to ensure the smooth functioning of graduated supervisory intervention (often referred to as "the ladder of intervention"), the linear result produced by the MCR calculation is bounded between 25% and 45% of the SCR, subject to an absolute minimum.
- The SCR applies at both solo and group level, whereas the MCR only applies at solo entity level.

In introducing these two levels of capital requirements on top of a fully harmonised solvency balance sheet, the new regime makes it possible to simultaneously incentivise sound risk management by putting the onus on the risk-based SCR and allow through the lower MCR a graduated supervisory response to any worsening in an undertaking's financial position.

The following graph shows the overall quantitative effect of the switch from the current requirements³ to the two Solvency II capital thresholds as specified under QIS5.



The financial position of the European insurance sector remains comfortable assessed against the standard formula SCR⁴ calculated according to the QIS5 specifications, with the eligible amount of own funds to cover the SCR/MCR exceeding the regulatory requirements by around €360bn. This surplus has decreased by c. €120bn compared

³ Please note that in most instances where reference is made to the surplus under Solvency I, this is taken from the statistical annex of the FSC annual reports: as such it represents the surplus for all insurers in the relevant countries rather than only QIS5 participants. Therefore while they are useful for observing the overall trends, the figures are not directly comparable. Since QIS5 participants covered 95% of EEA technical provisions this should not make a material difference. For the graph which follows, however, this number has been adjusted relative to the QIS5 data and participants.

⁴ Please note that throughout section 2, reference to the SCR relates to the standard formula SCR unless stated otherwise.

to the current regime. At the same time, the margin before the MCR, the point of mandatory supervisory intervention, has increased by €200bn.

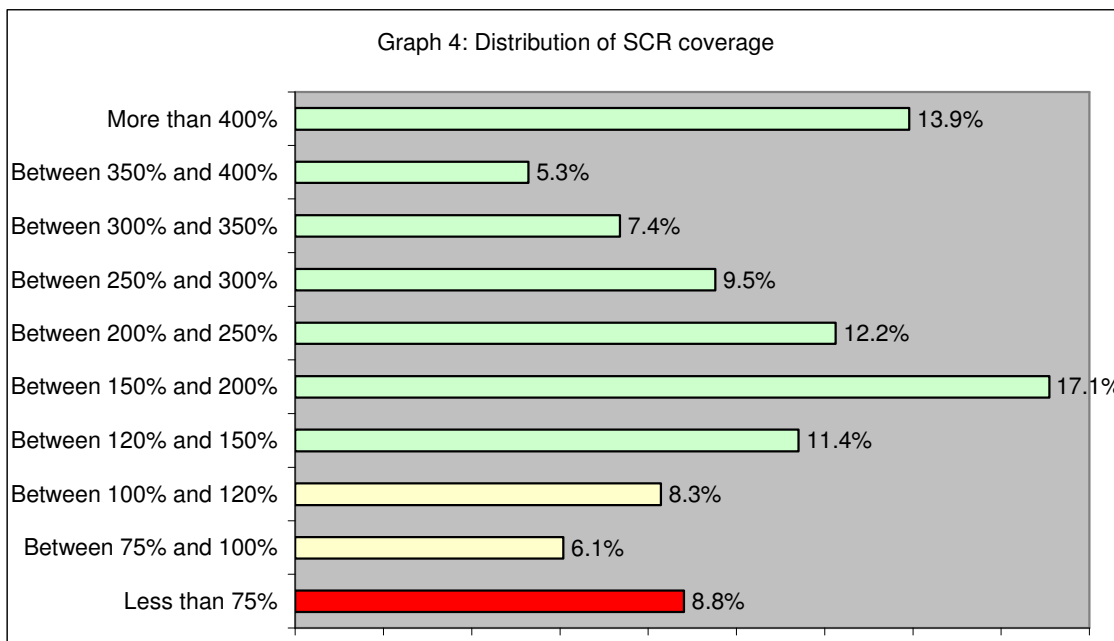
As anticipated, the Solvency II regime (as tested under QIS5) has created the desired range for a ladder of supervisory intervention. At market level, the surplus over MCR is almost twice the surplus over SCR.

The change in solvency ratios is much greater, but less representative of the overall impact, as both components of the ratio (capital requirements and eligible solvency elements) are based on fairly different principles in the two regimes.

Table 6: Capital requirements and surplus

	Current regime	Solvency II	
		SCR	MCR
Solvency ratio	310%	165%	466%
Surplus	476	355	676
Requirements	Require	227	185
Own funds	Eligible	703	861

Moving from the current valuation framework to the harmonised Solvency II one triggers some revaluation effects on the asset and liability sides of the balance sheet which impact the own funds available to meet the regulatory requirements. Moreover, some off-balance-sheet items may also be counted as available ancillary own funds. According to their quality, the available own funds components are eligible to meet either the MCR, the SCR or both. This explains why eligible own funds have increased compared to the current regime, but by differing amounts depending on the regulatory threshold concerned.



At individual level, 29% of the participating undertakings had SCR coverage between 120% and 200%, around the market average of 165%, while almost half of all participating undertakings held more than twice their capital requirements.

15% of undertakings displayed a solvency ratio of less than 100%, with a significant number of them only just under the threshold. Conversely some were just above the 100% level.

Since it is a risk-based measure and a significant portion of the risks are linked to the fast-changing nature of the financial markets, the SCR will be a measure whose precise value will change much more frequently than the annual rhythm of observation envisaged. This volatility is acknowledged in a regime which allows for supervisory judgement to be applied at the first trigger point without immediate action being compulsory for all cases.

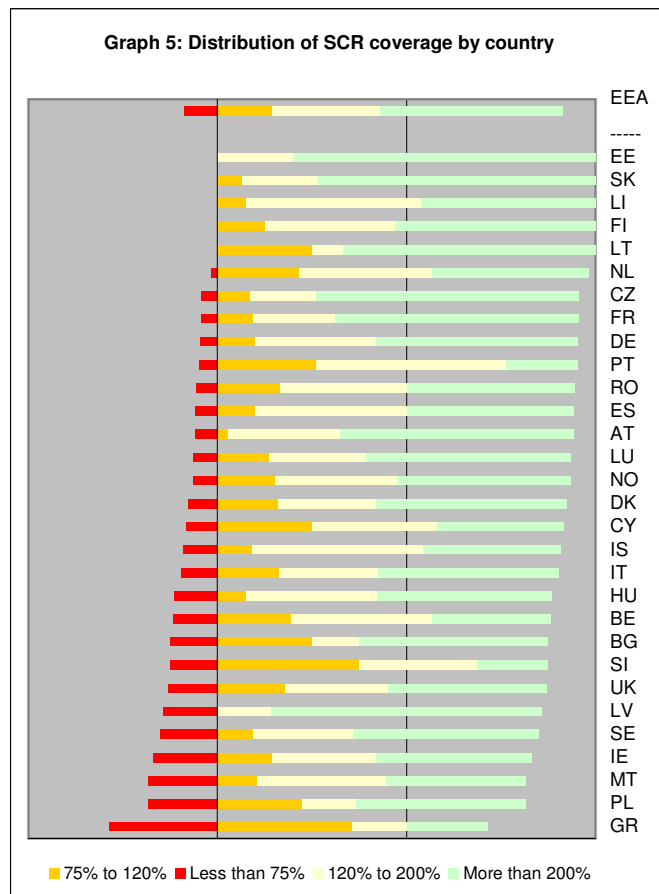
At end 2009, 8.8% of the participating undertakings had a solvency ratio that was sufficiently far below the 100% level to discard the possibility of a measurement error or the effects of the inherent short-term volatility of the financial markets being the cause.

A quarter of these undertakings were group members: in their cases this result indicates a mismatch in risk and capital allocation within the group, which could be fairly easily addressed either through capital reallocation or intra-group risk transfer.

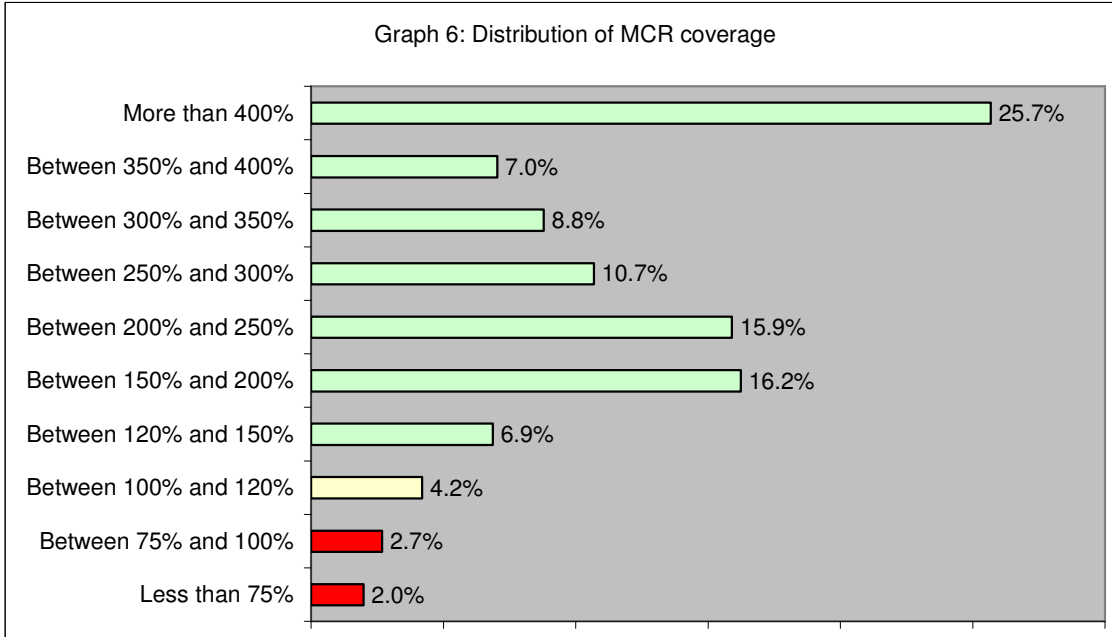
In a few cases, the revaluation of the balance sheet using Solvency II principles resulted in negative own funds.

At country level, the percentage of participants with SCR solvency ratios above 200% varied between 19% and 80%. In one country, no participant had a solvency ratio below 120%. In four other countries, no undertaking had a solvency ratio below 75%.

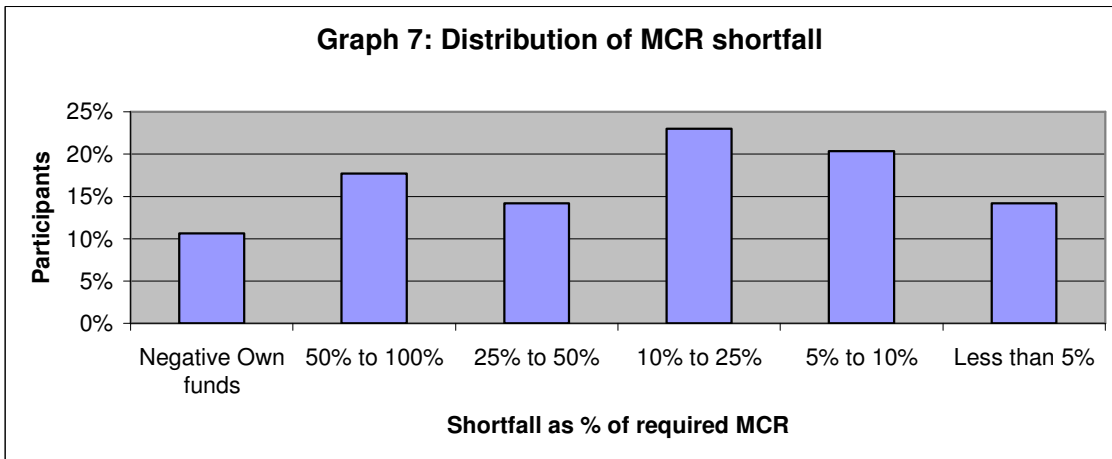
In the majority of countries, around 10% of undertakings had a solvency position materially lower than the SCR. This group in particular includes a number of small undertakings, which is unsurprising given the high proportion of them among QIS5 participants.



The distribution of coverage ratios for the MCR displayed a similar pattern to the findings for the SCR, albeit with the distribution noticeably shifted upward. While 65% of undertakings can cover more than twice their MCR, 9.4% display a coverage ratio under 120%.



4.6% of participants across Europe were unable to meet the MCR requirement. The scale of the shortfall among those undertakings is as follows:



So around a third (17.7% of all participants) have a shortfall of less than 10%; however, a quarter (22.7% of all participants) have a shortfall greater than 50% of the MCR. Overall, 1.3% of all participating undertakings had negative own funds according to the QIS5 valuation principles.

2.2. Breakdown of the surplus by country

The breakdown of the overall EEA surplus by country is not homogeneous. In thirteen countries, the surplus assessed against the SCR is greater than the surplus under the current regime.

Table 7: Surplus by country

Surplus	Current	SCR	MCR
QIS5	476	355	676
<i>QIS5 adjusted</i>	<i>451</i>	<i>395</i>	<i>676</i>
AT	3.5	6.4	10.7
BE	11.0	11.2	17.9
BG	0.2	0.0	0.4
CY	0.4	0.4	0.6
CZ	2.0	2.3	3.5
DE	95.2	118.2	182.7
DK	15.2	11.4	18.8
EE	0.2	0.3	0.4
ES	19.1	11.9	22.0
FI	4.7	3.6	7.9
FR	105.8	81.5	135.4
GR	0.4	0.7	1.6
HU	0.5	1.1	1.8
IE	13.5	4.8	18.4
IS	0.2	0.1	0.2
IT	25.6	38.4	52.7
LI	0.4	0.2	0.4
LT	0.1	0.1	0.2
LU	4.1	4.3	7.7
LV	0.0	0.1	0.1
MT	0.5	0.4	0.8
NL	25.0	17.3	34.0
NO	7.0	3.2	9.0
PL	4.4	7.4	10.8
PT	2.1	1.2	3.0
RO	0.5	0.3	0.6
SE	71.8	32.4	60.8
<i>SE adjusted⁵</i>	<i>46.8</i>	<i>32.4</i>	<i>60.8</i>
SI	0.2	0.2	0.8
SK	0.8	1.3	1.7
UK	61.8	-5.5	71.1
<i>UK adjusted⁶</i>	<i>61.8</i>	<i>34.5</i>	<i>71.1</i>

⁵ Please note there are two figures for the SE SCR surplus. The second figure is adjusted to compare the QIS5 model against the Traffic-Light model currently used in this country.

⁶ Please note there are two figures for the UK SCR surplus. The second figure is adjusted to remove the effect of certain risk charges on a small number of current intra-group arrangements which are unlikely to remain in place under Solvency II. This provides a more accurate presentation of the likely UK surplus position under the new regime.

For two countries, the surplus figures are presented twice, the adjusted figure aiming to provide a more accurate presentation of the tested proposal impact. Based on the raw data, the surplus decrease is around 25%, whereas on adjusted figures, the surplus reduction is around 10-15%.

The above data should be interpreted carefully, especially when undertaking comparisons between countries. The aggregated raw surplus per country is dependent on the rate of QIS5 participation and the structure of participants, which varied between countries. In individual markets, the overall surplus may be heavily influenced by a few large undertakings, and thus may not be indicative for the average insurance undertaking.

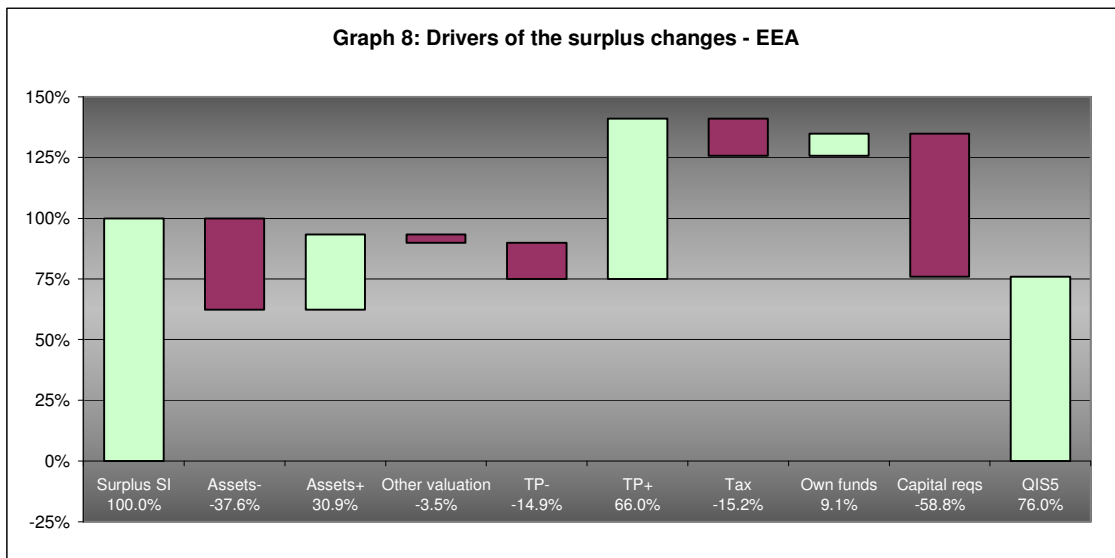
Only two countries showed a decrease of the overall surplus between Solvency I and the MCR.

2.3. The main drivers of the surplus changes

Three main drivers explain the changes in the surplus from the current regime to the Solvency II framework:

- the shift from the current balance sheet to the harmonised Solvency II balance sheet;
- the shift from the current requirements to the harmonised Solvency II capital requirements; and
- the differences in the own funds elements allowed to cover the requirements.

The following graph shows the respective influence of these items, splitting the valuation impacts into positive and negative effects. As this revaluation changes the amount of own funds compared to the current situation, it also creates deferred tax assets or liabilities.

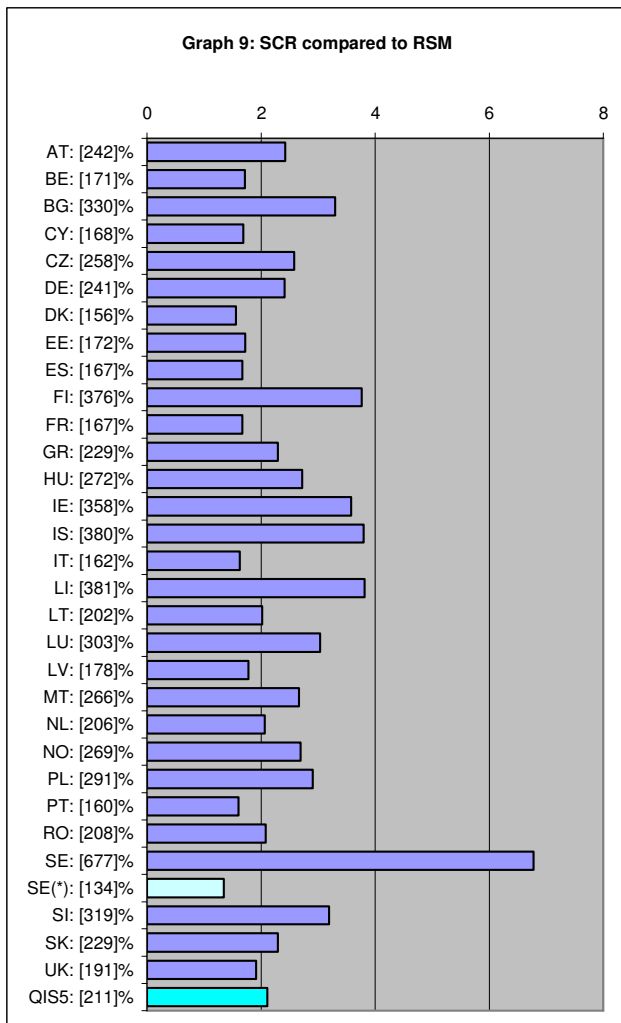


As can be seen from this graph, the relatively moderate overall impact - a decrease in the range of 20% of the overall surplus - is the result of individual movements in the main components of much greater magnitude.

Among these, it can be noted that at end 2009 the upward and downward revaluations of assets to conform to the harmonised valuation principles almost offset one another. On the liability side, the removal of the prudence in existing technical provisions had a far greater impact (66%) than the revaluation upward of some best estimates (-15%). The net effect of the revaluation of the balance sheet did not solely result in an increase in the eligible own funds available to cover the solvency requirements; a portion of it was instead classified as deferred tax liabilities, which increased substantially.

The increase in capital requirements going from the Required Solvency Margin (RSM) to the SCR amounted to 59% of the Solvency I surplus, or 43% when adjusted as described previously. This amounted to a doubling of capital requirements at EEA level, and was of the same order as the change in valuation of technical provisions.

At individual country or undertaking level, the overall effect of the tested changes varied materially, depending on both their risk profile and the impact of applying the common valuation principles to their balance sheet. As an illustration, the following table shows the relative size of the SCR and the existing RSM by country⁷.



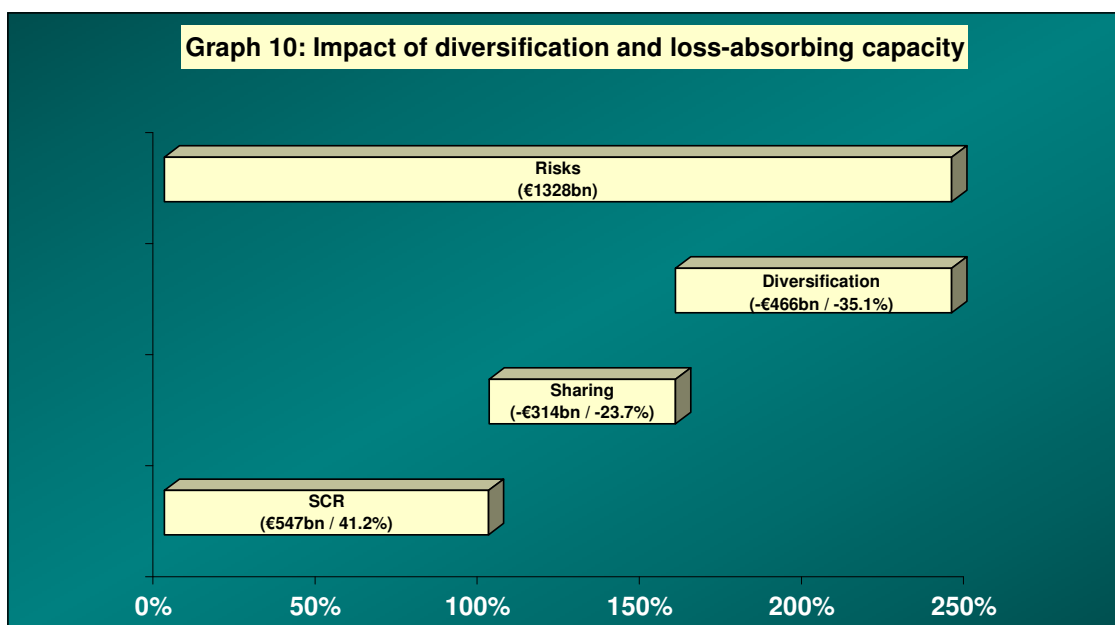
⁷ For Sweden, the evolution is presented against both the Required Solvency Margin, and the Traffic-Light Model (*).

2.4. Impact of diversification

To calculate the Solvency II capital requirement, which is defined at the overall SCR level, the standard formula applies a modular bottom-up approach in which each of the underlying risk drivers is modelled using the same calibration as that set by the directive for the overall result. For QIS5, the sum of the individual risks modelled totalled more than €1300bn.

To acknowledge the fact that the individual risks are not all expected to materialise at the same time (e.g. a shock on financial markets and a loss on underwriting risks would not necessarily crystallise at the same time), the standard formula recognises the benefits of risk diversification through the use of linear correlation techniques. For QIS5, these diversification benefits amounted to a €466bn reduction in the total risk charge at solo level.

The last stage in the derivation of the SCR recognises that if risks were to materialise, part of their cost might be transferred onto policyholders (e.g. through a reduction in the bonuses attributed to policies with profit participation), and part of the remaining cost might result in a reduction in the future taxes expected to be paid to tax authorities. For QIS5, the expected sharing of the cost of risk crystallisation with policyholders and tax authorities resulted in a €314bn reduction in the own funds needed.



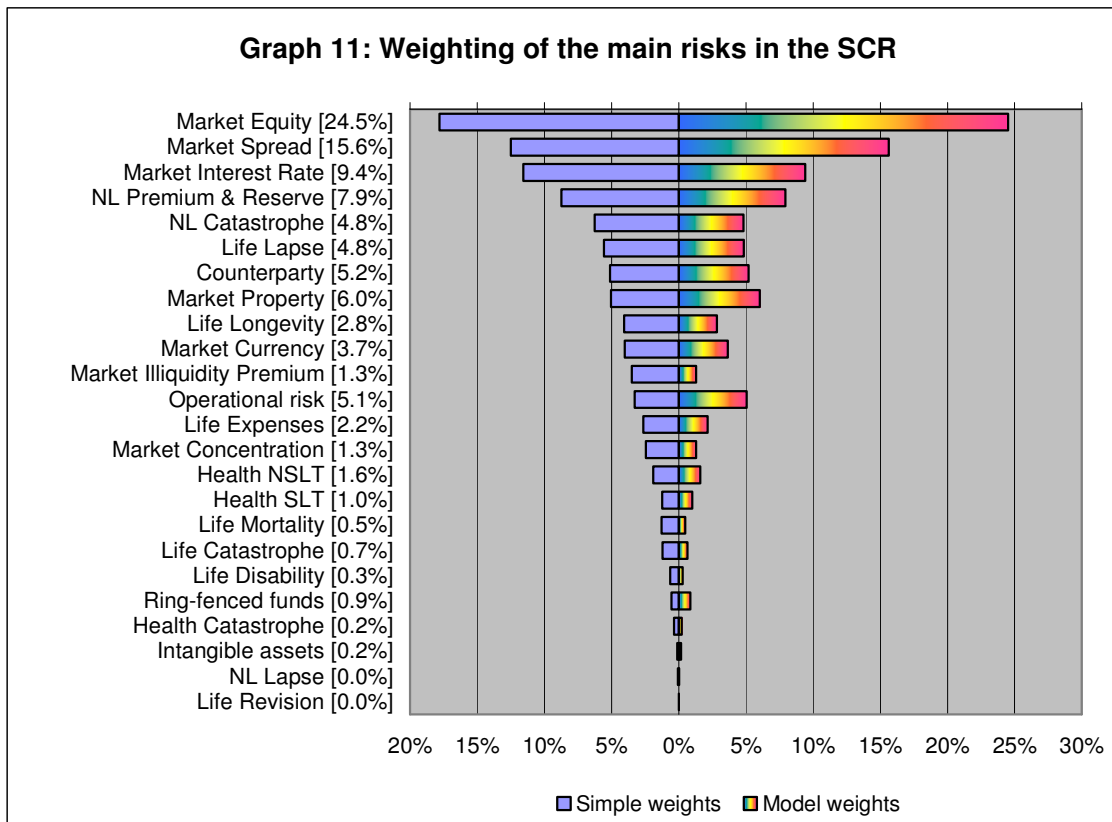
Overall, the final SCR of €547bn is a little above 41% of the sum of individual risks modelled. Using this overall risk reduction as a basis for calculating the reduction in individual risks gives a rough idea of the average real risk charges. Using this simple approach would for example show that while the initial risk loading for listed equity in QIS5 was 30% of the equity exposure, the final risk capital required was on average equivalent to a 12.4% capital charge.

This simple approach overlooks the fact that the diversification benefits are not evenly distributed between risks, but are dispersed between the modules and sub-modules of the standard formula through a set of correlation matrices that aim to closely match

observed correlations between the individual risks and sub-risks (e.g. the correlation between interest rates and equities is not expected to be the same as the correlation between life expectancy and fire and other damage to property).

In QIS5 a mathematical technique was tested to allocate back the diversification benefits to underlying risks taking into account the different levels of correlation assumed (the Single Equivalent Scenario approach); this makes it possible to more precisely derive the relative weights of the different risks in the final result.

The following graph compares the simple and Single-Equivalent-Scenario-based approaches to show the SCR's sensitivity to the main risks modelled, giving in brackets the values of the model weights.



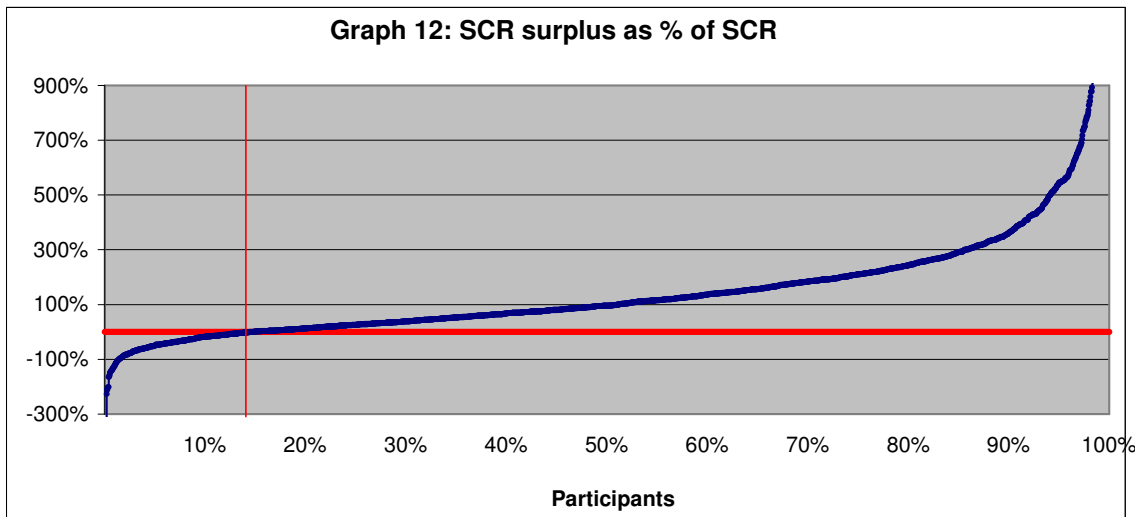
Under both approaches, the main risk drivers can be seen to be the principle market sub-risks (equity, spread and interest rates) followed by the principle non-life underwriting sub-risks (premium and reserve risk and catastrophe risk).

At the sector level some risks appear marginal (intangible assets, non-life lapse or life revision risks). However they can be more significant for some individual undertakings.

2.5. SCR coverage

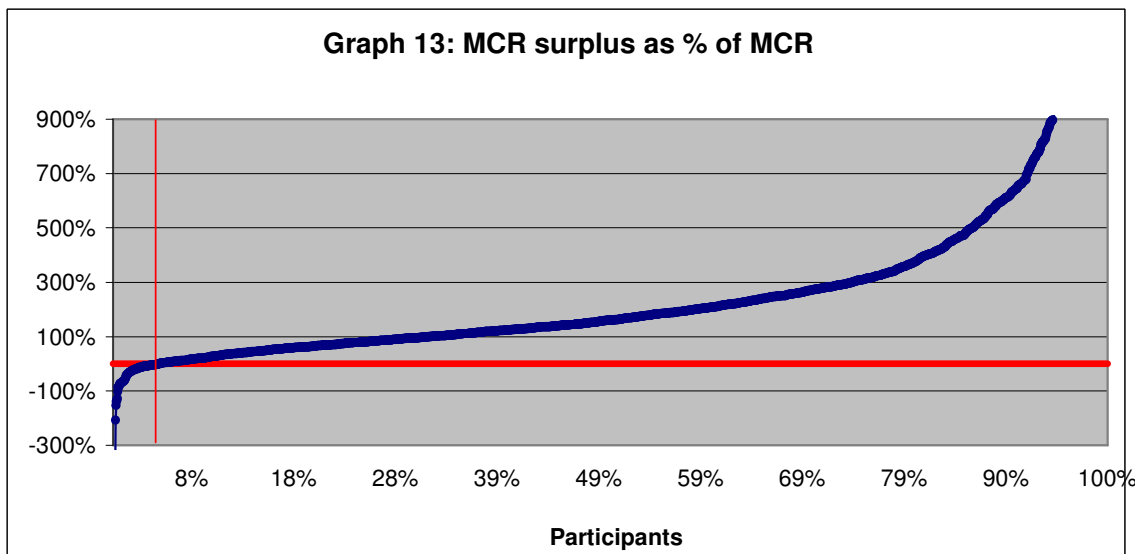
The below graph considers the surplus of eligible own funds over the SCR for all undertakings in Europe. The horizontal red line divides undertakings into those which have eligible own funds exceeding their SCR (above), and those which do not have enough eligible own funds to meet their SCR (below). A surplus of less than -100%

shows undertakings which have negative own funds. We can see that approximately 85% of undertakings meet their SCR, and a tiny proportion of undertakings fail to cover their QIS5 liabilities with assets. Around half of the undertakings have enough eligible own funds to cover their SCR at least twice over.



2.6. MCR coverage

The surplus over final MCR (taking into account the corridor and AMCR, see chapter 7 for further details) was as follows:



As stated previously, 4.6% of participants across Europe do not meet the MCR requirements.

2.7. Group surplus

As summarised in the table below, an €86bn decrease in group surplus eligible own funds compared to Solvency I can be observed if the accounting consolidation-based method with the standard formula is used by all the groups in the sample. If group internal models were approved at their current stage of development and either equivalence were granted or transitional measures were put in place allowing the use of local rules for third countries under deduction and aggregation, the overall surplus would only be reduced by €3bn. Both internal models and the treatment of third countries had impacts which were individually material and of a similar magnitude. The table below also shows the split of their impact by size of group.

Table 8: Ratio of surplus under QIS5 to surplus under Solvency I when using internal models and local rules for third countries

(€bn)	Surplus Solvency I	Surplus QIS5	Sample size
Results if internal models were approved and/or local rules under D&A were used for third countries			
Large	109.4	129.5	17
Medium	26.7	18.3	21
Small	64.3	49.5	109
All	200.4	197.4	147
Accounting consolidation-based method with standard formula			
Large	109.4	54.6	17
Medium	26.7	15.5	21
Small	64.2	43.6	108
All	200.3	113.7	146

Further analysis of the group results can be found in chapter 9.

3. Valuation of assets and liabilities other than technical provisions

Outlined below is the composition of the balance sheet, for both solo undertakings and groups, and under the valuation principles of QIS5 and the current accounting regime⁸.

As touched on in section 2.4, for solo undertakings changes in the valuation of assets between the two regimes have only a limited impact, whereas there is a more significant drop in liabilities, largely driven by a decrease in technical provisions. Basic own funds increase (both in absolute terms and as a proportion of the balance sheet) and are joined by ancillary own funds, which are not included under the current regime. Groups see a greater drop in the value of assets, and a smaller, but still significant, fall in the value of liabilities; however they too have a material increase in own funds.

It can also be observed that the principle asset categories are unit-linked assets, corporate bonds, sovereign debt and equities. It should also be noted that some investment funds were reallocated to other asset categories according to the look-through approach. Overall groups hold proportionally more unit-linked assets and corporate bonds than solo undertakings, and fewer equities and reinsurance assets.

The more significant changes in asset structure between the two regimes include the increased proportion made up by unit-linked assets and sovereign bonds under QIS5, the drop in investment funds, and a decrease in other assets. Note that goodwill forms part of the current asset structure, but does not appear under QIS5, something which has a greater impact for groups. Groups also saw a much greater increase in the proportion made up by corporate bonds than solo undertakings.

The liabilities side of the balance sheet is unsurprisingly dominated by technical provisions, in particular for life and unit-linked business. We can observe the introduction of the risk margin under QIS5, discussed in greater detail in section 4.3, and can also see an increase in the value of deferred tax liabilities (more significant than the corresponding increase in deferred tax assets) which results from differences between the QIS5 balance sheet and the one used under the tax regime.

See section 4.1 for analysis of the changes in the valuation of technical provisions, and section 8 for discussion of the structure of own funds.

⁸ It should be noted that the valuation bases of current balance sheets may vary significantly between countries.

Graph 14: The current balance sheet (solo)

Total assets	+	7,456.60	<i>(structure in % of total assets)</i>
			19.10% <i>Unit linked</i>
			22.50% <i>Corp bonds</i>
			19.00% <i>Sovereign</i>
			10.30% <i>Equity</i>
			4.10% <i>Mortgage</i>
			2.10% <i>Property</i>
			3.60% <i>Cash</i>
			6.60% <i>Reinsurance</i>
			6.00% <i>Investment funds</i>
			0.20% <i>Deferred tax assets</i>
			0.10% <i>Goodwill</i>
			6.40% <i>Other</i>
Total liabilities	-	-6,713.90	
			-9.10% <i>Non-Life TP</i>
			-4.30% <i>Health TP</i>
			-47.90% <i>Life TP</i>
			-21.20% <i>Unit-linked TP</i>
			0.00% <i>Risk margin</i>
			-3.30% <i>Short term liabilities</i>
			-0.20% <i>Deferred tax liabilities</i>
			-4.00% <i>Others</i>
Basic own funds		742.7	10.00%
			2.10% <i>Shares and equivalent</i>
			1.70% <i>Share premium account</i>
			3.10% <i>Retained earnings</i>
			1.70% <i>Other reserves</i>
			0.60% <i>Subordinated liabilities</i>
			0.80% <i>Others</i>

Updated 21/03/2011

Graph 15: The QIS5 balance sheet (solo)

Total assets	+	7,432.4	<i>(structure in % of total assets)</i>
			20.0% <i>Unit linked</i>
			22.7% <i>Corp bonds</i>
			20.4% <i>Sovereign</i>
			10.8% <i>Equity</i>
			4.0% <i>Mortgage</i>
			2.8% <i>Property</i>
			3.8% <i>Cash</i>
			5.9% <i>Reinsurance</i>
			3.7% <i>Investment funds</i>
			0.3% <i>Deferred tax assets</i>
			5.7% <i>Other</i>
Total liabilities	-	-6,491.2	
			-6.7% <i>Non-Life TP</i>
			-4.0% <i>Health TP</i>
			-45.9% <i>Life TP</i>
			-20.7% <i>Unit-linked TP</i>
			-1.9% <i>Risk margin</i>
			-3.0% <i>Short term liabilities</i>
			-1.3% <i>Deferred tax liabilities</i>
			-3.8% <i>Others</i>
Basic own funds		941.1	12.7%
			1.9% <i>Shares and equivalent</i>
			1.7% <i>Share premium account</i>
			3.2% <i>Retained earnings</i>
			-0.4% <i>Asset adjustments</i>
			2.1% <i>Liabilities adjustment</i>
			1.1% <i>EPIFP</i>
			1.5% <i>Other reserves</i>
			0.7% <i>Subordinated liabilities</i>
			0.8% <i>Others</i>
Ancillary own funds	+	11.9	0.2%

Graph 14: The current balance sheet (groups)

Total assets	+	6,543.10	<i>(structure in % of total assets)</i>
			21.70% <i>Unit linked</i>
			24.70% <i>Corp bonds</i>
			19.80% <i>Sovereign</i>
			6.00% <i>Equity</i>
			5.80% <i>Mortgage</i>
			2.70% <i>Property</i>
			2.60% <i>Cash</i>
			2.40% <i>Reinsurance</i>
			3.30% <i>Investment funds</i>
			0.40% <i>Deferred tax assets</i>
			1.00% <i>Goodwill</i>
			9.70% <i>Other</i>
Total liabilities	-	-6,166.30	
			-7.90% <i>Non-Life TP</i>
			-2.90% <i>Health TP</i>
			-49.90% <i>Life TP</i>
			-21.70% <i>Unit-linked TP</i>
			0.00% <i>Risk margin</i>
			-2.90% <i>Short term liabilities</i>
			-0.70% <i>Deferred tax liabilities</i>
			-8.20% <i>Others</i>
Basic own funds		376.7	5.80%
			0.90% <i>Shares and equivalent</i>
			1.50% <i>Share premium account</i>
			1.40% <i>Retained earnings</i>
			0.80% <i>Other reserves</i>
			0.60% <i>Subordinated liabilities</i>
			0.50% <i>Others</i>

Updated 21/03/2011

Graph 15: The QIS5 balance sheet (groups)

Total assets	+	6,454.9	<i>(structure in % of total assets)</i>
			22.1% <i>Unit linked</i>
			26.4% <i>Corp bonds</i>
			20.6% <i>Sovereign</i>
			6.5% <i>Equity</i>
			5.7% <i>Mortgage</i>
			3.3% <i>Property</i>
			3.1% <i>Cash</i>
			2.3% <i>Reinsurance</i>
			3.4% <i>Investment funds</i>
			0.4% <i>Deferred tax assets</i>
			6.2% <i>Other</i>
Total liabilities	-	-5,935.7	
			-5.9% <i>Non-Life TP</i>
			-3.2% <i>Health TP</i>
			-48.8% <i>Life TP</i>
			-22.1% <i>Unit-linked TP</i>
			-1.5% <i>Risk margin</i>
			-2.3% <i>Short term liabilities</i>
			-1.2% <i>Deferred tax liabilities</i>
			-6.9% <i>Others</i>
Basic own funds		519.1	8.0%
			1.1% <i>Shares and equivalent</i>
			1.8% <i>Share premium account</i>
			1.4% <i>Retained earnings</i>
			-1.0% <i>Asset adjustments</i>
			0.6% <i>Liabilities adjustment</i>
			1.0% <i>EPIFP</i>
			1.1% <i>Other reserves</i>
			1.3% <i>Subordinated liabilities</i>
			0.8% <i>Others</i>
Ancillary own funds	+	3.1	0.0%

3.1. General

In general the QIS5 economic valuation requirements for assets and other liabilities were supported and did not cause many problems. Because of the similarity with EU-endorsed international accounting standards (IFRS) many undertakings have experience with most of the valuation requirements. This is especially the case for undertakings that use IFRS or undertakings that use local GAAP in countries where the local accounting principles are similar to IFRS valuation principles. Countries where local accounting principles differ significantly from IFRS and where assets are valued on a cost basis reported more problems and some doubts about the reliability of the reported QIS5 balance sheet.

Undertakings reported several cases where a mark to market valuation was not possible, because markets were nonexistent or illiquid. When mark to market valuation was not possible, a mark to model approach was adopted, or local GAAP figures or valuation on a cost basis were used. Undertakings did not give much information on the mark to model techniques used. In cases where local GAAP or cost-based figures were used, undertakings often mentioned the materiality principle. Several respondents asked for more guidance on materiality.

Notwithstanding the general support for the QIS5 valuation principles, undertakings and supervisors mentioned some balance sheet items where difficulties were experienced. In most cases it concerned those items where QIS5 requirements differed from IFRS requirements. The QIS5 restriction on the use of cost-based approaches also caused difficulties in cases where this is permitted in the financial statements – for example in the valuation of property.

The valuation of deferred taxes was found to be a very difficult issue. Undertakings had different ways of dealing with the valuation and with the assessment of whether the realisation of deferred tax assets would be probable within a reasonable time frame.

Other items that were often mentioned as being difficult were: intangibles, participations (where no market value was available), contingent liabilities, financial liabilities and employee benefits.

Particularly because of the differences between statutory accounting and Solvency II rules, one supervisor advocated an external audit for the Solvency II balance sheet.

3.2. Impact

Investments form the largest component on the asset side of the balance sheet and technical provisions the largest component on the liability side.

On an aggregate level, misstatement in the valuation of most of the assets cited as areas of difficulty above (intangibles, contingent liabilities, financial liabilities and employee benefits) does not significantly affect the data quality of the total balance sheet, although there may be an impact if compared with own funds or the SCR. However this may not be the case for participations and deferred taxes (in part because of the latter's relationship with the SCR as part of the adjustment for loss absorbing capacity).

3.3. Materiality

Most undertakings considered the accumulated effect of the materiality principle not to be significant. Many undertakings used materiality concepts to a rather limited extent.

Some undertakings used the same materiality decisions as in the IFRS balance sheet. A few undertakings mentioned explicit benchmarks (for example, a percentage of the balance sheet, own funds or the SCR).

In the case of immaterial items where market values were not available or mark to model was difficult to apply, assets and other liabilities were valued in line with current accounting principles or on a historical cost basis.

Particularly where items with a short duration were considered, undertakings argued that valuation on a historical cost basis did not differ significantly from fair value valuation, e.g. for loans and financial liabilities.

3.4. Mark to model

Several undertakings reported using mark to model for investment assets where reliable market prices were not available. Investment property, property, plant and equipment, unlisted bonds and equity, structured credit, preference shares, private equity, investment funds, mortgages, reinsurance recoverables, private loans, certain derivatives and term deposits were all mentioned in this respect. On the liability side, financial liabilities were mentioned.

Some undertakings valued participations on a mark to model basis. Three methods for valuing participations were envisaged under QIS5: market value from quoted prices, the adjusted equity method and as a last resort other mark to model approaches. For subsidiaries the first two approaches were the only ones to be used.

The table below shows that for more than half the participations the adjusted equity method has been applied. However the larger participations have been valued applying other mark to model approaches. It is not clear why such a significant number of participations were valued by mark to model. If market prices were not applicable – as would be the case with subsidiaries held by the participating undertakings – it is not clear why the adjusted equity approach was not adopted unless timing issues prevented the gathering of the necessary data.

Table 9: Methods used for the valuation of participations

Method	Share of total number of participations	Share of total value of participations
Market value from quoted active markets	21%	18%
Adjusted equity method	54%	32%
Mark to model	26%	50%

Undertakings did not give much information on the mark to model methods used including on their impact or model errors. Some reported using in-house models or models provided by external parties. In some cases cost-based methods were mentioned. This is not in line with the QIS5 requirements – unless it can be justified under the materiality principle or it can be demonstrated that it is a good proxy for the economic value.

The degree of judgement involved in a mark to model valuation was in some cases underlined by the fact that some undertakings provided alternative calculations with changed assumptions.

3.5. Intangible assets

Most intangibles were valued at nil in the QIS5 balance sheet. Some undertakings valued software as an intangible asset, often justifying this with reference to the valuation in IAS 38 or local accounting standards. A couple of undertakings recognised intangibles in respect of renewal rights and customer relationships, consistent with their audited financial statements.

From the responses it was not always clear which valuation basis was used. In some cases undertakings referred to using a cost basis, which is not in line with the QIS5 specifications, which require the use of an economic value. For example, just recognising the development costs as an asset (which was reported by some undertakings) is not allowed according to QIS5.

3.6. Deferred Taxes

There was substantial variation in the way deferred taxes were recognised and valued. Deferred taxes seem to have been the area of greatest difficulty in the valuation of assets and liabilities other than technical provisions.

The following categories were apparent:

- Undertakings that did not calculate deferred tax assets or liabilities at all. This seems contrary to expectations, because of the valuation differences between QIS5 and tax regimes.
- Undertakings that did not recognise deferred tax assets because of perceived uncertainty about their realisation. Those undertakings have only reported deferred tax liabilities.
- Undertakings that reported deferred tax assets but did not comment on the question regarding whether their realisation within a reasonable time frame is probable.
- Undertakings that reported deferred tax assets and commented that the assessment of whether they could be realised was not possible or made no sense.
- Undertakings that reported deferred tax assets and commented that the assessment of whether they could be realised did not lead to any adjustments.
- Undertakings that explicitly assessed whether their deferred tax assets could be realised and made adjustments accordingly, resulting in a decrease of deferred tax assets or in not recognising any deferred tax assets at all. Often similar criteria to IFRS or local GAAP were used for the assessment.

There is evidence that IAS12 was not followed correctly in many cases. Because of this it is difficult to assess the impact of deferred taxes in the Solvency II regime.

One country advocates the discounting of deferred taxes, on the basis that this would be better in line with the Solvency II valuation principles.

3.7. Contingent liabilities

For a lot of undertakings, the amount of contingent liabilities was reported to be immaterial. Several countries reported that undertakings had difficulties with using the QIS5 valuation methodology at this stage (recognition and valuation need more analysis). Some undertakings did report contingent liabilities, including among others: commitments, guarantees, pledges, insurance and non-insurance-related legal cases and rental contracts.

3.8. Financial liabilities (other than technical provisions)

For a lot of countries financial liabilities did not comprise a significant proportion of total liabilities. However, for some undertakings that had financial liabilities, there appeared to be problems with their valuation.

Some undertakings assessed financial liabilities using IFRS principles on a fair value basis. Many submissions stated that no adjustment was made for own credit risk; there were no comments on any resulting impact.

Others used cost of purchase for initial recognition and the amortised cost method for subsequent measurement, with the justification that these liabilities were short-term,

that they were not prepared to value them differently or that the required valuation method was not clear.

One country reported that the requirements for the yield curve to be used in the valuation of financial liabilities (e.g. subordinated debt) were unclear, particularly in terms of whether or not to include an illiquidity premium.

One country reported that subordinated liabilities were considered without adjustment for own credit risk, as they were considered part of own funds.

3.9. Pension liabilities

A lot of countries reported that undertakings do not have pension obligations. Undertakings that did have such obligations used IAS19 or local GAAP for their valuation. The elimination of the corridor was only mentioned in some cases. Some insurers explicitly reported not having considered the elimination of the corridor. No usage of internal economic modelling for the valuation of pension liabilities was reported explicitly. Several countries mentioned pension liabilities as an area that had to be discussed further.

3.10. Investment funds

Some undertakings used a look-through approach when reporting assets in investment funds, others did not. This may have an impact on any interpretation of the differences between the Solvency I and QIS5 balance sheets and on deferred tax assets.

4. Technical provisions

Under Solvency II, the valuation of technical provisions follows the transfer value principle, under which the value of technical provisions shall correspond to the current amount the insurer would have to pay if was to transfer its insurance obligations immediately to another insurer. To achieve a valuation consistent with this principle, the technical provisions are calculated as a best estimate plus a risk margin. The best estimate corresponds to the probability-weighted average of future cash-flows, taking account of the time value of money. The risk margin represents the cost of providing an amount of eligible own funds equal to the Solvency Capital Requirement necessary to support the insurance and reinsurance obligations over the lifetime thereof.

However, where future cash flows associated with insurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, the value of technical provisions associated with those future cash flows shall be determined "as a whole" based on the market value of those financial instruments. In this case, separate calculations of the best estimate and the risk margin shall not be required.

"Net technical provisions" refers to technical provisions net of reinsurance recoverables.

4.1. Comparison with current regime

It is important to emphasise that the quantitative results must be analysed carefully, as sometimes significant changes in the value of some items on the balance sheet are not the result of a real change in the value of that item, but instead result from its reclassification in the QIS5 balance sheet.

Overall gross technical provisions for all lines of business decreased by 1.4% from Solvency I to QIS5. The main differences between technical provisions under the QIS5 and Solvency I methodologies can be explained by the following:

- the use of a new discounting model including the use of an illiquidity premium;
- the absence of any surrender floor;
- the recognition of future premiums and charges; and
- the use of realistic assumptions in the best estimate calculation (i.e. no implicit prudence margin, although this is partly offset by the inclusion of an explicit risk margin in addition to the best estimate).

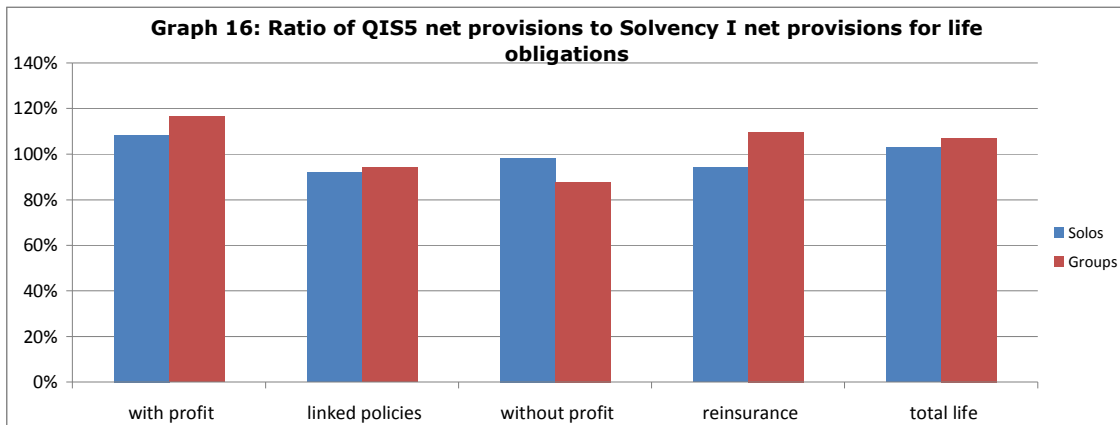
In the valuation of QIS5 liabilities, management actions and policyholders' behaviour, such as lapses, renewals and surrenders, were taken into account.

For life insurance business net technical provisions in QIS5 increased in comparison with Solvency I. This was mainly caused by the decrease in reinsurance recoverables, as gross technical provisions in fact showed a slight decrease of 1.0%.

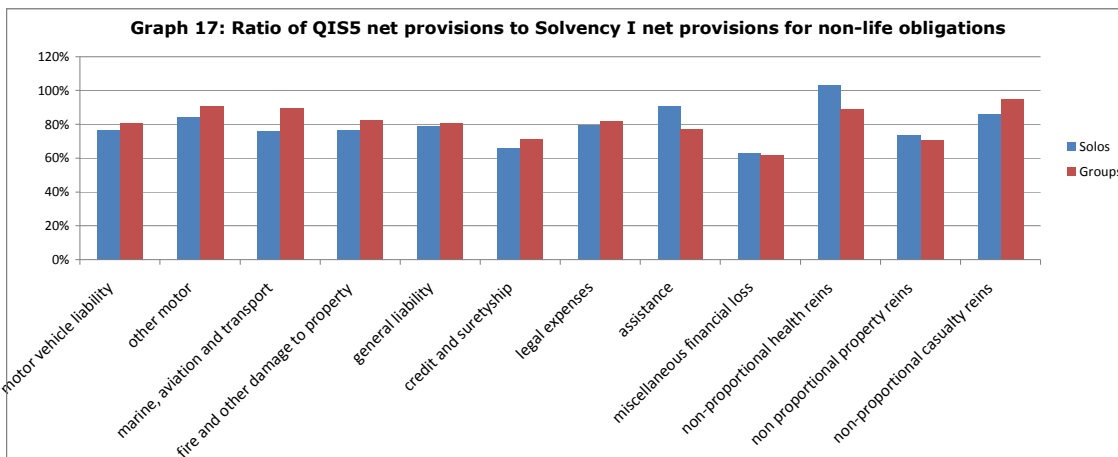
The different interpretations of the contract boundaries definition have led to inconsistency between undertakings and may also have led to incorrect calculation of technical provisions.

The graph below shows a comparison of life net provisions for all QIS5 participants under QIS5 and Solvency I. We note that total net provisions are greater under QIS5 than under Solvency I and that this is an increase of around 3% (for solo

undertakings). Net provisions for with profit business increased by 8% under the new regime.



For most non-life lines of business net provisions have decreased from Solvency I to QIS5; gross provisions for non-life decreased by 24.9%. Please note that equalisation reserves can no longer be included in the technical provisions. The decrease between Solvency I and QIS5 for non-life business is mainly due to the discounting of future cash flows, and the exclusion of the implicit safety margin included in technical provisions through prudent and cautious assumptions, partially offset by the inclusion of an explicit risk margin. The observed changes could also be partially due to different segmentations between the two regimes.



4.2. Discount rate and illiquidity premium

4.2.1. General comment

Based on the amount of the illiquidity premium risk sub-module in the SCR, which corresponds to a reduction of 65% of the illiquidity premium included in the valuation of technical provisions, the effect of the introduction of the illiquidity premium in the valuation of technical provisions in QIS5 can be estimated as being almost 1% of the value of technical provisions (which represents around 15% of SCR).

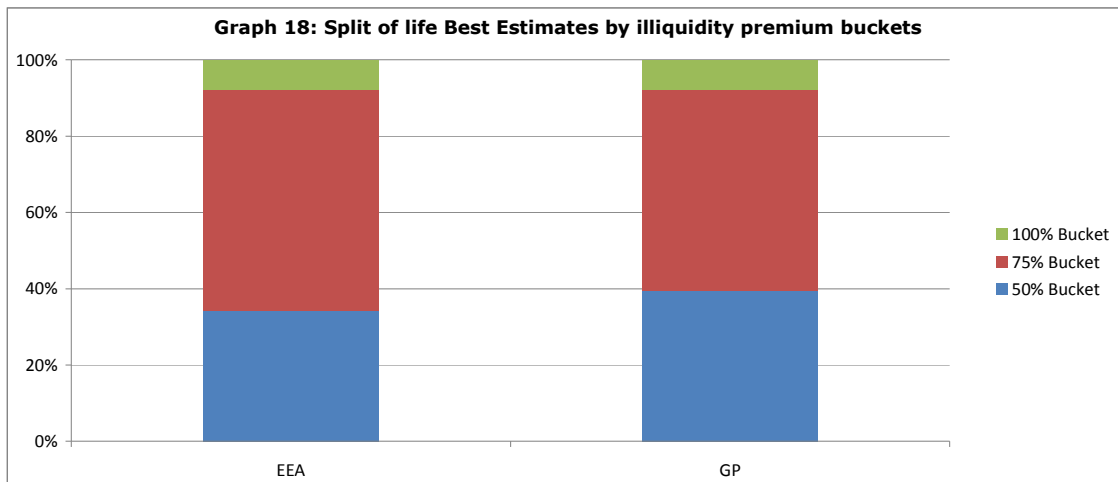
Several countries noted that there were practical difficulties with the illiquidity premium, for example in calibrating economic scenario generators to varying discount rates, and felt that further detailed guidance is needed.

Negative forward rates

It was noted that applying the illiquidity premium to spot (rather than forward) rates led to technical difficulties (negative forward rates). It was noted that negative forward rates are a technical anomaly which can cause significant calculation problems, and that this issue needs to be addressed before Solvency II is implemented.

4.2.2. Illiquidity premium buckets

The graph below shows that the illiquidity premium buckets of 75% and 50% were most used by undertakings⁹.



50% Bucket

The most common products where 50% of the illiquidity premium was used were non-life in general, unit- and index-linked business, life without profit participation, SLT (Similar to Life Techniques) health, non-SLT health and reinsurance (both life and non-life). Some undertakings also used 50% of the illiquidity premium for life insurance with profit participation, pure savings products and longevity swaps.

75% Bucket

The most common products where 75% of the illiquidity premium was used were life insurance with profit participation in general, pure savings products, unit- and index-linked insurance with guarantees, and various types of annuities. Some undertakings also used the 75% bucket for SLT health, non-life, non-SLT health, life reinsurance, annuities from non-life, and life insurance without profit participation.

⁹ The graph does not include non-life provisions, as these were all to be allocated to the 50% bucket.

100% Bucket

The most common products where 100% of the illiquidity premium was used were different types of annuities (including annuities from non-life). 100% of the illiquidity premium was also used for retirement business in run-off, unit-linked insurance, non-life insurance, and non-SLT health insurance.

Many supervisors reported inconsistent application of the illiquidity premium buckets across insurance undertakings. It was noted that detailed guidance is needed on what products attract the illiquidity premium and to what extent. It is, for instance, unclear how group annuity policies should be treated and whether they should be included within the 50% or 100% bucket. Also, some undertakings used criteria such as whether or not annuities are in payment and whether or not there is an option to lapse within the product to separate the 75% bucket and the 100% bucket. Some supervisors also highlighted the practical difficulties that undertakings experienced when applying the illiquidity premium to various buckets. Some countries suggested a reform to the approach that was tested in QIS5. While one country was explicitly against its inclusion at all, a number of others questioned the applicability of the illiquidity premium to all liabilities. Further consideration or guidance was particularly requested on whether the illiquidity premium is appropriate for unit-linked business and how hybrid products would be unbundled. Opinions were mixed on the number of buckets required, with some countries requesting a two-bucket structure of 0 and 100%, and the majority making no comment. One supervisor would prefer to restrict the application of the illiquidity premium to an approach based on transitional measures for specific types of insurance business, and to other cases only in stressed conditions.

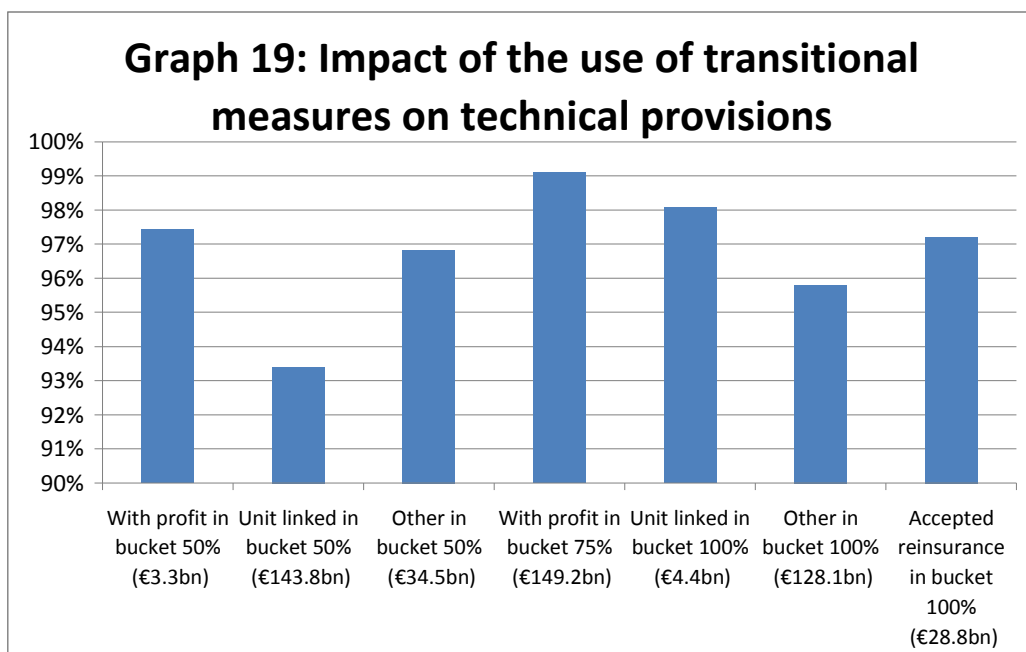
4.2.3. Practicability issues

It was noted by one country that the nature of the QIS exercise as a point in time test meant that any analysis around countercyclicality was limited at best, and also that further thought is necessary as to the exact calculation of the amount of illiquidity premium available in the market.

Clarity and consistency are required to adequately determine how the illiquidity premium should be attached to various types of business, particularly insurance with profit participation and business which produces negative technical provisions.

4.2.4. Transitional measures

Three countries provided data on the potential impact of transitional measures on technical provisions. According to the data available, the transitional measures can have an impact on all types of business (unit-linked, with and without-profit business) with a magnitude varying from 1% to 7% of the value of technical provisions without transitional measures, depending on the product and the bucket of the illiquidity premium. The amount of technical provisions after the potential effect of transitionals is shown in the graph below as a percentage of pre-transitional technical provisions, with the total post-transitional technical provisions also given in absolute terms.



The vast majority of respondents did not see transitionals as material in their market. Transitional measures were strongly supported by two countries which see them as a vital measure for their industries, in particular for long-term liabilities. Another country noted that whilst transitionals would not currently have an effect, they might do at the Solvency II Directive implementation date. The most common product to which transitionals were applied was annuities (immediate and deferred), including bulk annuities.

Many countries did not identify any products which would be eligible for transitional discount rates, often because such an approach would not be applicable under current legislation and hence was disregarded. Some supervisors in countries where transitionals were applied noted that for some undertakings there was uncertainty as to what products the discount rate transitional is intended to apply to. In particular it was not clear whether the transitional should only apply to those products in the 100% bucket.

4.3. Risk margin

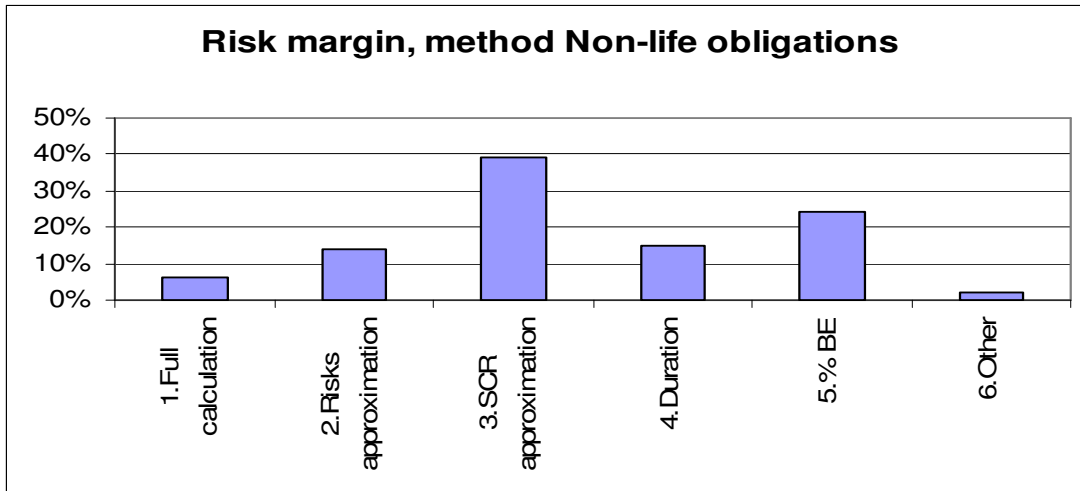
4.3.1. Practicability

Very few undertakings across Europe reported having used the full calculation approach for the valuation of the risk margin. Almost all supervisors noted that a full calculation was often too complex and time-consuming for undertakings.

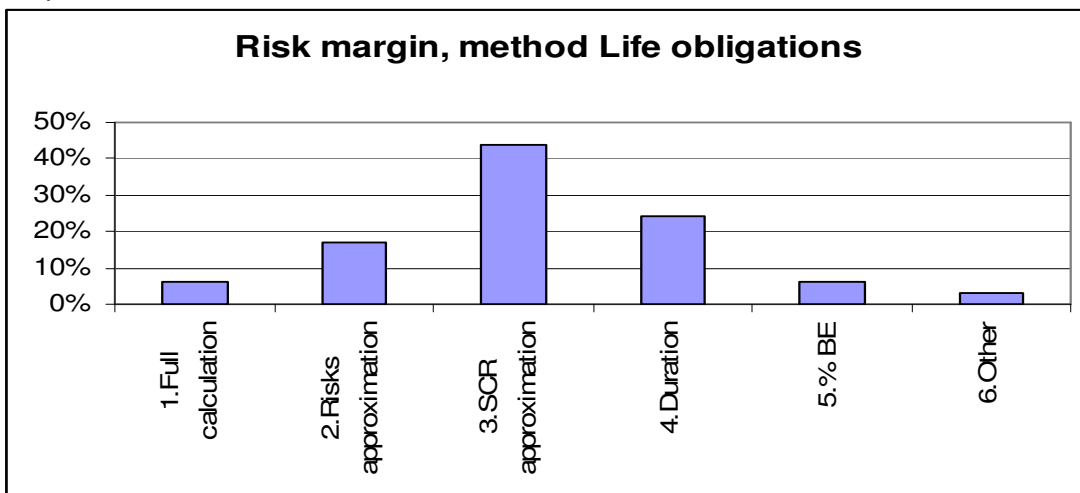
Undertakings have therefore largely used the proposed simplifications. Because the calculation was so burdensome, supervisory authorities often supported the use of simplifications, some of them also pointing out that the relative immateriality of the risk margin means that it does not justify such difficult calculations.

The graphs below show the choice of simplification made by undertakings across Europe.¹⁰

Graph 20:



Graph 21:



Some supervisory authorities expressed a concern that the different methods could give divergent results, possibly leading to opportunities for regulatory arbitrage; some authorities therefore wondered whether the number of simplifications should be reduced or whether it would be useful to explicitly give guidance on the choice of method.

One supervisor questioned the reliability of the simplifications in general. In particular it was pointed out that some simplifications may give abnormal results for specific products: this was especially the case for some business where the main assumption underlying the calculation (that future SCRs for the reference undertaking and best

¹⁰ The approaches referred to here were outlined in the QIS5 Technical Specifications as follows:

1. Make a full calculation of all future SCRs without using simplifications.
2. Approximate the individual risks or sub-risks within some or all modules and sub-modules to be used for the calculation of future SCRs.
3. Approximate the whole SCR for each future year, e.g. by using a proportional approach.
4. Estimate all future SCRs "at once", e.g. by using an approximation based on the duration approach.
5. Approximate the risk margin by calculating it as a percentage of the best estimate.

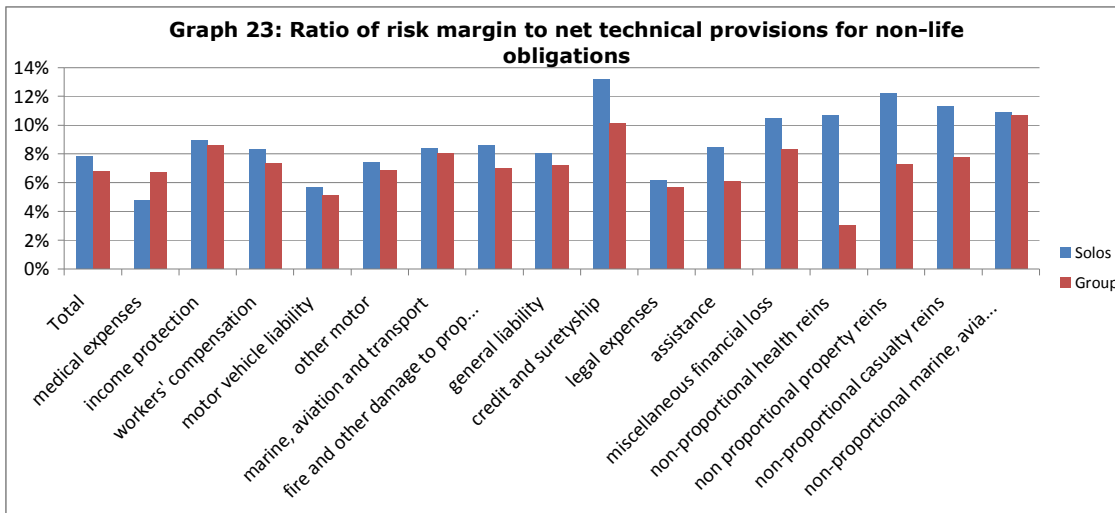
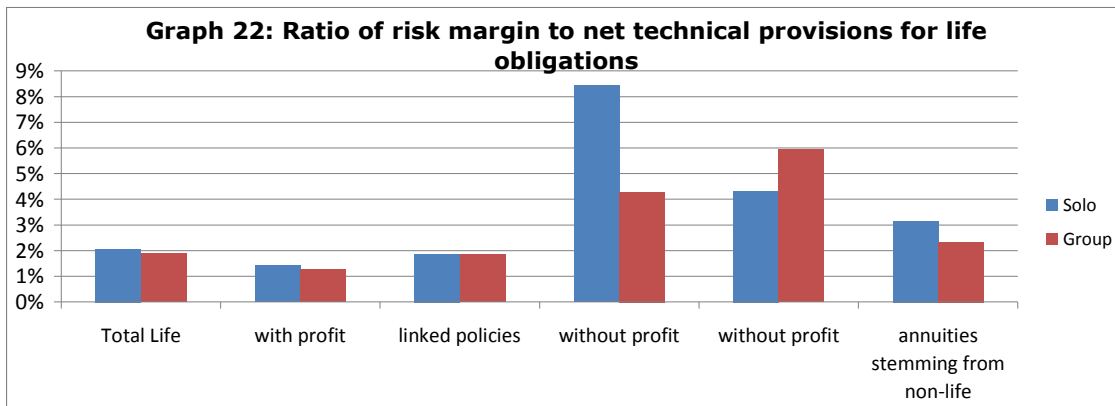
estimates are proportional) did not necessarily hold true (especially in life and health where future premiums are taken into account).

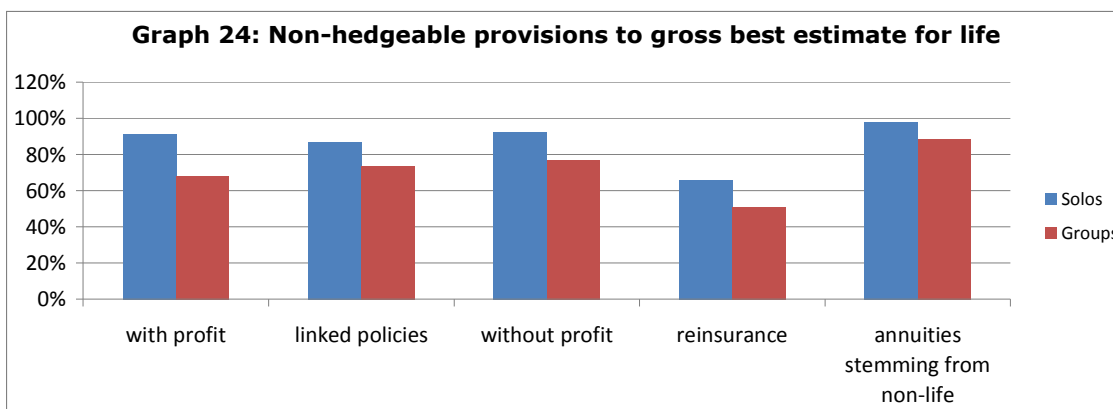
There is currently also an issue with the use of simplifications where the best estimate is negative, because all the simplifications from levels 3 to 5 are based on the assumption that the risk margin is proportional to the best estimate. The supervisors affected therefore felt it was important to develop simplifications that would still be robust in the case of negative best estimates.

In the opinion of one country, undertakings should not take into account catastrophe risk in calculating future SCRs, since catastrophic claims are reported relatively quickly.

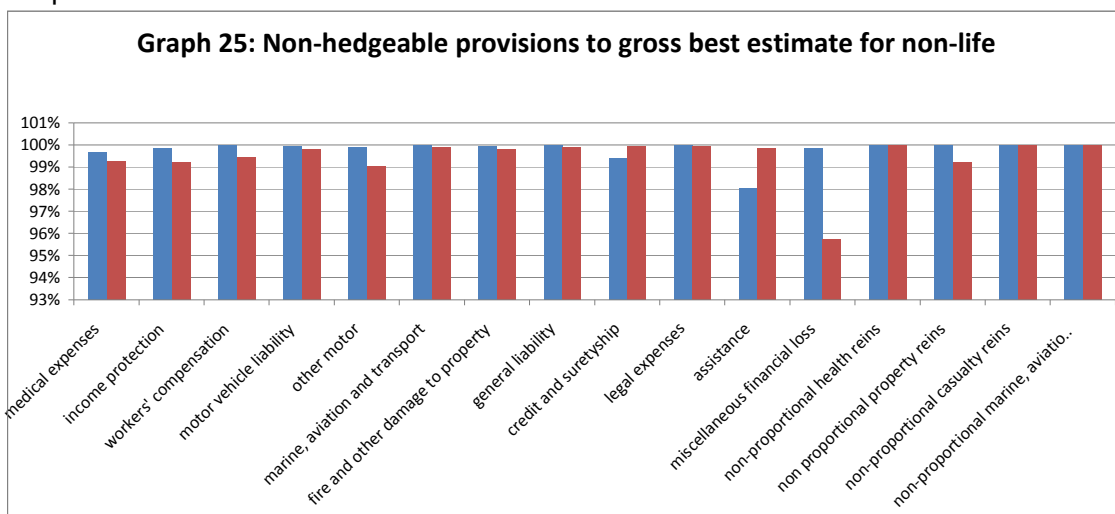
As shown in the graph, for EEA solo undertakings the risk margin is higher as a proportion of net best estimate for business without profit participation compared to other lines of business.

For some non-life lines of business the ratio is a bit higher than 10%.





Graph 25:



The two graphs above show the percentage of total provisions which could not be reliably replicated by assets with an observable market value, and which were calculated as a best estimate plus risk margin. They show that the percentage of technical provisions calculated as a whole (those which could be reliably replicated by assets with an observable market value) in QIS5 is almost nil in non-life, while it is material in life, especially in reinsurance.

4.3.2. Unavoidable market risk

Lots of questions were raised regarding the inclusion of unavoidable market risk for the calculation of the risk margin. There was no detailed guidance in the technical specifications on how to interpret and calculate unavoidable market risk.

Almost all non-life undertakings followed the simplifications stating that it is likely that this unavoidable market risk is nil for them.

Life undertakings often calculated unavoidable market risk when the duration of their liabilities was longer than the maturity of assets on an active market (often considered to be 30 years), as hinted by the technical specifications. Many different approaches were used for the calculation, including the simplification proposed in the technical specifications, a recalculation of the interest rate sub-module capital charge to tackle the mismatch.

Two other examples of unavoidable market risks were quite often quoted by undertakings:

- the illiquidity premium risk for those who use a replicating synthetic portfolio to value their liabilities; and
- the mismatch between this artificial portfolio and a portfolio that could actually be bought.

Due to the lack of homogeneity among the answers it is however not meaningful to derive statistical figures for the unavoidable market risk in life business. The majority agree that there is a need for further clarification on the methods to be used.

4.3.3. Values

At European level, the ratio of risk margin to technical provisions is on average the following:

Table 10: Breakdown of life technical provisions and risk margin

	Life TP breakdown ¹¹			RM / BE
	As a whole/ total TP	BE/total TP	RM/total TP	
Life TP - with-profit	18.64%	79.89%	1.46%	1.83%
Life TP - linked policies	29.11%	69.32%	1.56%	2.26%
Life TP - without-profit	12.81%	80.56%	6.64%	8.24%
Life TP – reinsurance	37.21%	58.89%	3.90%	6.63%
Life TP - annuities stemming from non-life contracts	11.82%	85.92%	2.26%	2.63%
Total life	21.95%	76.02%	2.03%	2.67%

Table 11: Ratio of risk margin to technical provisions for non-life

Line of business	RM / gross TP
Medical expenses	4.72%
Income protection	8.74%
Workers' compensation	8.33%
Motor vehicle liability	5.32%
Other motor	7.28%
Marine, aviation and transport	5.36%
Fire and other damage to property	7.21%
General liability	6.39%
Credit and suretyship	10.56%
Legal expenses	5.70%
Assistance	6.50%
Miscellaneous financial loss	7.63%

¹¹ For some life business (liabilities which could be reliably replicated by assets with an observable market value) technical provisions were calculated "as a whole" rather than as a best estimate and risk margin. As such the risk margin/best estimate ratio, relates only to those liabilities not calculated "as a whole".

Non-proportional health reins	9.31%
Non-proportional property reins	11.18%
Non-proportional casualty reins	9.02%
Non-proportional marine, aviation, transport reins	8.17%
Total non-life	6.75%

These aggregated figures may trigger further consideration of the appropriateness of method 5 (proportion of the best estimate) or at least its calibration, because if this had been used, it would have given the following results (bearing in mind that method 5 does not explicitly allow for diversification between lines of business):

Table 12: Ratio of method 5 risk margin to technical provisions for non-life

Line of business	RM / TP
Medical expenses	7.83%
Income protection	10.71%
Workers' compensation	9.09%
Motor vehicle liability	7.41%
Other motor	3.85%
Marine, aviation and transport	6.98%
Fire and other damage to property	5.21%
General liability	9.09%
Credit and suretyship	8.68%
Legal expenses	5.66%
Assistance	6.98%
Miscellaneous financial loss	13.04%
Non-proportional health reins	14.53%
Non-proportional property reins	6.54%
Non-proportional casualty reins	14.53%
Non-proportional marine, aviation, transport reins	7.83%
Total non-life	7.83%

4.4. Segmentation

Segmentation of data according to the QIS5 specifications was often not consistent with the segmentation used for current reporting. Undertakings indicated that current reporting systems were not always granular enough to allow accurate segmentation. Many undertakings were unable to make the appropriate changes to their systems in advance of QIS5. Therefore some undertakings reported using pragmatic approaches to make the allocation for the purposes of QIS5.

In most countries, undertakings reported that the guidance on segmentation was not sufficiently clear. This may have led to different interpretations of the required segmentation. Only a couple of countries reported that undertakings did not mention any problems with the segmentation.

A number of life and non-life undertakings indicated that the segmentation of policy contracts used in QIS5 was difficult or unclear, including the segmentation into proportional and non-proportional reinsurance treaties.

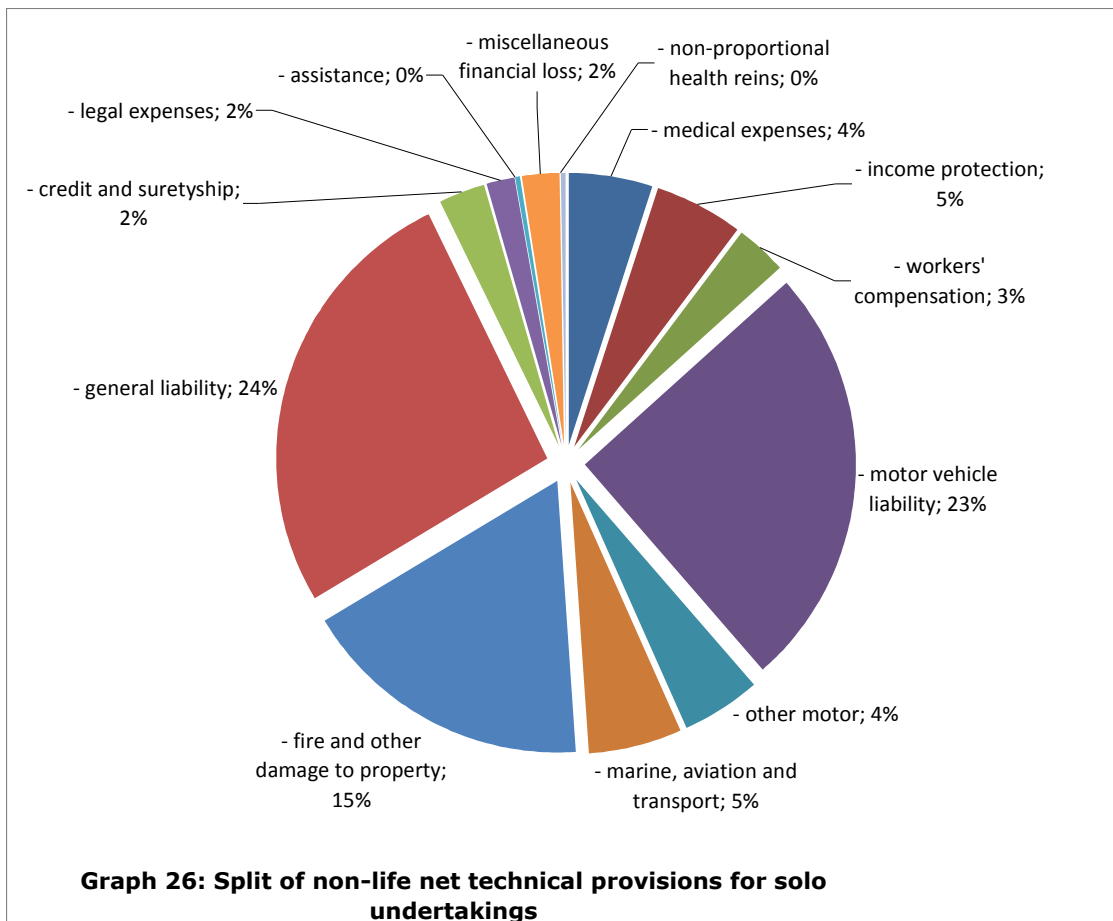
4.6.1. Life

Almost all countries reported difficulties with the second level of segmentation (death, survival, disability/morbidity, saving). The main issue is the idea that a contract is classified according to the main risk driver at inception of the policy and does not need to be reclassified over the life of the policy. Undertakings were of the view that this approach materially distorts the picture, as the nature of a policy changes over time. Some life undertakings indicated their support for segmentation according to the relevant risk at reporting date.

Moreover undertakings in several countries reported that it was unclear when to unbundle a contract.

A few countries reported problems with the segmentation of some hybrid contracts (e.g. unit-linked products combined with guarantees).

4.6.2. Non-life



The above chart shows that in QIS5 the principal lines of business for non-life technical provisions were motor and general liability insurance, followed by fire. These three lines of business between them represent almost two thirds of non-life technical provisions.

Undertakings gave some examples of areas where the QIS5 segments were not sufficiently granular. They stated that risks within some segments can vary from small individual risks to large industrial risks and that these risks are inherently quite different. Typical examples given are the following segments:

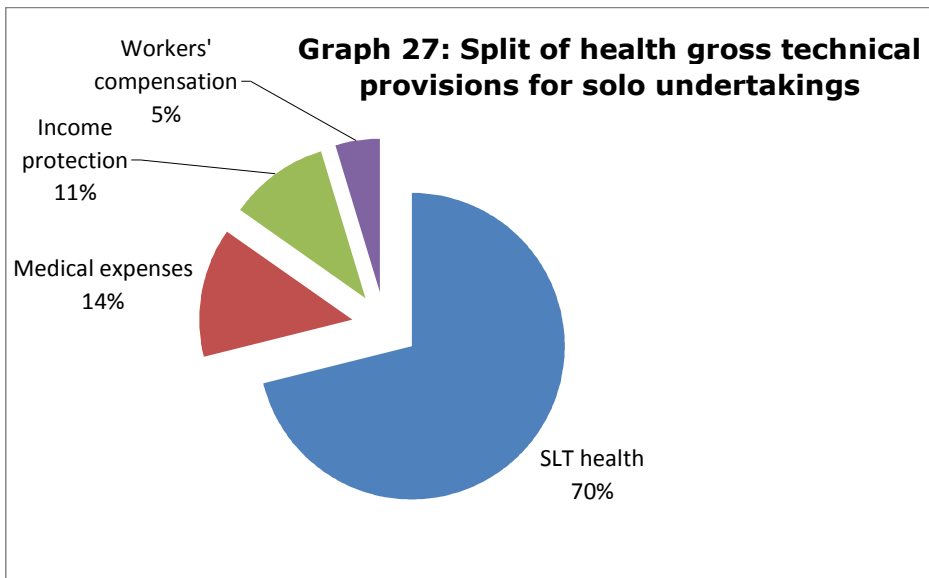
- Fire and other property damage
- Marine, aviation and transport
- Miscellaneous non-life insurance

Some undertakings commented that it would also be helpful to distinguish between material losses and personal injuries in the third party liability line of business (LoB).

In some cases it was indicated that it was unclear when non-life obligations became life obligations (annuities).

In some countries undertakings reported that it was difficult to split motor business into "motor vehicle liability" and "motor other". In some cases undertakings were able to split claims, if these risks were modelled separately. Premiums, however, could not always be split this way since an individual contract (and premium) covered both aspects.

4.6.3. Health



In QIS5 most health technical provisions related to Similar to Life Techniques (SLT) business. Of the non-SLT business, the largest component was medical expenses followed by income protection.

The criteria for segmenting health business between SLT and non-SLT were considered open to interpretation, leading to uncertainty in the case of some specific lines of business.

Some supervisors indicated that the layout of the CEIOPS spreadsheet added to the uncertainty. The allocation of annuities in payment was also considered to be a problem by some participants.

Two countries reported that undertakings found it relatively difficult to correctly perform the appropriate allocation to the defined lines of business given the complexity of health business.

In some countries, undertakings had difficulties with the segmentation of accident insurance into non-SLT health as some "accident" contracts do not fit into the current health/non-life segmentation.

One supervisor remarked that the technical specifications are somewhat ambiguous regarding the classification of disability and morbidity business into life and health. However, they stated that overall this did not lead to a significantly different assessment of the underlying risk, with the exception of the SCR catastrophe risk module. It was indicated that further clarification in this regard is needed.

Finally, some supervisors indicated that undertakings running workers' compensation business criticised the QIS5 approach for its lack of clarity on segmentation and its implementation.

4.5. Contract boundaries

Many participants found the definition of contract boundaries unclear and some even suggested that the technical specifications, their annexes and the answers provided in the Q&A procedure were not always consistent. This has led to differences in application.

Therefore, a majority of supervisory authorities stated there was a need for further refinements in order to reduce the heterogeneity of practices and to ensure a level-playing field.

Many industry participants declared themselves to be in favour of applying the principles set out in the Exposure Draft of the expected IFRS 4 standards, as they think they better represent the economic value of their portfolios. In some countries, participants also mentioned that it was possible that the framework tested in QIS5 was not fully aligned with the Level 1 Text in all cases.

Some supervisory authorities referred to specific contracts that are of paramount importance in their countries. In these cases the implications of widening or restricting the boundaries are huge and may lead to misrepresentation of obligations towards policy-holders: unit-linked contracts, savings products, non-life riders to life contracts, supplementary health, and contracts providing group coverage.

Several supervisory authorities explicitly supported the industry's position, whereas others commented that it was more important to ensure the most efficient risk-based approach was used, and to avoid cherry-picking by the industry between IFRS and Solvency II on particular issues, particularly since IASB will not necessarily endorse all the features of the Exposure Draft.

In general, irrespective of their position on convergence with IFRS, supervisory authorities shared the view that the principles set out in the technical specifications may have unintended consequences. Undertakings may grant more benefits or modify their terms and conditions in order to extend the amount of cash flows considered to be within the boundaries of profitable contracts. One supervisor also noted a link between contract boundaries and the illiquidity premium, observing that extending the

contract boundaries would add further uncertainty to the cash-flow projections used in the best estimate calculation.

Participants and supervisory authorities also pointed out the difficulty of interpreting what should be considered an “unlimited ability to amend the premiums or the benefits under the contract”.

Linked with their desire for greater convergence with the IASB’s work, many participants mentioned that the determination of the boundaries of a group contract should be at the time when a reassessment of risk is possible at individual level, rather than the time when it is possible at group level.

EIOPA has already provided feedback on this issue in response to IASB’s Exposure Draft.

Some supervisory authorities also mentioned practical difficulties encountered by their countries with the recognition of contract boundaries, especially for non-life business, mainly because IT systems were not yet able to include tacit renewals in the current valuation process. Some authorities think it may be useful to add clarifications on what is meant by “becoming a party” in terms of liability recognition.

Aside from the theoretical concepts, some participants also seem to have struggled to collect robust data from which to derive reliable assumptions around policyholders’ future behaviours, in terms of lapse or renewals and in terms of possible evolutions of the underlying risks.

It is important to note that the contract boundaries question may have consequences for other parts of the regime, including EPIFP (see own funds section for further details), SCR lapse risk and the calibration of non-life premium and reserve risk.

4.6. Other feedback

4.6.1. Life technical provisions

The industry reported general problems with respect to resources, experience, methodologies, limitations on available data and runtimes for stochastic models. Undertakings indicated that in some cases the generation of scenarios was expensive or that a large amount of work was required to model a comparatively small liability. Insurers generally intend to solve these problems by increasing resources and developing their capabilities and methodologies.

Industry also indicated difficulties with the valuation of options and guarantees, the modelling of policyholder behaviour and the reflection of management actions. Availability of software and data was part of the problem. However problems with the valuation of options and guarantees were not always seen as material.

More advanced problems that were reported were around the appropriate level of illiquidity premium to be used for the calculation of technical provisions, calibrating economic conditions for economic scenario generators to negative forward rates, and limitations in current stochastic valuation models.

Participants reported general challenges around assumptions and methods regarding:

Assumptions:

- Policyholder behaviour
- Future discretionary benefits
- Future management actions
- Catastrophe risk
- Validation of input and output from economic scenario generators

Methods:

- Valuation of options and guarantees
- Stochastic modelling

Supervisors generally reported similar areas of focus to those mentioned by insurers. Valuation of options and guarantees and assumptions on policyholder behaviour were of general concern. One country characterised the valuation of options and guarantees as a black box and stated that it is hard to check the reliability of the best estimate.

Management actions

The impact of management actions was generally reported as less than 2% of total technical provisions. However in several countries as many as 30 % of undertakings indicated an impact of more than 5%. Some insurers did not take management actions into consideration but acknowledged that they may have some impact, whereas others did not see them having any impact at all. Management actions may also be limited in some cases due to contractual rules related to the insurance policies.

Methods

The following methods were used to calculate technical provisions: Monte Carlo simulations, closed form stochastic approaches and deterministic approaches. The choice of method applied varied across countries.

It should be noted that EIOPA does not endorse any of these methods as a default. In principle, under the proportionality assessment process the obligation is on the insurer to select a method for the calculation of technical provisions which is designed in a way that adequately captures the underlying risks. Depending on the individual risk profile of the business, this generally allows a variety of approaches to be taken.

Monte Carlo simulations

In Monte Carlo simulations, in most countries the majority of firms used 1000 simulations. Some countries reported more than 2000 and in a few cases even more than 5000 simulations.

For those insurers that replied to the question on Monte Carlo error statistics the error was generally less than 2%, but also in some cases larger than 6%.

Deterministic approach

Historical experience was used in assessing policyholder behaviour. Some undertakings questioned whether policyholders behaved rationally. In some cases countries reported the use of an approach developed on a national level.

In one country surrender option probability was seen to increase with policy age. For some undertakings deterministic results were found to be comparable to stochastic results calculated by Monte Carlo method.

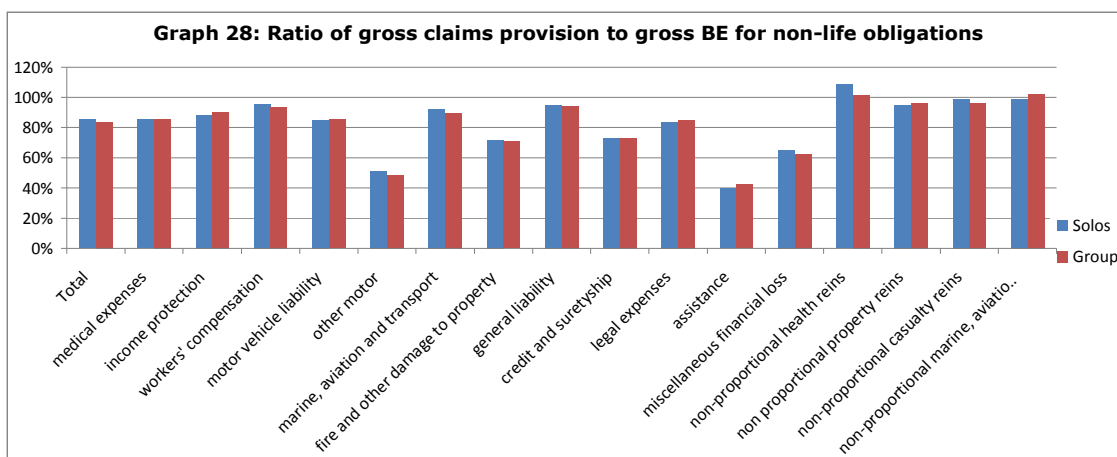
Future discretionary benefits (FDB)

As highlighted in previous exercises, the feedback shows that further clarification in this area is still needed. Although further details were provided in the technical specifications, several undertakings still experienced difficulties in interpreting the technicalities of FDB. This could also have affected the results. One country particularly highlighted the calculation of FDB as an area where undertakings had experienced serious difficulties and interpretation issues and where the supervisor had major concerns.

4.6.2. Non-life technical provisions

Most countries do not expect radical changes in the methodologies adopted by undertakings for the valuation of non-life claims provisions, but rather an adaptation of those methodologies to the specificities of the Solvency II framework. Some supervisors noted that it is difficult to assess the reliability or adequacy of the results. This would require more detailed information on the assumptions and parameters used and on the quality of the underlying data, which was not feasible in the framework of the QIS exercise.

It appears that particular attention needs to be given to the valuation of premium provisions and the recognition of catastrophe (CAT) claims. Several countries indicated that it would be helpful to have further guidance on how to calculate the best estimate for premium provisions, with attention paid to the treatment of acquisition expenses and other costs, as well as the derivation of the combined ratio per line of business (LoB).



Premium provisions

Most undertakings reported using proxy techniques to calculate premium provisions. The second simplification described in the technical specifications (expected claims ratio) has been widely used.

Most undertakings expressed a desire to improve on the methods used in QIS5. Some participants took the view that the method based on the expected claims ratio which is described in the technical specifications is already sufficiently risk-sensitive and did not see the need to develop more sophisticated approaches. Given that in most cases calculation of the premium provision through projection of cash flows was not possible due to the lack of appropriate historical data, the most important next step which undertakings are planning to take is collecting more data and enhancing the quality and granularity of data available, with special regard to information about segmentation of products, lapse options, future premiums, expenses, binary events and CAT claims. In addition, several undertakings noted a need to improve and clarify the treatment of contract boundaries.

Claims provisions

As reported in previous exercises, run-off triangles were widely used by undertakings in the determination of the best estimate of claims provisions. Generally the chain-ladder or Bornhuetter-Ferguson methodology was applied, occasionally with adjustments for claims inflation.

Other methods mentioned by some undertakings were Mack, Fisher Lange, the stochastic method, using the tool provided by CEIOPS, the expected claims ratio method, the method by Hodes, Feldblum & Blumsohn, and the Benktander method.

The most common techniques adopted by undertakings to calculate claims provisions were:

- Chain-ladder techniques based on paid claims, claims incurred or number of claims;
- Bornhuetter-Ferguson techniques based on paid claims or claims incurred;
- De Vylder least squares;
- Loss ratio methods;
- Stochastic, for example bootstrap or Mack methods; and
- Frequency/severity analysis.

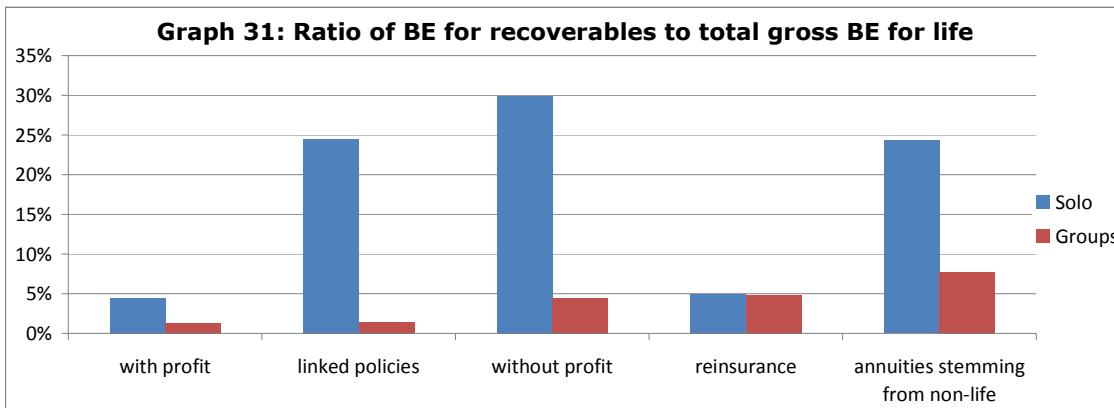
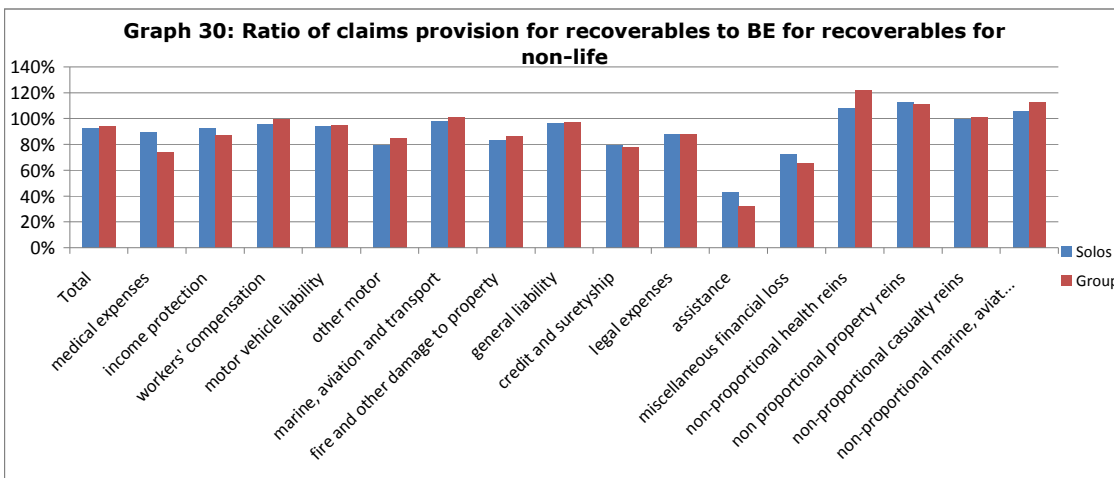
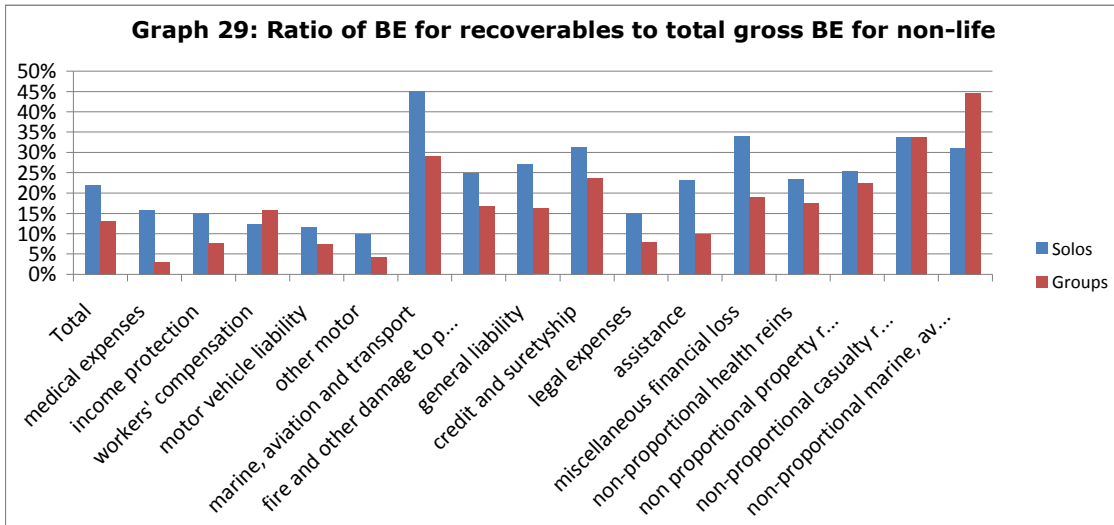
Often these techniques were used to derive best estimate provisions gross of reinsurance. In such cases, amounts net of reinsurance were determined using one of the Gross-to-Net proxies provided in the specifications or similar techniques.

Claims which had been reported but not yet settled, particularly large claims and claims of an exceptional nature, were dealt with on a case-by-case basis by undertakings in many countries. Actuarial judgment was applied to determine the most appropriate method.

Most of the participants do not report any plans for enhancement of the methods that were used in QIS5, except that the methods must be improved to include the effects of inflation. Some undertakings reported an intention to introduce stochastic models.

4.7. Reinsurance recoverables

The graph below shows a comparison between the best estimate (BE) for recoverables and the gross best estimate for provisions in non-life, and indicates that for the marine, aviation and transport (MAT) line of business the best estimate for recoverables represents approximately 45% of the total gross best estimate for provisions. Several other lines of business show ratios greater than 30%.



Participants reported encountering difficulties with calculating the probability of expected default of counterparties. This was either because it was difficult to understand what was specified in QIS5 or because undertakings did not agree with the specifications. In many cases undertakings reported a lack of data, which for instance ruled out the calculation of run-off triangles.

Most participants calculated their reinsurance recoverables by subtracting the net best estimates from the gross best estimates. Few participants conducted cash flow projections and simulations.

It was commented that the net best estimate per line of business could be hard to calculate in some cases, when a single reinsurance treaty dealt with several lines of business.

Most countries indicated that special purpose vehicles are of minor importance for most undertakings.

Supervisors indicated that determining the unadjusted best estimate reinsurance recoverables did not seem to present any particular challenges. However there was more uncertainty around the calculation of the expected counterparty default adjustment, with extensive reliance on rating agency assessments for probability of default.

Some supervisors indicated that it was difficult to check whether the adjustment for expected counterparty default had been properly taken into account. Others indicated that there was a concern around the lack of rating for certain third-country reinsurers.

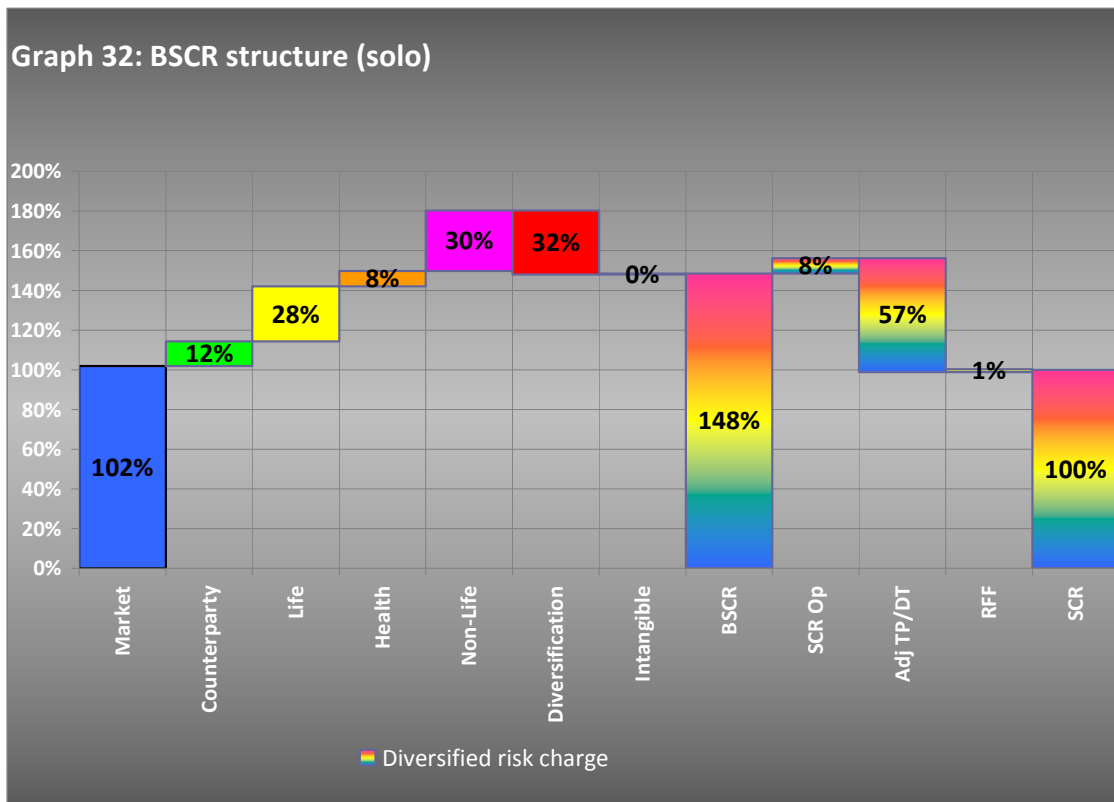
5. SCR – Standard formula

5.1. The overall SCR

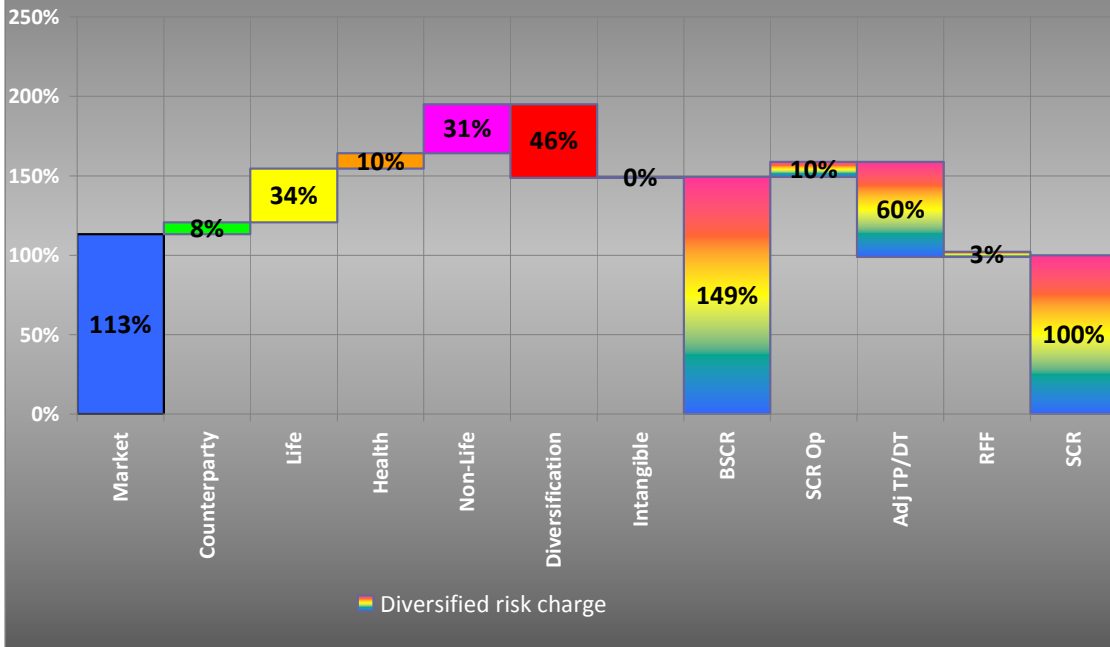
The Solvency Capital Requirement (SCR) is the risk-based capital requirement for undertakings under Solvency II. It is calibrated to a 99.5% Value at Risk confidence level over one year. In structure the SCR is composed of a number of 'modules' which in turn are composed of 'sub-modules'. The capital requirements arising from these sub-modules and modules are aggregated using a correlation matrix.

Composition of the SCR

The chart below shows the composition of the SCR for Europe as a whole, first for solo undertakings and then for groups.



Graph 32: BSCR structure (groups)

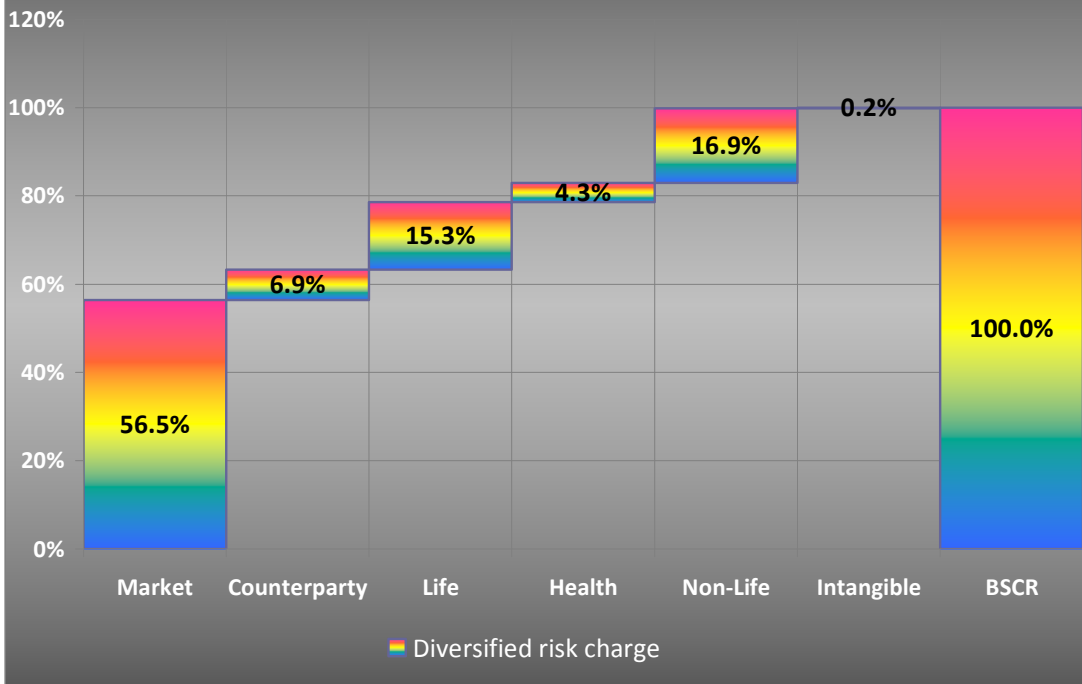


This graph masks significant differences between different types of business, table xSCR1 in the annex shows those distributions.

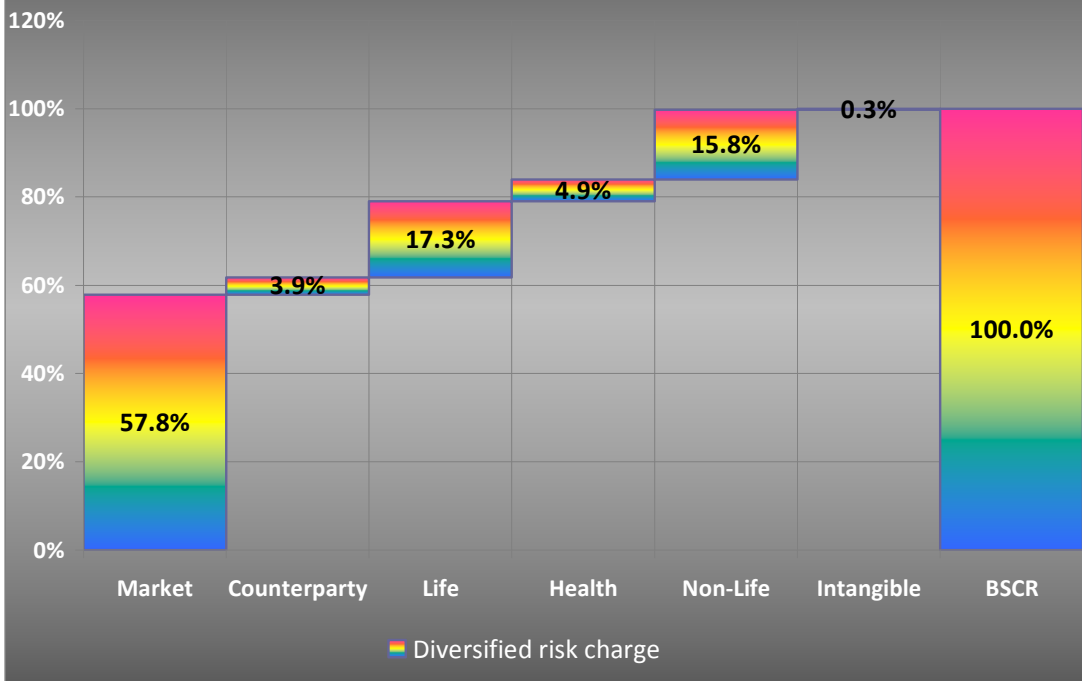
Diversification benefit is an important component of the SCR, and the below table divides the diversification benefit between the risk modules.

The diversification at group level is understandably higher as groups generally include entities conducting a varied range of activities and thereby generating more diversification. For detailed analysis of the impact of diversification on groups please see section 9.3.

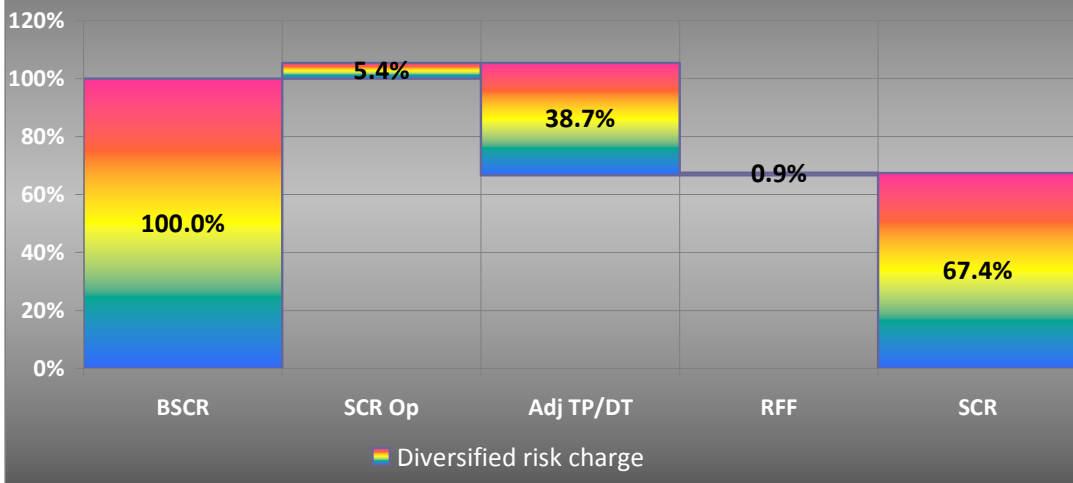
Graph 33: Diversified BSCR structure - All undertakings (solo)



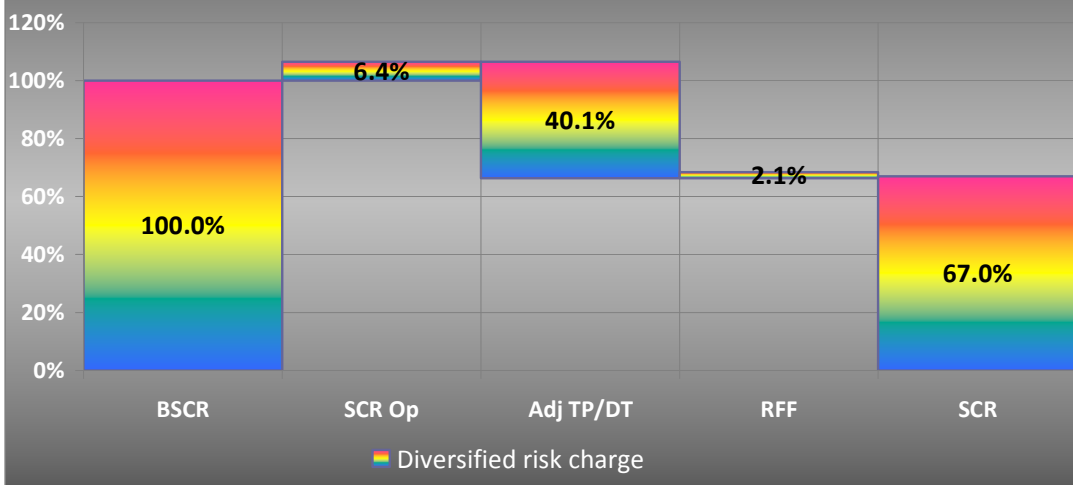
Graph 33: Diversified BSCR structure - All undertakings (groups)



Graph 34: SCR Structure - All undertakings (solo)

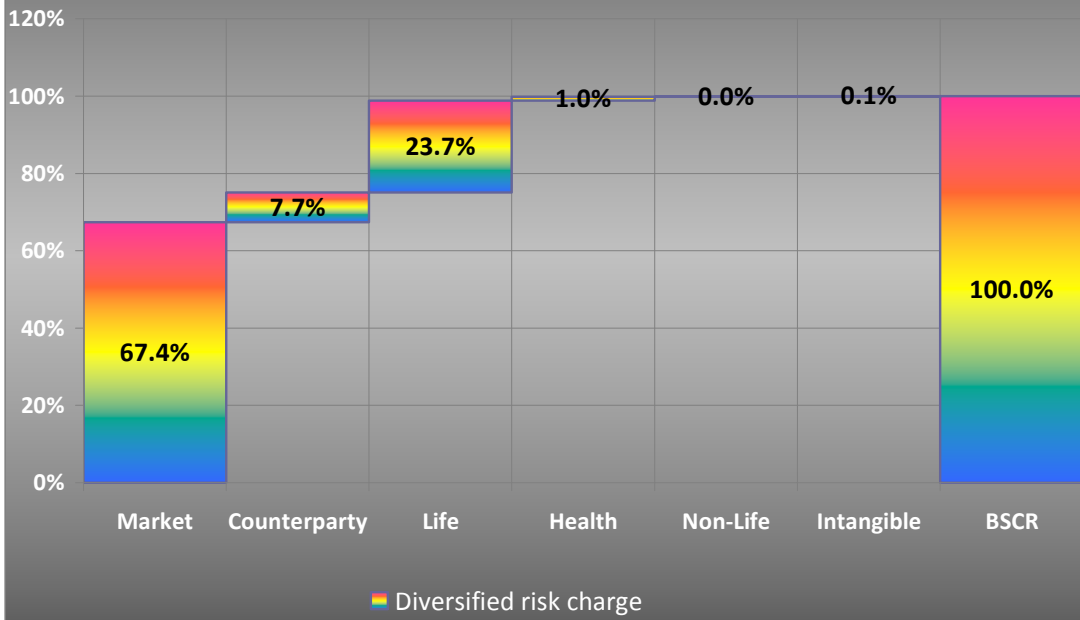


Graph 34: SCR Structure - All undertakings (groups)

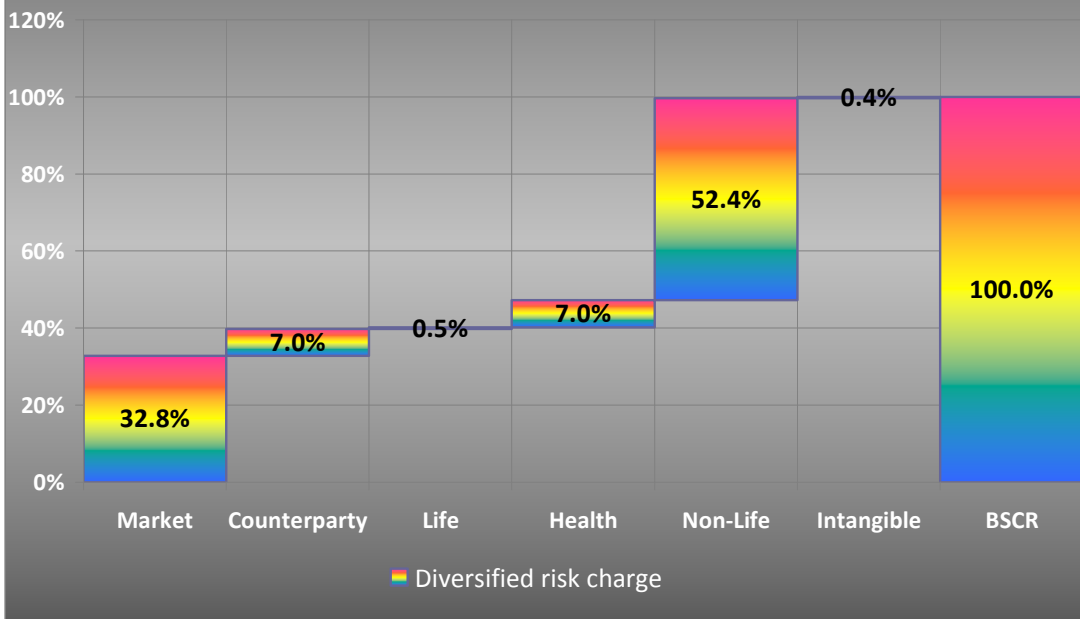


The charts below reproduce this analysis for undertakings which write predominantly life business and undertakings which write predominantly non-life business. As would be expected, life undertakings have very little underwriting risk arising from anything other than life but relatively more market risk, while in the case of non-life undertakings the most significant risk is non-life underwriting and the share of market risk is smaller.

Graph 35: Diversified BSCR - Life undertakings (solo)



Graph 36: Diversified BSCR - Non-life undertakings (solo)



Major SCR Issues

Some parts of the standard formula SCR led to little comment from undertakings (such as life underwriting and aggregation). Other areas had more comments, particularly around difficulty of calculation.

Whilst these areas are covered in considerable detail in the remainder of the report, the following provides a brief summary:

- Non-life catastrophe risk attracted comments on methods, calibration, data availability and the effort required to calculate the risk charge.
- Counterparty default risk attracted significant comment on the difficulty of applying the full calculation and whether the methods are proportional to its relative lack of importance for many undertakings.
- The correct calculation of loss absorbency of deferred taxes caused problems for some.
- The equivalent scenario was less widely-used than the modular approach, and where it was used there was greater uncertainty around the results. Almost all countries reported shortcomings with the method on both complexity and more theoretical grounds.
- Lapse risk caused difficulties for both life and non-life undertakings with life undertakings strongly objecting to the requirement to model the risk at policy level, and non-life undertakings noting that in many cases they did not have systems and processes in place to model the risk.
- The look-through test proved difficult for some, with guidance requested on the application of proportionality.

Risk mitigation techniques are covered separately below as they span a number of areas within the standard formula. There was a general theme of difficulties with risk mitigation in relation to counterparty default risk, catastrophe risk, and other areas.

5.2. Single equivalent scenario methodology

The QIS5 Technical Specifications defined the single equivalent scenario as the default method for determining the SCR. However, only 39%¹² of participating undertakings completed the calculation. Feedback from supervisors indicated that small and medium-sized undertakings in particular omitted the calculation.

This lack of engagement with the method was accompanied by extensive feedback from industry, as well as from supervisors, on its shortcomings. Almost all countries reported complaints from their industries on the complexity and impracticability of the single equivalent scenario. In addition, there seem to have been issues with the stability of the approach. However, no authority elaborated on the latter any further than attributing it to general input sensitivity.

Complexity issues first and foremost included a lack of proper understanding of the method by the industry, but also covered a number of other concerns. The guidance given in the technical specifications on the single equivalent scenario was limited, as was the time the industry had at its disposal to complete QIS5.

¹² For the purposes of this statistic, undertakings for which the ratio of the adjustment for technical provisions with the equivalent scenario and the modular approach was between 99% and 101% (i.e. the results were identical or near identical) have been considered as not having completed the equivalent scenario calculation.

Undertakings completing the equivalent scenario reported that the complexity it added to the standard formula did not pay off in terms of deeper insight. Difficulties applying it to composite undertakings were particularly highlighted, since the model did not provide a method for consolidating different lines of business.

Since one of the key aims of introducing the methodology to the standard formula was to streamline the adjustments for future discretionary benefits (FDB) and deferred taxes, it is notable that a considerable number of reported issues relate to these adjustments. Countries elaborating on this reported that shortcuts were taken by the industry in the equivalent scenario calculation of the FDB adjustment (such as proportional reduction of the modular adjustment), to be able to complete the calculation within the given time frame.

In summary, it can be said that the single equivalent scenario approach was rejected by a large majority of participants and supervisory authorities, in most cases on the basis of the increase in the complexity of the standard formula, which was perceived as unjustified and overly burdensome. However, a couple of authorities nonetheless acknowledged the technical appropriateness of the method.

5.3. Loss absorbing capacity of technical provisions and deferred taxes

The reduction in the SCR coming from loss absorbing capacity stems from the undertaking's ability either to reduce payments of discretionary benefits (loss absorbing capacity of technical provisions) or to pay less tax than initially expected (loss absorbing capacity of deferred taxes) after an adverse event. More precisely, the loss absorbing capacity of technical provisions and deferred taxes captures the extent to which technical provisions and deferred tax liabilities would be reduced in the event of a shock.

Loss absorbency is extremely material to the total SCR, as set out in the charts in section 5.1. The table below shows a number of statistics on the calculation of loss absorbency. We can observe the loss absorbency calculated under both the equivalent scenario and the modular approach, and the amount of future discretionary benefits (FDB) consumed by the loss absorbing capacity of technical provisions under the equivalent scenario (ES), and the modular approach (MA).

At group level, the adjustment for the loss absorbing capacity of technical provisions allowed for an overall reduction of 28% of basic SCR and benefited about half of the participating groups.

The ratio of FDB to group SCR varied considerably between groups, due to the various different group structures since FDB only exists for life or health SLT contracts.

Proper assessment of the adjustment for the loss absorbing capacity of technical provisions was not easy at group level as any solo level constraints had to be assessed and dealt with carefully so as not to result in any undue compensation. Some participants (both groups and solo undertakings) reported difficulties with interpreting the FDB definition and with calculating the adjustment.

The adjustment for deferred taxes was on average 19% for groups. The calculation was again reported to be more complex at group level than at solo level, as groups often carry out business in more than one country and as a consequence deal with

different taxation regimes. Moreover, some fiscal regulation provides for the possibility of fiscal integration at group level. Furthermore at group level deferred taxes are an item that needs to be taken into account carefully when assessing availability of group own funds at group level (see group section).

Table 13: Comparison of the equivalent scenario and modular approaches

		10th	25th	50th	75th	90th	Weighted average	Standard Deviation	Sample Size
Equiv Scenario / Modular Approach		78%	100%	100%	100%	100%	90%	61%	1434
Equiv Scenario / Modular Approach - TP		85%	94%	100%	100%	128%	98%	62%	285
Equiv Scenario / Modular Approach - DT		100%	100%	100%	100%	100%	92%	17%	1340
Loss Capacity TP / FDB: ES	Absorbing	-92%	-74%	-44%	-20%	-14%	-43%	35%	290
Loss Capacity TP / FDB: MA	Absorbing	-85%	-63%	-35%	-18%	-7%	-42%	33%	506

The first three lines of the above table show the ratio of the adjustment calculated by the equivalent scenario, to the one calculated using the modular approach – for the total combined adjustment in the first line, and then for technical provisions and deferred taxes separately. This shows that on average the equivalent scenario gave a slightly smaller adjustment than the modular approach. However we note that for a large number of firms the equivalent scenario and modular approach results were exactly equal, suggesting that some undertakings may have given the modular approach result for both rather than undertaking the equivalent scenario calculation.

The bottom two lines of the table then show the calculated reduction in future discretionary benefits in the event of an adverse shock. For both the weighted average was a reduction of around 40%.

Only around 60% of the undertakings who took part in QIS5 calculated a loss absorbency adjustment, which may mean that the SCR is overstated for undertakings which did not perform the calculation. This, together with industries' and supervisors' calls for it, indicates a strong need for additional technical guidance.

One supervisor highlighted that undertakings had experienced serious difficulties and interpretation issues with the calculation of the loss-absorbing capacity of technical provisions and cited this as an area of major concern. A majority of countries reported experiencing difficulties with the methodology for calculating the adjustment for the loss absorbency of deferred taxes, calling for additional guidance in this area. Many reported that due to the lack of clarity around the methodology, a variety of approaches had been adopted by undertakings, or that some had not undertaken the calculation at all. Some supervisors suggested that this may have had a major impact on the results.

Some supervisors expressed a concern that qualitative assessment of whether deferred tax assets can be realised within a reasonable time frame has not been properly taken into account when assessing their loss absorbing capacity, and also raised concerns around the subjectivity of this decision. However, another supervisor strongly argued for full loss absorbency unless there is evidence in a given jurisdiction that this is not the case. Some supervisors reported on the other hand that their industry had adopted the QIS4 approach of capping the deferred tax adjustment at the value of existing deferred tax liabilities, mainly for reasons of practicability. In addition, in one country some undertakings struggled with the calculation of deferred

taxes as they knew the local tax regime was likely to change in response to Solvency II.

5.4. SCR Aggregation and operational risk

The aggregation methodology was generally well received, with no major or widespread complaints. A minority of undertakings were concerned that the correlation matrix approach would not adequately capture the effects of non-linearity and tail dependence. It was noted by supervisors that though there are a number of limitations to the SCR aggregation approach (see CP74), they still feel it appropriate for the purposes of the standard formula, and that its calibration is fitting for a 99.5 VaR measure.

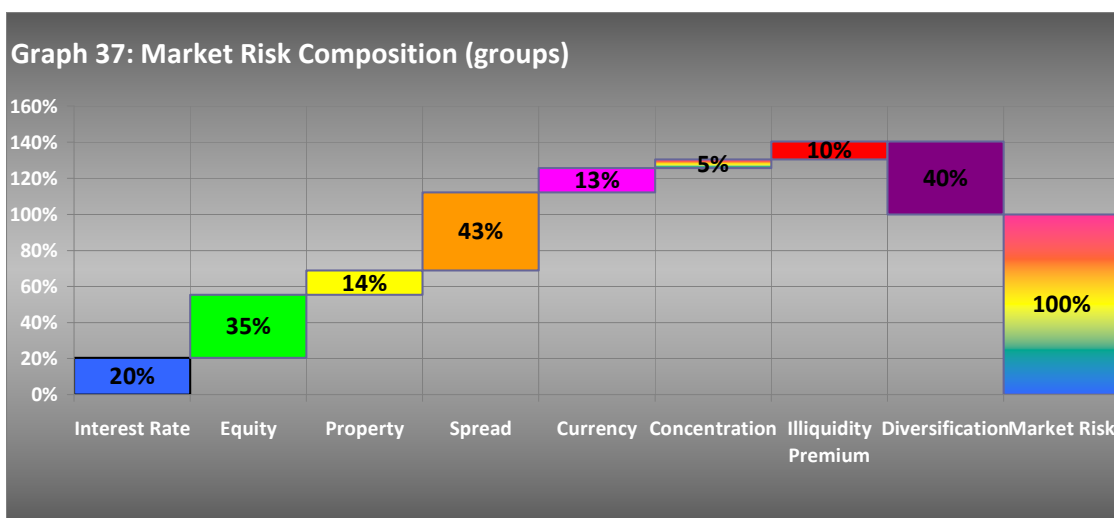
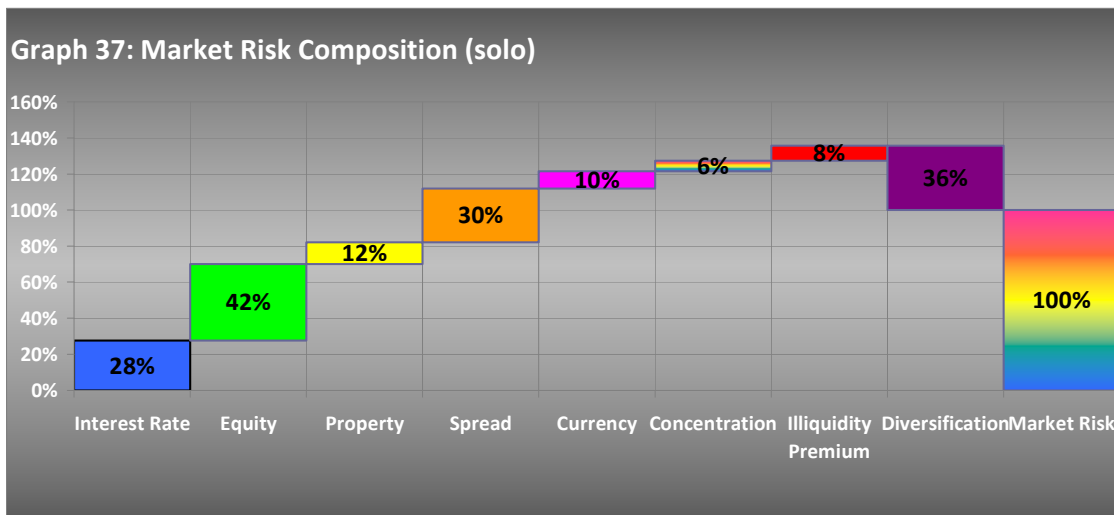
A few undertakings commented that the “tiered” aggregation structure was inappropriate. For example, the method is unable to accurately reflect the interactions between sub-modules belonging to separate risk modules (the method implicitly assumes the same correlation between equity and lapse as between equity and mortality), although again supervisors considered the application as it stands adequate. A minority of undertakings complained about the two-sided correlation matrix for market risk (for interest rate risk) since there would be increased complexity due to additional volatility of results over time. Only a few individual undertakings which provided internal model input made comments on parameters used in their correlation matrixes.

Qualitative feedback on operational risk was scarce and mainly focused on the method being too crude and not giving adequate incentives for good risk management practices. In this light it is surprising that most undertakings which plan to use partial internal models indicated an intention to use the standard formula methodology to assess their operational risk. Operational risk will often simply be added to the other risks without diversification, as in the standard formula. Groups also intended to use the standard formula for operational risk due to a lack of data and in the awareness that it lacks risk-sensitivity.

5.5. Market risk

5.5.1. General market risk

Market risk is the largest component of the standard formula SCR for the European industry. The equity, spread and interest rate components are the largest elements within this module, although the relative importance of the sub-modules varies widely by type of undertaking.



Perhaps the greatest area of comment on market risk was spread risk where comments were made around the calibration of the module, and issues around complexity for structured products and consistency of charge across different types of credit-risky assets (government bonds, corporate bonds, covered bonds and securitisations).

Following this were concerns about the application of the 'look-through' test for unit-linked business, and particularly where it would be appropriate to apply proportionality.

Almost all of the other sub-modules attracted some comments, which are described in more detail below.

As well as comments on specific sub-modules, there were some more general comments on market risk:

1. Undertakings and supervisors from a few countries felt that the absence of equity and interest rate volatility stresses was a significant omission from the standard formula resulting in perverse risk management incentives, although

the majority of supervisors did not raise this point. In most countries, volatility was one of the major additional risks included in internal models.

2. In addition to this there were comments on the lack of recognition for geographical diversification within an asset class and the fact that the ratings-based approach to certain risks penalised undertakings in lower-rated countries.

5.5.2. Look-through approach

A key issue related to market risk was the application of the look-through approach to unit-linked business. Many undertakings found this extremely time-consuming, and disproportionate to the (often second order) magnitude of the market risk related to unit-linked business. A number of supervisors noted that they are supportive of the principle of substance over form in general, but that guidance is needed in this case.

A significant number of countries saw scope for simplifications in the look-through approach used in the market risk module, particularly for investments in unit-linked funds. For more details refer to chapter 10 on practicability and preparedness. Others requested that the principle of proportionality be spelled out in clearer detail to understand when it is proportionate to apply the look-through approach.

Where structured products were discussed, there were some comments that whilst the look-through test is a desirable principle, it has been very hard to implement according to the technical specification for securitisations and undertakings have occasionally used ad hoc simplifications. One country explicitly requested simplifications for structured products.

5.5.3. Interest rate risk

In terms of the interest rate risk sub-module, two countries stated that its calibration proved to be penal for their industry, especially in view of its interplay with the current methodology to derive the interest rate term structure, which was considered inconsistent by one. A couple of countries regarded it as too complex and called for simplifications, in most cases based on durations (refer to chapter 10 on practicability and preparedness for further details). One supervisory authority also commented that basing the charge on the highest net interest rate risk led to inconsistencies with local regulations, and suggested using the highest overall SCR instead.

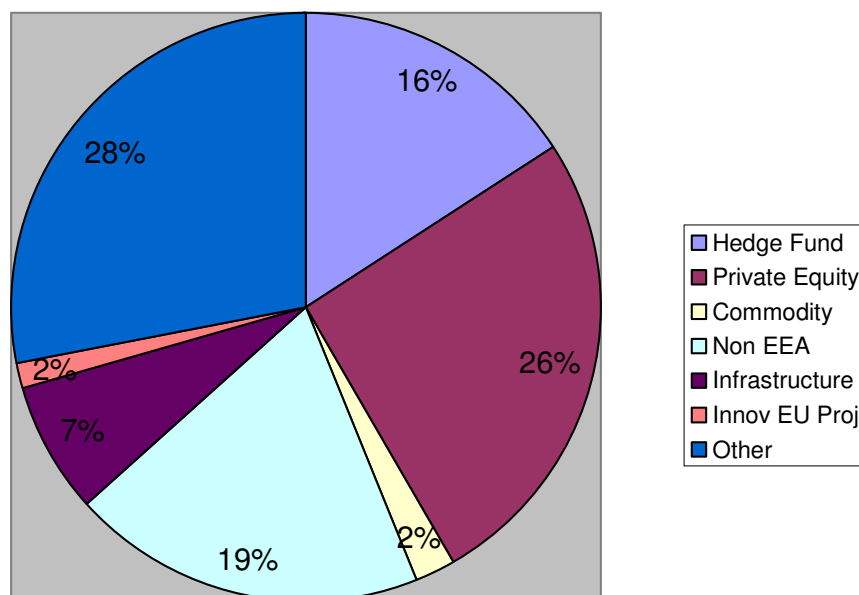
5.5.4. Equity risk

From two countries there was feedback that the equity risk sub-module was too penal for assets backing long-term liabilities, such as retirement insurance or third party liabilities insurance. Another country regarded the sub-module as over-calibrated overall and the same country commented that the 'other equity' charge for Plant and Equipment was excessive. Some commented on the lack of an equity volatility charge as a missing key component of the sub-module.

See section 5.12 for details of the equity risk charges applied to participations.

See below the composition of 'other equity' as reported in the qualitative questionnaire. The principle components are private equity and hedge fund exposures, as well as non-EEA exposures not covered by the principle categories. A large proportion is still classified as "other".

Graph 38: 'Other' Equity by category



5.5.5. Property risk

Property risk did not attract widespread comment. In some countries participants fed back that the property risk module was insufficiently granular, suggesting that location of property and type of use be taken into account. However in most of those cases their supervisors stated that they were reluctant to introduce further complexity to the standard formula by increasing the granularity of this module. In addition, in three countries there was feedback that the module was overly severe for the local market. Finally, it was suggested by one supervisor that the calibration was inappropriate for assets backing long-term liabilities.

5.5.6. Currency risk

Again there was little widespread comment on currency risk. In a couple of countries undertakings felt that currency risk was overestimated, and two noted a counterintuitive incentive to hold the reporting currency rather than the currency of underlying liabilities. Two countries with pegs to the Euro regarded the shock as too severe given their pegs.

5.5.7. Spread risk

The most commented on sub-module of market risk was spread risk, around which there were various concerns, falling into three broad areas: calibration, consistency and complexity.

On calibration, undertakings in two countries found the spread risk sub-module to have too high a calibration although one other country considered that the deviation from CEIOPS' advice has led to an overly low calibration. There were also comments that the sub-module was over-calibrated for structured credit (where in some cases capital charges were almost 100%) and local government bonds specifically.

On consistency, a few countries expressed the view that the non-inclusion of spread risk on EEA sovereign debt led to the omission of a risk and skewed incentives for undertakings. There were a couple of comments on the special treatment for covered bonds, with one country requesting that the special treatment be extended to AA bonds. Finally, one country commented that the duration floor of one year was inappropriate when applied to term deposits of lesser terms.

Apart from that, the complexity of the module is of concern for a couple of countries, particularly as it relates to structured products. Even the simplifications offered by the technical specifications are considered to be too complex by some. For further details on suggested simplifications please refer to section 10.5 (SCR simplifications).

Charts xSCR9-11 in the annex show the distribution by rating type of credit-risky assets held across the EEA industry, as reported in the Assets tab of the QIS5 spreadsheet. We note that the Assets tab was not particularly fully completed, and that this data therefore captures only a subset of the market.

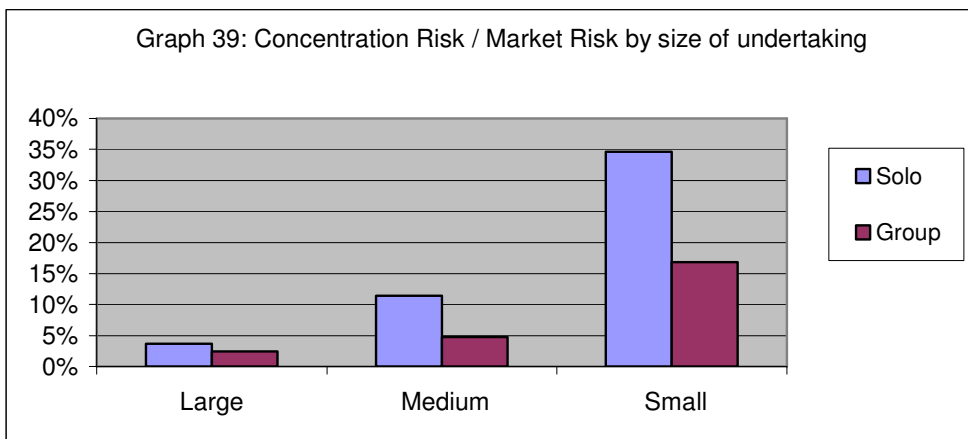
One supervisor noted that in their country the industry has significant exposure to residential mortgages. Therefore both industry and supervisor emphasised the need to include both exposure to residential mortgages and the risk-mitigating effect of the National Guarantee Scheme for residential mortgages in the spread risk or counterparty default risk module. Both would prefer a methodology in line with the Basel framework.

5.5.8. Concentration risk

Concentration risk was also commented on by few countries, with the impression being that the sub-module is broadly appropriate.

Another raised concerns around the impact of the sub-module for countries with fewer banks, and in particular fewer banks with higher ratings. The same country commented that the treatment of intra-group term deposits and intra-group investments in financial holding companies for concentration risk was inconsistent, and that Plant and Equipment should not be subject to this sub-module.

The below graph shows the pre-diversification proportion of market risk made up by concentration risk for small, medium and large undertakings. As we would expect this shows that concentration risk can be very material for the smaller undertakings.



5.5.9. Illiquidity premium risk

Some undertakings saw the illiquidity premium risk sub-module as inappropriate or unnecessary. One country noted that this shock only referred to the impact on the liability side of the balance sheet, neglecting the assets, and suggested that it be redesigned to take this into account and penalise undertakings with assets and liabilities ill-matched in illiquidity terms.

These comments have to be interpreted in light of the fact that the negative correlation of the illiquidity premium risk sub-module with the spread risk sub-module can be analytically shown to reduce the overall risk charge in the market risk module, whenever spread risk charge is bigger than the illiquidity premium risk. As shown in chapter 2, the marginal effect of the illiquidity premium in the SCR is quite limited (1.3%).

5.6. Counterparty Default Risk

The feedback from countries on the practicability of the implementation of counterparty default risk within the standard formula was quite unanimous. The calculations demanded by the module were widely perceived as being extremely laborious and complex, especially in view of the fact that the charge demanded for counterparty risk by the SCR standard formula is quite limited.

The main criticism with regard to complexity was directed at the determination of the risk-mitigating effect for type 1 exposures. In this respect, two major issues can be identified:

1. The determination of the risk-mitigating effect on single counterparty level is perceived as being disproportionately burdensome.
2. Practicability problems with the treatment of reinsurance in other parts of the standard formula emerge again in the counterparty default risk module when determining the risk-mitigating effect for a reinsurance counterparty. Problems were reported in relation to coinsurance pools, derivatives backing life obligations, reinsurance programmes including more than one counterparty, and non-proportional reinsurance such as stop-loss treaties.

In addition to that, complexity issues also arose from the cross-dependency of catastrophe and counterparty default risk, namely in the segmentation of formula SCR.6.29 per line of business, since the corresponding non-life CAT perils may not be

limited to one line of business and the technical specifications did not offer a method for the disaggregation of CAT charges. One country raised concerns that the combined structure of the CAT risk and counterparty default risk modules essentially assumed that reinsurers would default following a catastrophe event, which was unrealistic and unduly burdensome.

Many supervisors supported their industries' call for simplification of the module, some of them explicitly supporting the simplifications already offered by the technical specifications.

But even the simplifications offered by the QIS5 Technical Specifications were regarded as too complex by a number of participants. The entire setup of the module was regarded as disproportionately onerous relative to the nature, scale and complexity of this risk to undertakings' business. A considerable number of participants suggested simplifications (see section 10.5 on SCR simplifications).

A number of countries reported their industries' criticism of the treatment of unrated counterparties, which was perceived as being disproportionate. In this context, intragroup-transactions, counterparties with no rating but a positive experience of past transactions, premium debtors, and hospitals were mentioned. Also, the risk charge for type 2 exposures was perceived as being disproportionate compared to type 1 by undertakings in a number of countries. In this context, the 3 month limit for past-due exposures was also mentioned as being judged as too restrictive for certain transactions (e.g. receivables for intermediaries). Also, differentiation towards the risk horizon of derivatives was called for, as well as discrimination between OTC- and ETD-derivatives. Some countries reported the lack of ratings for counterparties in the domestic market as being an issue.

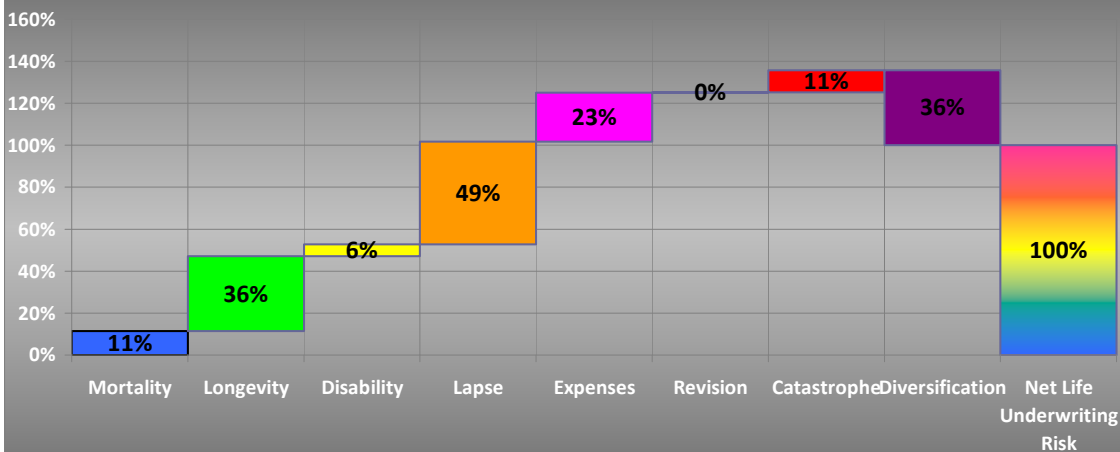
In addition to that, a couple of consistency issues with regard to the risk charge for cash at bank were indicated:

- Undertakings reported the risk charge for cash at bank in the counterparty module to be significantly higher than the charge for a bond issued by the same bank in the spread risk module.
- The same holds true for cash at bank in comparison to long-term deposits, which according to the Q&A were attributed to the spread risk module. In this context, guidance on the distinction between cash at bank and bank deposits was also called for.
- In contrast to reinsurance contracts and derivatives, the loss given default (LGD) for cash at bank bears no recovery rate in the counterparty module.

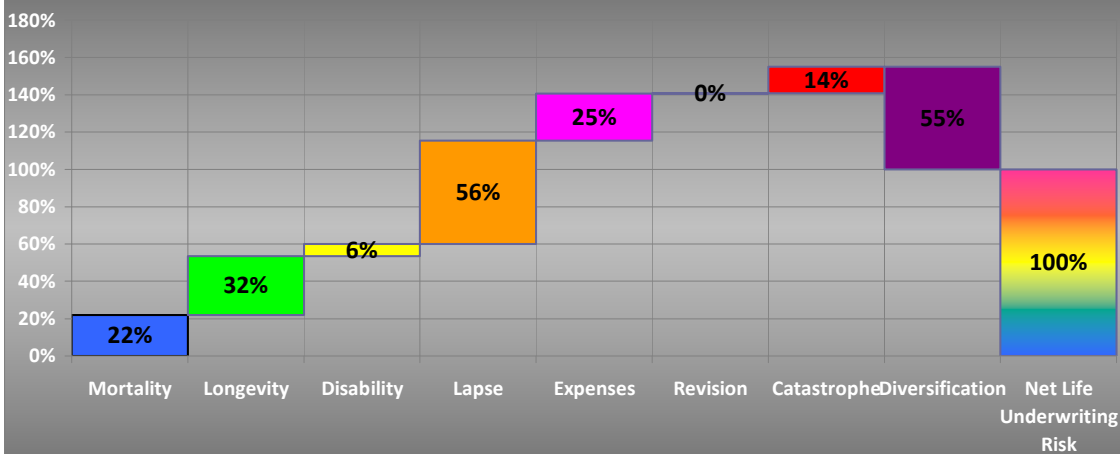
5.7. Life Underwriting risk

Life underwriting risk is the second most material module for life undertakings behind market risk. Within this lapse risk and longevity risk are the two most material sub-modules.

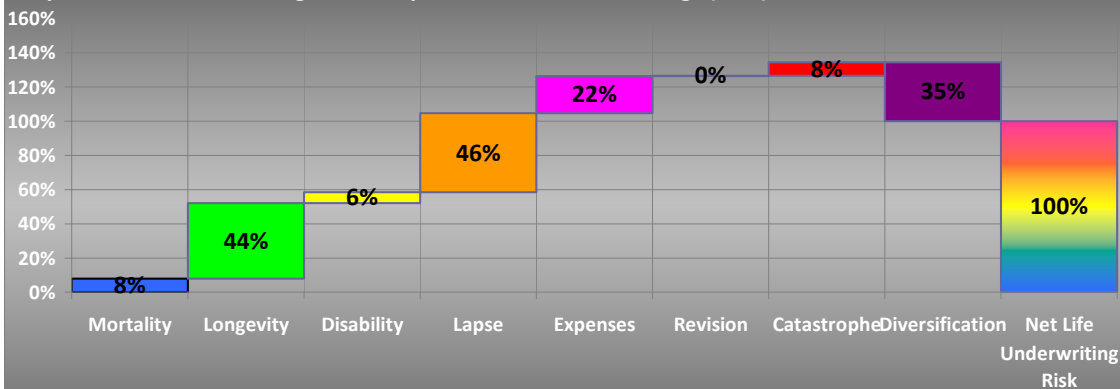
Graph 40: Life Underwriting Risk Composition - All undertakings (solo)



Graph 40: Life Underwriting Risk Composition - All undertakings (groups)



Graph 41: Life Underwriting Risk Composition - Life undertakings (solo)



Life underwriting risk has been generally well received, and the impression is of a module that most of the industry is content with. The only major exception to this is lapse risk, where there were concerns by many on the requirement to calculate lapse on a policy-by-policy rather than model point basis.

5.7.1. Lapse risk

The key practical criticism was the need to calculate lapses on a policy-by-policy basis: a large number of undertakings raised this as an area in need of simplification, and generally they were supported by their supervisors. Criticisms were that this was too onerous in terms of calculation time (especially for complex or stochastic models) and that new systems will have to be developed at significant cost. In some cases ad hoc simplifications were performed, or model points were used.

There were also criticisms from undertakings and some supervisors of the policy-by-policy approach on more theoretical grounds, with some suggesting that the treatment of surrender strain should not be asymmetric and should be by broad segment to better reflect lack of policyholder rationality. A minority of countries noted that the asymmetric treatment is appropriate, and some that policy-by-policy modelling is appropriate for certain types of products, although mentioning that proportionality should apply.

Some said that taking the maximum of the three shocks was insufficient, and that a more subtle approach should be applied, and some questioned the dividing line between wholesale and retail business, usually because it caught the wrong business (rather than due to the concept of the division itself). A number found segmentation by surrender strain type very difficult.

There were some other practical considerations raised by one or two countries, with one reporting that the calculation of lapse effects on options proved challenging. Another remarked that understanding the direction of the surrender strain of a policy was tricky and that the module could be simplified by omitting this distinction. Some requested that lapse penalties be taken into account more explicitly as without this the current approach may give the wrong 'biting' lapse stress. There were inconsistencies noted with applying the lapse to guaranteed annuity options, and further guidance was requested, with one undertaking requesting that the decrease in election/take up rates be stressed, and some noting that clarification on the timing of the surrender should be given.

5.7.2. Concerns in other sub-modules

The principle area of comment other than lapse risk was longevity, and the mortality risk sub-module also attracted a few items of feedback: further details can be found below. However neither is considered a major area of discrepancy or difficulty. There were various comments that particular modules were over-calibrated; however, in each case this was only from a small minority of respondents.

Undertakings in some countries found policy-by-policy calculation onerous for the other areas of life underwriting as well as lapse risk. A few countries encountered difficulties with the unbundling of the different risks, and some others had data availability problems. There were also a couple of comments that diversification benefits should be allowed.

Longevity risk

There was feedback from a number of countries that as the current shock was only a shock on the level, it failed to adequately take into account trend risk: undertakings felt a stress on the future improvement rates would be more appropriate. However opinion among their supervisors was mixed: some agreed that this shock would be more appropriate, but there were also concerns that this would introduce further complexity to the standard formula.

Additionally, one country suggested that the positive correlation between lapse and longevity risks was inappropriate for annuities business.

Mortality risk

One country suggested that the classification of policies between mortality and longevity should be done based on the stress scenario rather than the base scenario, as they might show different characteristics in the stress situation. A couple of others suggested that more compensation should be allowed for mortality and longevity policies in the same sub-segment.

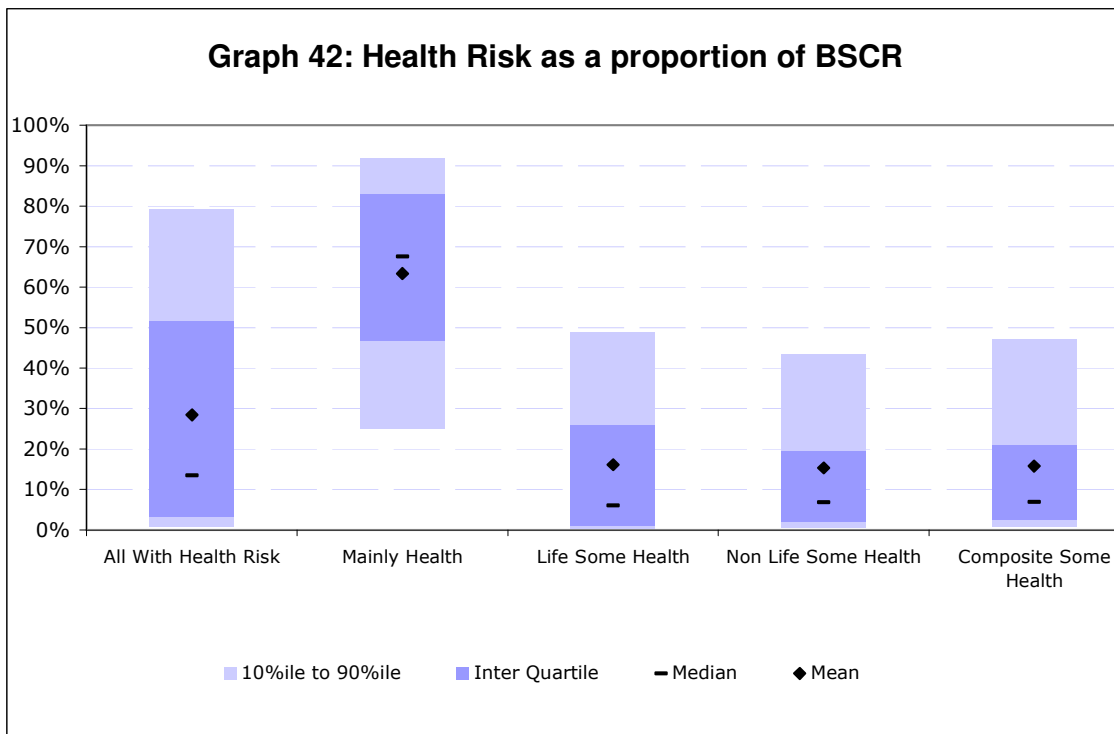
5.8. Health underwriting risk

The health underwriting risk module had been subject to a complete overhaul since QIS4, and hence attracted a considerable number of comments. Key areas of concern were segmentation, the disability/morbidity sub-module, lapse risk, and catastrophe risk.

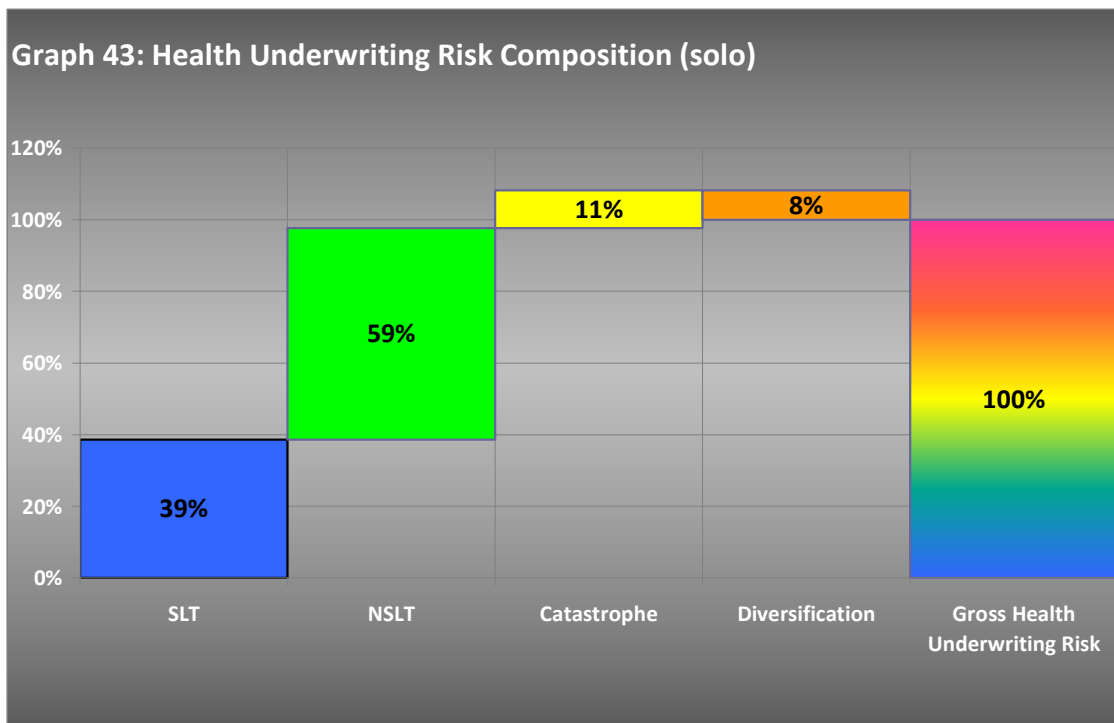
Many countries reported that their industries had problems properly segmenting their health business into SLT (Similar to Life Techniques) and non-SLT (Not Similar to Life Techniques) lines. One area especially mentioned in this context was workers' compensation. In addition to that, two countries reported problems with unbundling income protection and medical expenses.

Data analysis reveals that for undertakings primarily writing health business health underwriting risk constitutes a major part of the overall capital requirement, the proportion of net health capital requirement to BSCR averaging 63% (see graph 42¹³ below). Hence, even though health underwriting contributes only 4.3% to the overall EEA SCR (see graph 33 in section 5.1), it is of major importance for the 382 health undertakings which participated.

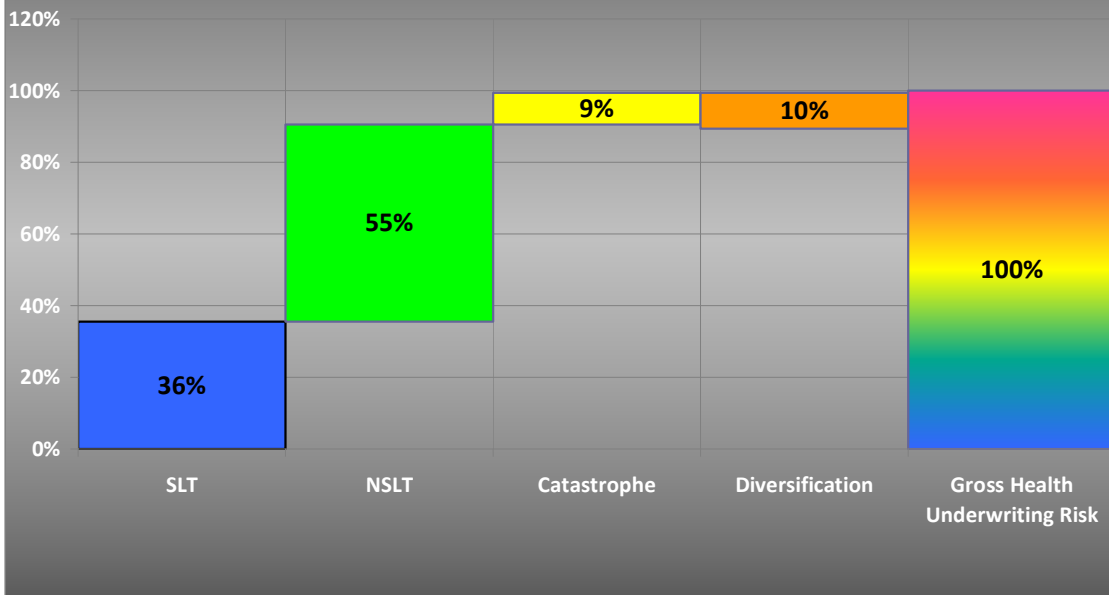
¹³ In graph 42, "mainly health" refers to undertakings classified as "health undertakings" for the purposes of QIS5 (e.g. having more than 80% of technical provisions made up by health lines of business), while the remaining categories relate to other undertakings which had health liabilities, but for whom it was less than 80% of their business.



The largest portion of the risk charge for health underwriting in the EEA relates to the non-SLT health underwriting risk module.



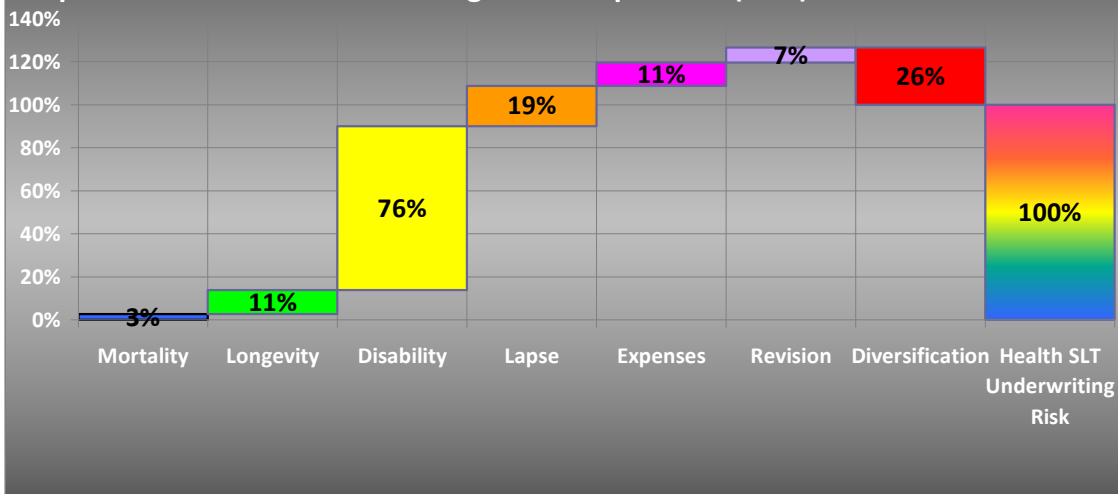
Graph 43: Health Underwriting Risk Composition (groups)

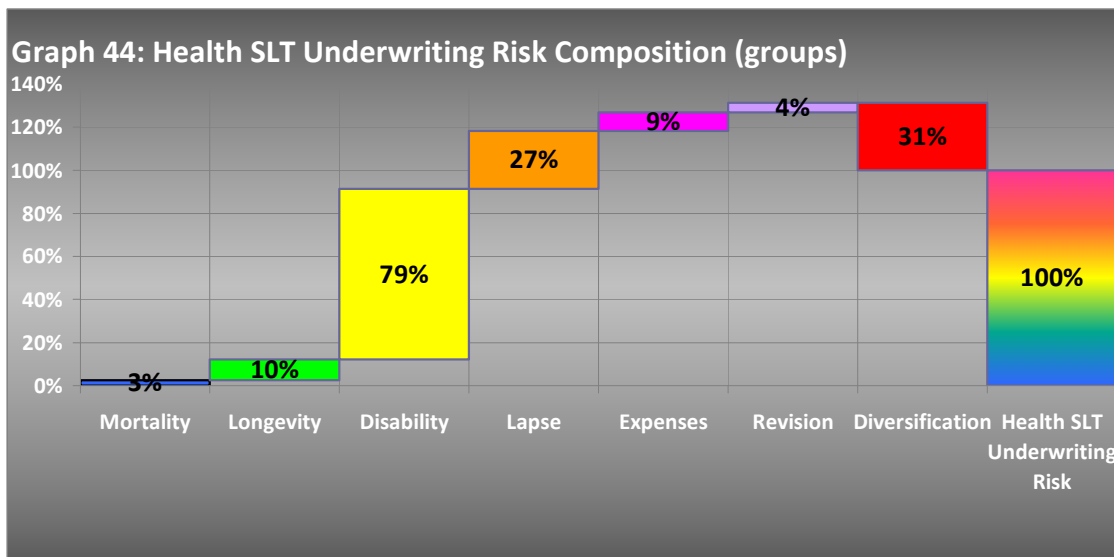


5.8.1. Health SLT

Feedback on health SLT concentrated on the two sub-modules contributing the most to the risk charge, namely the disability/morbidity (76%) and lapse risk (19%) sub-modules.

Graph 44: Health SLT Underwriting Risk Composition (solo)





On the mortality and longevity sub-modules only one country volunteered comments, asking for a reduction in the complexity of the approach in countries where selection by individual life expectancy does not take place and suggesting a portfolio approach. The revision risk sub-module also received few comments, with one country flagging the inconsistency of applying different shocks to annuities stemming from health and non-life.

Disability/morbidity risk is the heavyweight of the health SLT underwriting risk module, contributing 76% of the risk charge before diversification. A number of countries reported that their industry regarded the shocks for income protection in the disability/morbidity sub-module as too severe. One country also reported technical issues with the calculation, indicating that its health SLT business is not based on disability/morbidity rates and hence the shocks could not be meaningfully applied, with the industry using proxy solutions instead. This country also indicated that the one-sided stresses are counterintuitive for premium adjustment business with profit participation, since the safety loading included in the premiums may technically lead to profits in the long run and to a risk charge of nil.

On health SLT Lapse, complexity as well as consistency issues can be identified. Regarding complexity, it seems to be difficult for the industry to identify the positive and negative surrender strains required by the module, and the disaggregation of model points to policy level is also reported as problematic. Regarding consistency, some countries expressed concerns about the fact that the lapse calibration varies between the health SLT underwriting and life underwriting sub-modules, commenting that the relevant contracts may be very similar or that contracts may combine life and health components. However, one supervisor explicitly supported the distinction, since SLT health lapse is subject to considerable legal constraints in its market.

5.8.2. Non-SLT health

Comments on non-SLT health focused mainly on the lapse sub-module, and indicated that the industry in some countries regarded it as immaterial and hence many undertakings did not calculate it. Countries did not give much feedback on premium and reserve risk. Two supervisors remarked on difficulties with taking more than one non-proportional reinsurance treaty into account properly.

5.8.3. Health equalisation systems

The volatility parameter for health underwriting risk allows for the risk-mitigating effect of a health risk equalisation system. With the introduction of a HRES-parameter the volatility parameter can be adjusted, up to an upper level of 50% of the Europe-wide calibration.

One supervisor indicated that in QIS5 the health insurers' risk was better represented than in previous exercises as the methodology of a health risk equalisation system (HRES) has now been better accounted for.

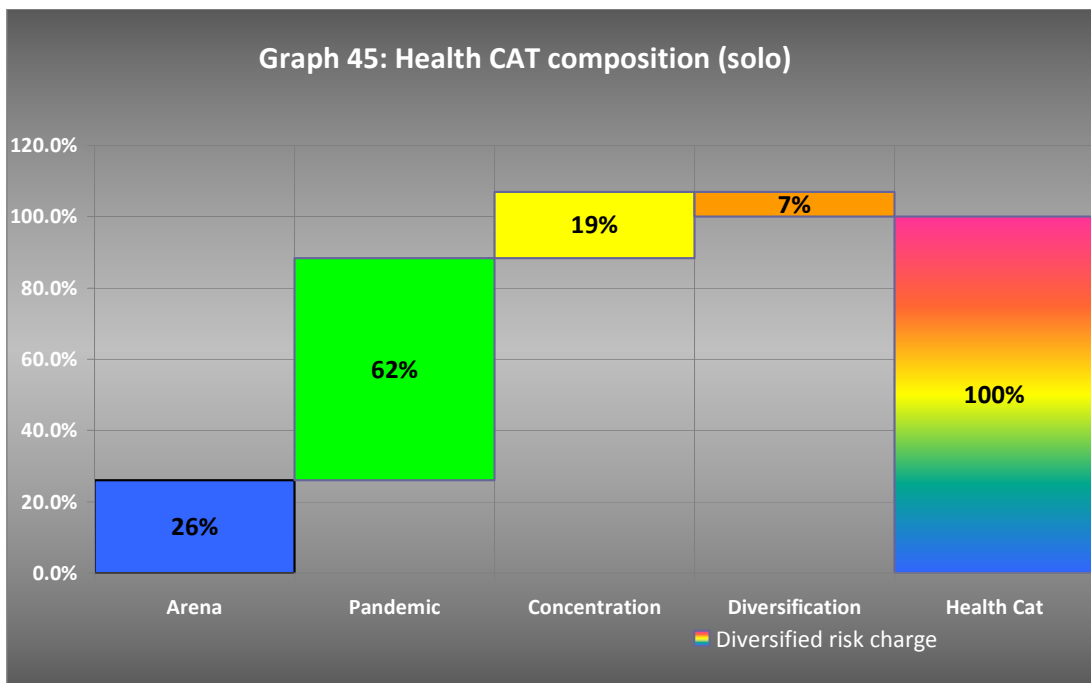
The health insurers of this country applied a parameter adjusted by the full 50%. This meant an increase in the volatility level, as even with the cap this meant a doubling of the prescribed volatility in comparison with QIS4.

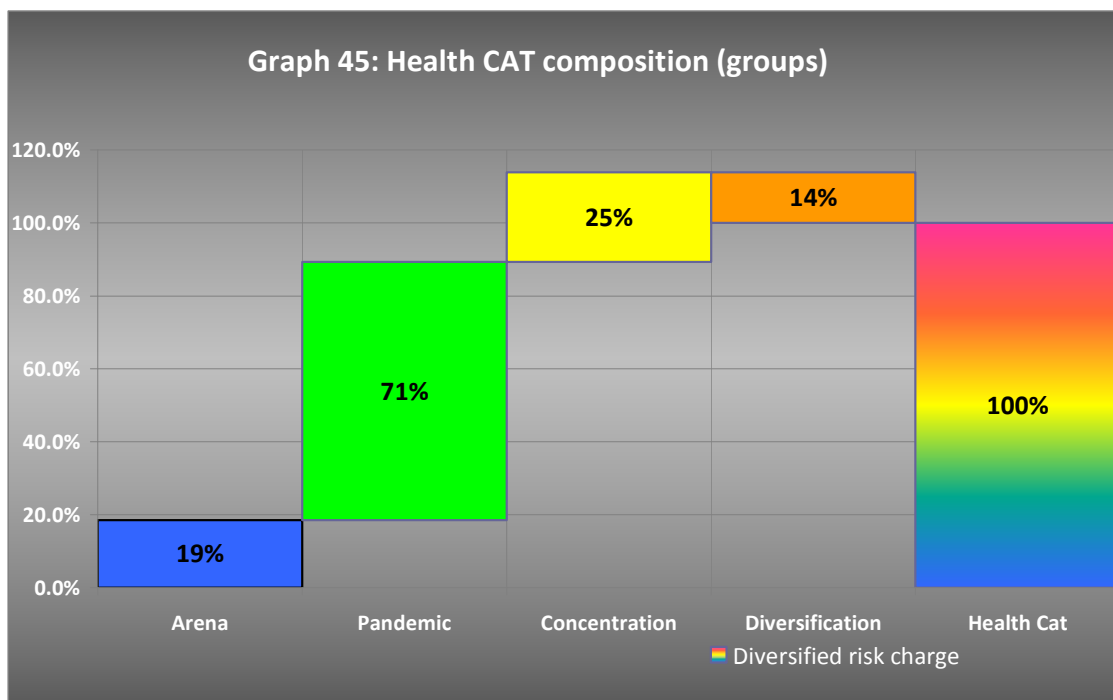
Health undertakings reported that the inclusion of the HRES methodology better reflected their underlying risks. However they also expressed concerns about the calibration of the HRES-parameter.

The supervisor also indicated that health insurers' risk was better represented with the inclusion of the HRES in the framework. They advise that use of the HRES-parameter should be facilitated in situations where the risk equalisation system is still developing.

The ongoing recalibration of the HRES parameter by the Joint Working Group for the calibration of non-life and health underwriting risk factors may lead to additional insights.

5.8.4. Health catastrophe risk sub-module





The main comments on health catastrophe risk focused on the appropriateness of the scenarios to the local market and individual insurers. Hence, this risk module was regarded as too severe for some undertakings and to be ignorant of certain risk events for others. Some examples mentioned by countries:

- no account is taken of medical expenses, which is an important risk driver in case of pandemic;
- if a country has a singular large stadium it has a significant impact; the average size of a country's stadia rather than the largest stadium should be considered;
- the assumption that all three scenarios will take place in the next year is unrealistic, only the most appropriate should be considered; and
- the capital-at-risk is considered more than once in calculating the capital charge for accidental death, medical expenses, and short-term disability.

Two countries suggested there was double-counting, for example saying that pandemic scenarios are implicitly included in the disability/morbidity sub-module or that the arena scenario overlaps with the concentration scenario.

There were also a number of comments that the health catastrophe sub-module was excessively complex and that data requirements were hard to meet; in particular a significant number of countries remarked that total insured lives was unavailable for certain areas.

Two countries questioned the appropriateness of the scenarios in light of the role played by the public health-care system in a catastrophe situation. The health CAT risk was criticised by undertakings in a few countries because the concentration scenario did not allow for different numbers of policyholders for different products, was arbitrary and could lead to an unlevel playing field. It was also emphasised that there is an inconsistency between the CAT modules for health and life, as also pointed out by the CAT Task Force.

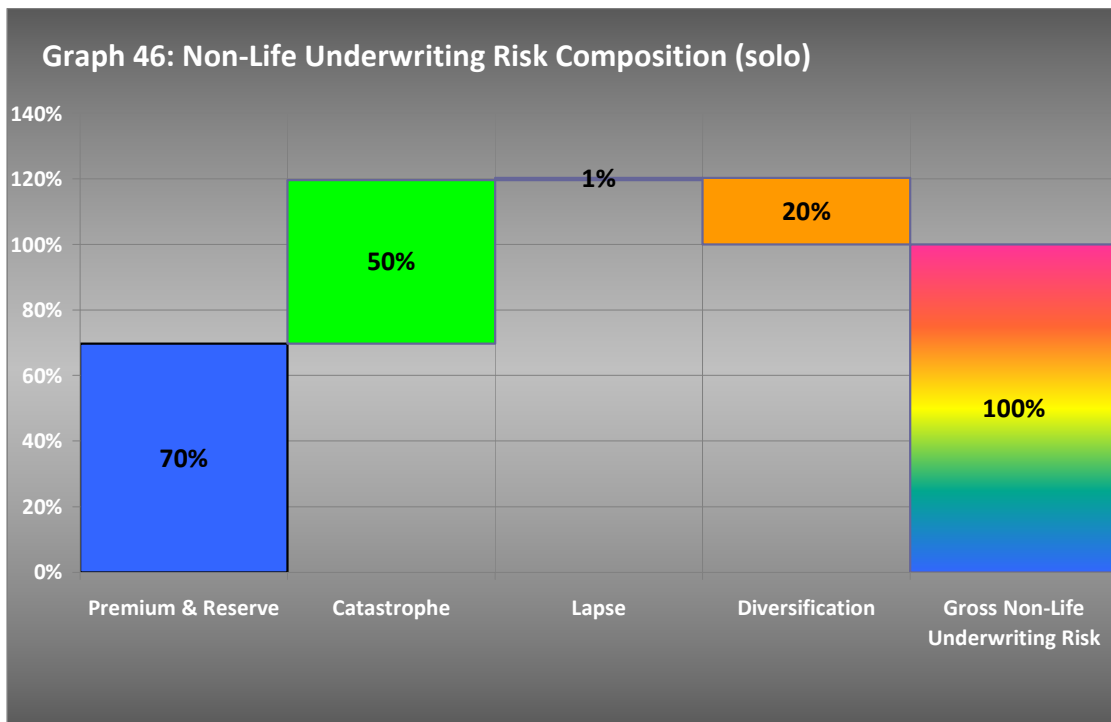
5.9. Non-life Underwriting risk

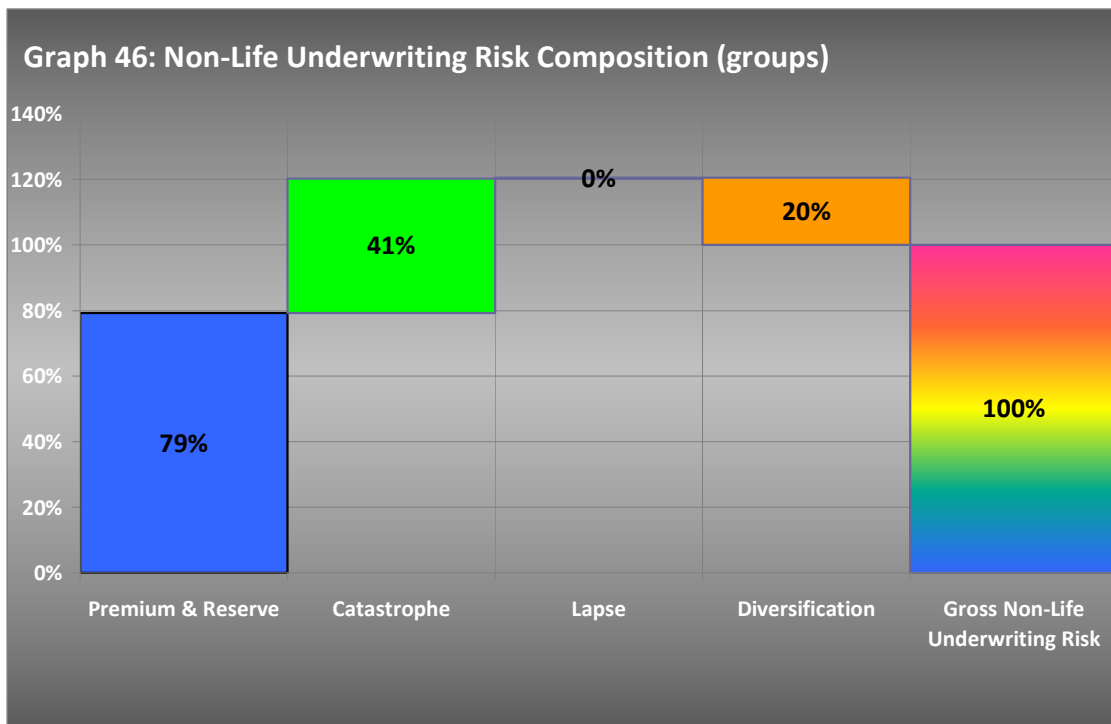
The non-life underwriting risk module received a lot of criticism regarding complexity from participants. Very little of this was around premium and reserve risk, however, with the catastrophe risk sub-module clearly topping the overall list of complaints. In addition, the lapse risk sub-module was perceived as being immaterial by a large proportion of participants, and hence the effort involved in calculating the stress was judged by many to be superfluous.

In addition to that, there was some feedback from undertakings that while the introduction of future premiums and contract boundaries made sense from a theoretical point of view, the difficulties encountered in calculating them outweighed the benefits.

A few countries reported that the correlations were regarded as inaccurate, but did not identify any specific problem areas. There were also one or two comments that the basis of the calibrations in historical data could lead to them being inappropriate.

Undertakings in a couple of countries encountered difficulties with the allocation into lines of business (LoBs), and undertakings in a few countries would welcome additional guidance on the definitions of written and earned premiums.





5.9.1. Premium and reserve risk

There were not many comments on the premium and reserve risk sub-module. One concern raised by undertakings in some countries was around the volume measure used, as it included commission and hence resulted in a higher risk charge for more profitable business. There was also feedback from a couple of countries that it was difficult to omit catastrophes from historical data for the purposes of this sub-module, but most did not report any difficulties.

There were some comments that geographical diversification was not accurately reflected, but no clear common view on the precise problem: a couple of countries suggested that the 25% limit was too low for some insurers, and another that there should be a single European region. One supervisor noted that the calculation could be difficult for reinsurers, as data was not always available.

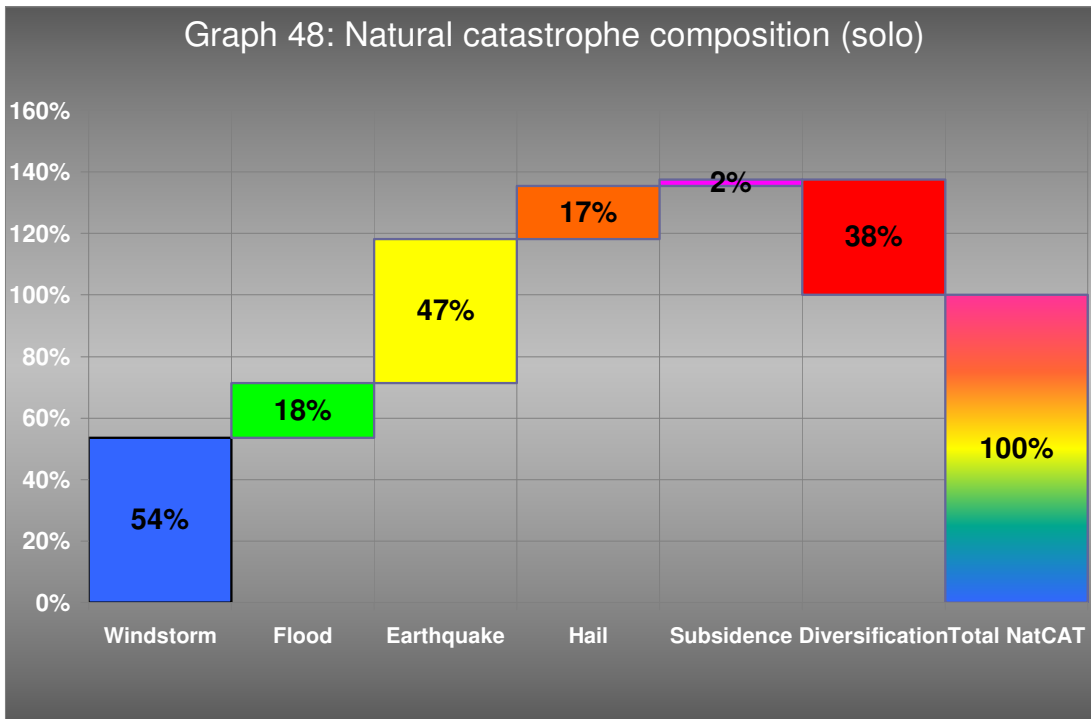
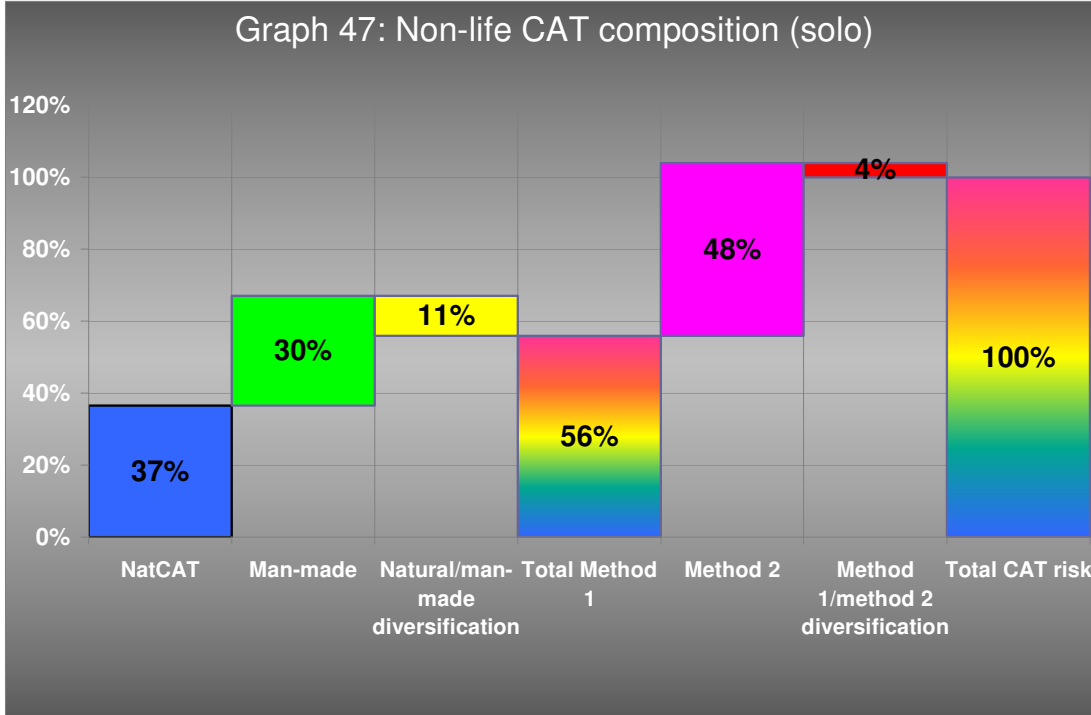
5.9.2. Lapse risk

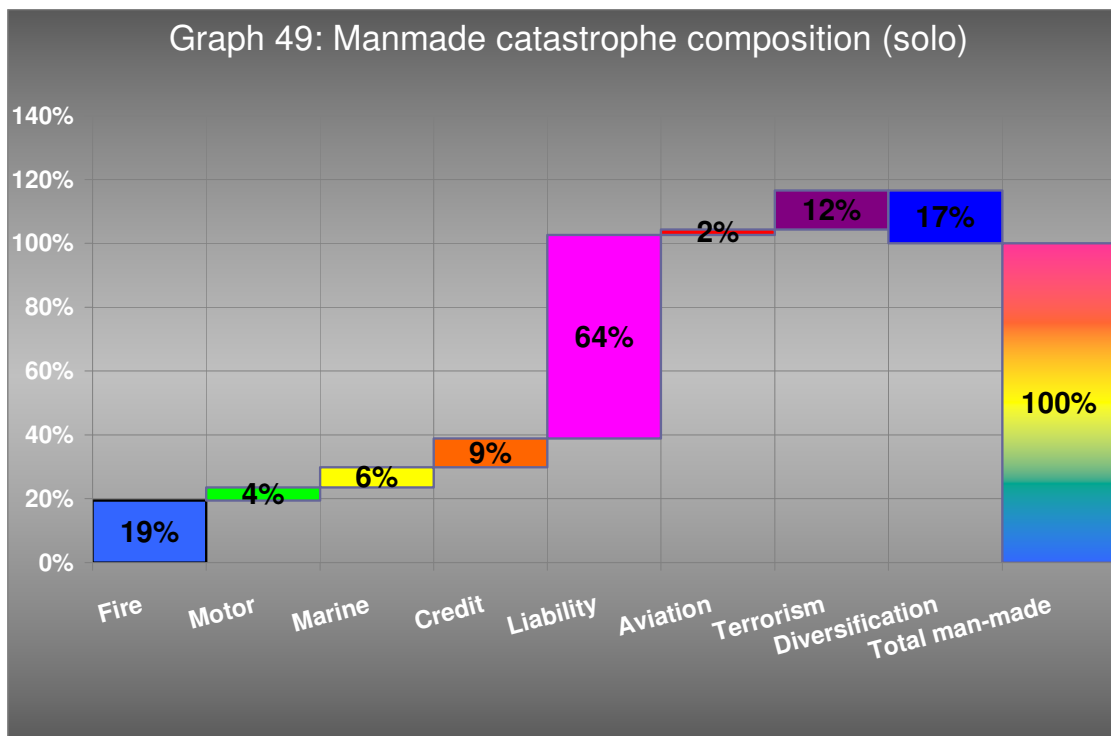
Most countries reported that this sub-module was found to be immaterial or irrelevant by non-life undertakings, and in some countries undertakings had omitted the calculation entirely. The link with the definition of contract boundaries should also be highlighted; if these were very widely defined, the risk could become more material. A number of countries commented that the complexity of the calculation had been seen as unjustified in comparison with the sub-module's materiality. Difficulties in calculation or in sourcing data were not reported by a significant number of countries, but it should be borne in mind that in some other countries undertakings had not carried out the calculation at all.

Beyond that, there was some feedback along similar lines to the corresponding life sub-module: that the policy-by-policy approach was challenging, and that the policyholder rationality assumed was unreasonable.

A couple of countries also reported that for reinsurers it was unclear whether the lapse referred to the reinsurance policies, or the underlying primary insurance policies. In the latter case it was noted that data might not be available.

5.9.3. Catastrophe risk





The above graphs show the split between method 1 (scenario-based) and method 2 (factor-based) at EEA level, as well as the split between natural catastrophe and man-made catastrophe. We can also see that at EEA level the principal components of natural catastrophe risk were windstorm and earthquake, and that by far the largest component of man-made catastrophe was liability, followed by fire and terrorism.

It should be noted that CAT risk, by its very nature, varies substantially between different regions, in both its size and its composition – graph xSCR14 in the annex show the breakdown of natural and man-made catastrophe risk charges by countries. Nonetheless, feedback on the sub-module was quite unanimous, with only some differences based on the characteristics of different countries.

This sub-module attracted a very large number of comments and complaints from the non-life industry across Europe. The feedback can for the most part be classified into four major areas: 1) calibration and methods used, 2) applicability to the respective line of business or regional market, 3) data availability, and 4) effort needed to calculate the required capital.

The applicability of the standardised scenarios was often questioned and it was reported that for some (specialist) insurers the scenarios were not appropriate for their business, resulting in both under-estimation and overestimation of risk for different undertakings. Some undertakings suggested that use of personalised scenarios or USPs might resolve this.

Methodology and calibration

Many concerns were raised around the man-made scenario methodology. The natural catastrophe (NatCAT) approach was generally questioned in the areas of calibration and data availability.

A considerable concern was that the CRESTA factors for NatCAT did not adequately reflect the actual risk undertaken by the respective insurance or reinsurance undertaking. Only one country mentioned that zones are not matched with national data records. In another country only a couple of the participating undertakings applied the approach based on CRESTA zones. Confusion was also experienced in some countries where there were no pre-defined natural catastrophe scenarios, as to how the sub-module should be approached in their absence; in particular, when undertakings couldn't use method 1 for NatCAT but could for man-made CAT risk, they reported queries around how to use method 2. A few participants mentioned that NatCAT scenarios are not applicable to the transport line of business.

Although feedback on the calibration of the catastrophe scenarios tended to vary between countries, a few trends could be identified: several respondents reported that the windstorm scenario was too severe (though another found it too weak), some central European countries found the flood calibration too high and for example in one country mentioned that measures taken since the most recent severe floods have not been taken into account. The earthquake and hail perils were both reported to be too highly calibrated by one country. One country presented an alternative calibration as an annex to its report. Some countries questioned the appropriateness of the natural perils defined for them. There were also comments that the module was over-calibrated for P&I clubs and represented a 99.5% VaR over one year for the P&I industry as a whole rather than single members.

Some participants also indicated that country-specific risk mitigation tools/effects should be explicitly taken into account. Some suggested that the possible maximum loss (PML) should be used as a volume measure instead of total sum insured.

One undertaking noted that the NatCAT risk factors are applied to all property exposures, including geographical locations that are not exposed to certain types of CAT risk, leading to the CAT risk under QIS5 being overstated for this class of business.

A significant number of countries raised concerns that the CAT scenarios were not suitable for credit insurance and surety business: almost all suggested that it was too severe, although one country felt that it was probably too low for surety business. Participants raised concerns that the scenario involving the failure of their three main exposures was of a lesser probability than 1 in 200, suggesting that it failed to take into account undertakings' active management of their large exposures, as well as the credit rating of the insured. There was also feedback that the recession scenario was double-counting with the tail of premium and reserve risk. Some undertakings lacked sufficient years of observations with which to determine the failure rate and therefore some used method 2 which for one country seemed to give a much lower result. Undertakings in one country stated that it was not clear whether the credit scenario was applicable only to credit insurance or to suretyship insurance as well. Moreover, there were no method 2 parameters for suretyship business. One country suggested that group exposure in SCR 9.146a) should be defined as exposure to single financial/capital group as some undertakings assumed that it referred to a group of policies in the same product.

Another area that triggered considerable feedback was liability insurance and its treatment. A number of countries suggested that the CAT results for it were overly severe. It was particularly highlighted that the requirements were not well specified, for example there was no information on the number and magnitude of claims making up the gross loss, making it difficult to adjust for reinsurance. The specified scenarios

were also found not to be appropriate for all undertakings. The required sub-division of premiums into the lines of business specified in the technical specifications was considered not to be appropriate and there were concerns that the sub-module failed to take into account contract limits.

One country stated that both methods provided unlikely results for medical malpractice (defined as Third Party General Liability in the QIS5 Technical Specifications) and that a more granular approach was needed. Another country indicated that construction risk was not correctly captured as the volume measure, total sum insured, did not represent the potential loss within the year, but the potential loss when the construction is finalised.

There was also feedback from a number of countries that the marine scenario was not suitable for their undertakings: for example, it was difficult for a small insurance undertaking to have any insight into the costs associated with a ship's collision with an oil-drilling platform and the costs of stemming the oil flow from burst pipes. Where undertakings did not insure either oil tankers or cruise ships, as was often the case in some countries, they were forced to use method 2 which had a very high impact on SCR. One country fed back that they regarded the marine scenarios in general as particularly severe. P&I clubs reported that there were similarities between the standardised scenarios for marine business and their internally elaborated scenarios.

The motor sub-module was found by a few countries to be under-calibrated, unrealistic or difficult to follow. The definition of input data was unclear, especially vehicle years. One undertaking referred to an inconsistency in the motor CAT risk scenario as motor property damage exposure is not required to be input for windstorm whilst the factor method applies a charge of 175% premium.

For the fire sub-module, a number of undertakings (especially captives) in one country used Option 2 for the fire scenario as they felt that Option 1 did not reflect the maximum loss that could be made. In these cases, the maximum loss was the policy limit and not the largest total insured value ("TIV"). A 100% loss was not believed to be a likely scenario. One undertaking also encountered problems with separating industrial from commercial business for Option 2 and with estimating the largest concentration of buildings. One country noted that the fire peril risk description concerns business interruption as well as property damage, but that the input value is sum insured under the Fire and other damage line of business only (and not liability or financial loss). There were suggestions that estimated maximum loss should be used instead of total sum insured.

Undertakings from one country indicated that it was not clear whether the terrorism scenario applied only to officially announced terror acts or to unproven events as well, and whether undertakings needed to calculate the capital requirement for terrorism even if this peril was excluded from all their insurance contracts. One country expressed concerns about the need to make expert judgements for specific terrorism and pirate scenarios, and another mentioned the difficulty of taking into account contract specificities. The terrorism scenario was described by one country as unrealistic.

One country mentioned practical difficulties in calculating the aviation scenario. Another country encountered problems with data in this sub-module, while finding that using method 2 gave a low capital requirement compared to the risk.

One country mentioned that the highest risk/exposure should be chosen based on the net of reinsurance value (not the gross of reinsurance value) as, if gross values were to be taken as the input, insurance undertaking could buy facultative deep reinsurance for the highest gross of reinsurance risk exposure, lowering the SCR capital charge after taking into account risk mitigation even if the undertaking was still exposed to a high risk net of reinsurance through other exposures.

In five countries, undertakings queried the lack of an allowance for a limitation on the ceded risks when providing insured values for the purposes of CAT risk calculations. Undertakings also commented that there was a certain amount of double-counting within the man-made scenarios, as a number of scenarios resulted in policy limit losses, which can obviously only be breached once. In some cases, undertakings noted that they used the policy limits as the maximum loss rather than the underlying exposure information.

For method 2, there was feedback that it was not risk-sensitive or was often very penal. Criticism was expressed that the method was neither well-defined (e.g. premium split) nor an adequate reflection of risk.

One country indicated that particularly in the miscellaneous line of business, the single factor may prove to be inappropriate in many cases. Moreover some products in the Miscellaneous line of business, such as Extended Warranty business, had characteristics that were very similar to Assistance business but Assistance business had no catastrophe charge in the standard formula.

It was also a concern that there was no allowance for geographical diversification in this method. It was suggested that the severity of method 2 created difficulties for insurers with non-EEA exposures where method 1 could not be used. The large discrepancy between the method 1 and method 2 results was also a concern raised by a number of countries.

One country felt it was not clearly stated in the technical specifications whether the method 2 factors should be applied to all premiums or just to those linked to catastrophe risk. Undertakings in a few countries suggested that the use of total premium for more than one peril was double-counting, and some proposed that the premium should instead be allocated between the different perils (although others indicated that if this was required, there were likely to be problems with data availability).

It was suggested by participants that insurers could calculate their own gross aggregate exposure at the 1 in 200 level (as part of their risk management system) and use this information in the standard formula for catastrophe risk. To validate insurers' work, supervisors could compare insurers' estimates against a measure of exposure and investigate outliers.

One country indicated that the CAT risk sub-module did not fit workers' compensation insurance.

Finally, some undertakings suggested that there is an overlap between the CAT risk capital requirement and binary events already taken into account in technical provisions.

Data availability

Almost all countries observed problems with data availability to a greater or lesser extent, especially in the man-made scenarios for example number of insured buildings in a 150/300 metre radius, availability of postal code for the insured object (e.g. buildings under construction, large cranes or technical equipment), for those insurance contracts where the whole production of a given calendar year is insured, and for the terrorism sub-module. This forced participants to use the factor-based method 2, whose calibration was found to be excessively prudent. Two countries indicated problems with allocation to zones for multi-location policies and one country with segmentation of individual contracts into CRESTA zones for group policies. In some countries, total insured value ("TIV") was not available for all CRESTA zones, especially for small undertakings. In other cases, the TIV was not available by CRESTA zone, only in total. Two countries mentioned difficulties with reliably removing catastrophe losses from historic data creating a significant risk of double-counting with the premium and reserve risk sub-module. In some cases participants suggested using probable maximum loss instead of total insured value.

Reinsurance issues

A number of countries also commented that the sub-module was not appropriate for reinsurers, especially the man-made scenarios. The participants had problems with identifying the precise location of all large risks and the share of total sum insured. Usually the coinsurance structure of large risks is not known, and the reinsurance client does not provide limit profiles on an original total sum insured basis. Furthermore, in contrast to NatCAT perils, a standardised concept for geo-coding large risks potentially exposed to man-made CAT scenarios does not exist. Additional information on loss history, limit profiles relating to the reinsured portfolios, controls on treaty capacity and expert judgment on the accumulation potential of reinsured covers had to be taken into account. In addition, reinsurers complained that the failure to split total sum insured values per zone into the underlying lines of business produced dramatic mis-estimation of the NatCAT loss potential. According to one country, the proposed set of factors represented an "average cost approach per zone" irrespective of the regional characteristics of the set of large NatCAT events required to define the 1 in 200 event, which would be relevant to capture the geographic spread of a specific NatCAT portfolio. Cover-specific loss caps (e.g. event limits, annual aggregates) could not be taken into account under a format which aggregated clients' exposure data as a first step. Furthermore, loss-reducing elements (e.g. deductibles applicable at original policy level) could not be taken into account appropriately. The calculation of the risk-mitigating effect of reinsurance business corresponding to intra-group operations was not possible as retrocession protection covered third party contracts as well. For reinsurance portfolios combining Motor Own Damage and Motor Third Party Liability covers it was difficult to determine the number of vehicles.

Some supervisors remarked that for reinsurers, the complex nature of their business should be addressed by partial internal models.

Reinsurers' feedback on their evaluation of the results derived by the different methods was split. Some participants stated that the results derived by the factor-based method were much higher than their partial internal model. However, one participant considered that the factor-based method understated the NatCAT scenario loss potential. It was commented that the factor to be used depends heavily on the NatCAT related premium level to be taken as the calculation basis.

Lack of clarity

Participants also asked for more guidance in the following areas: how to treat company-specific deductibles in NatCAT, the procedure for calculating the reinstatement premium (since such reinstatement will need to be defined taking into consideration the undertaking's remaining risk exposures as from the forecasted event; it needs to be clarified when in the year the forecasted event takes place), treatment of products that cover several risks, definition of volume measures used for calculating CAT risk, definition of exposure (turnover insured or exposure, outstanding or total, and at which point in time), and also the influence of the choice of the different x-year scenarios (calculations in the tool stipulated 5-year and 10-year scenarios).

General remarks

Several countries indicated that the industry generally considered the CAT sub-module to be too complex, inappropriate or difficult to implement, requires too much data and does not properly capture the risk. Two countries indicated that judgment was needed to decide which CAT scenarios applied, which led to a lack of comparability between results.

A few supervisors were also of the opinion that the CAT sub-module should be simplified (for example by reducing the number of scenarios) and in some cases felt that the calibration should be changed to avoid penalizing specialised non-life insurers particularly impacted by the high calibration of CAT risk. Two supervisors and undertakings in two other countries indicated that the treatment had not been appropriate for some niche players (for example there was no man-made CAT for legal expenses insurers or assistance insurance undertakings).

There was also a statement from one country (supported by the supervisor) that the combined non-life premium and reserve risk and CAT risk capital charges should not exceed aggregate limits in place in treaties accepted and retroceded. Two countries felt that the capital requirement for CAT risk is an inappropriately large component of the SCR.

Most undertakings had lower partial internal model capital requirements for CAT risk than those calculated according to the standard formula, but there were also some with higher or similar results.

5.10. Undertaking-specific parameters

5.10.1. Participation in the USP part of the exercise and comparison of USPs with standard parameters

It must be underlined that for the vast majority of countries, the participation was negligible with no more than five undertakings in any given line of business responding to this section of the exercise. In five countries, the sample size was limited to at most six to ten participants per line of business and the sample was of sufficient size for analysis only for the most popular lines of business in three big countries.

For lines of business like workers' compensation, non-proportional health, casualty and MAT reinsurance, there were no more than eight users in the whole of Europe. The most popular areas for the calculation of USPs were fire and other property damage (about 100 participants in the whole of Europe), motor vehicle liability, third party liability and motor other classes. Lines of business like medical expenses, income protection, MAT (marine, aviation and transport), legal expenses and miscellaneous also attracted some participants using USPs (46-76 participants).

Therefore the sample can not be regarded as representative. The main reasons given for failure to participate in this part of the survey were a lack of time (since the calculation was optional efforts were concentrated on other issues) and a lack of data consistent with the Solvency II format.

The median USP amounts for individual lines of business are presented in the tables below (some lines of business have been omitted as the sample is too small to draw any conclusions or calculate the median).

Table 14: Premium risk USPs

LoB*	Standard parameter	Median of USP	Sample size
Health - medical expenses	4%	4.1%	77
Health - income protection	8.5%	7.3%	76
Non life - motor vehicle liability	10%	7.7%	106
Non life - motor other classes	7%	6.8%	99
Non life - MAT	17%	13%	60
Non life - fire	10%	8.4%	116
Non life - third party liability	15%	10.7%	105
Non life - credit	21.5%	20.0%	30
Non life - legal expenses	6.5%	4.9%	46
Non life - assistance	5%	6.0%	22
Non life - miscellaneous	13%	9.8%	40

* Sample size for workers' compensation, non-proportional health reinsurance and non-life non-proportional reinsurance (property, casualty, MAT) too small to be included

Table 15: Reserve risk USPs

LoB*	Standard parameter	Median of USP	Sample size
Health - medical expenses	10%	11.6%	59
Health - income protection	14%	12.0%	61
Non life - motor vehicle liability	9.5%	7.4%	89
Non life - motor other classes	10%	10.2%	75
Non life - MAT	14%	13.3%	44
Non life - fire	11%	10%	87
Non life - third party liability	11%	8.4%	86
Non life - credit	19%	18.9%	26
Non life - legal expenses	9%	6.5%	34
Non life - assistance	11%	12.4%	14
Non life - miscellaneous	15%	18.2%	22

* Sample size for workers' compensation, non-proportional health reinsurance, non-life non-proportional reinsurance (property, casualty, MAT) too small to be included

The USPs were in most cases lower than the standard parameters. However, in some lines of business a significant standard deviation was observed (in both premium and reserve risk for MAT, credit, miscellaneous and non-proportional property reinsurance, and in reserve risk only for health medical expenses, and health income protection).

5.10.2. General comments

Participants commented variously that the use of USPs could represent a barrier to entry as new undertakings would not have the relevant and requested data, that it was a way to lower their capital requirements and that small and medium-sized insurers will not be capable of generating the statistical data base needed.

Some undertakings proposed allowing entity-specific lines of business with specific parameters and calibration or the replacement of all standard formula parameters with USPs, and many undertakings in different countries proposed extending the application of USPs to various different modules (see below). But there were also comments that the standard formula is already too complex and that the use of USPs should not make the standard formula resemble internal models and therefore the number of USPs allowed should not increase. Additionally USPs should not function as “internal modelling lite”, that is, a way to reduce the SCR without the rigorous qualitative requirements of internal modelling.

In general industry considered the requirement to have at least fifteen years’ data available too high a hurdle (in fact according to the technical specifications there is weighting with market parameters so that the minimum requirement is five years) and that the requirement for five years’ data would penalise SMEs and recent start-ups.

Some undertakings in one country commented that it seemed difficult to justify variations in parameters from undertaking to undertaking in what is supposed to be a standard method: undertakings that believe that different assumptions would be appropriate to them should apply this within an internal model and go through the associated approval process. In this way, the relevance of all the assumptions can be considered together as a package and there will be no ‘cherry picking’ of particular parameters they would like to change.

Some undertakings from several countries mentioned that they would prefer country-specific parameters.

Many undertakings from one country commented that there is no optimal approach to determining USPs, as all approaches have pros and cons. As a consequence, they proposed allowing further alternative approaches not already captured in the technical specifications. For instance, undertakings wanted to be allowed to choose methods adapted to each line of business instead of using the same standardised approach for all lines of business. These comments appear to be a misunderstanding of the requirements, as according to the technical specifications undertakings can use different methods for different lines of business.

For some undertakings, it was not clear from the technical specifications how they should decide if it would be appropriate to use a USP in place of a standard factor and they asked for more clarity on the conditions of application of the standardised methods, on which of the USP methods should be used under which circumstances, and on how this could be assessed. Undertakings would appreciate more detailed guidance and description of the standardised USP methods, as well as instructions for preparing data.

Undertakings in one country raised the issue of the calculation of USPs at points in time other than year end, as may be required for quarterly reporting or in case the SCR has to be recalculated: they argued that due to limited availability of input data, a projection or estimation of the required data would be necessary.

5.10.3. Assessment of QIS5 methodology for USP

One country commented that the standardised methods did not cause any major concerns.

The following general discrepancies with the QIS5 USP methodology were mentioned by participants:

- In cases where data availability was variable, the three methods led to very different (sometimes contradictory) results.
- There was a problem with the meaningful estimation of risk if the volume measure was small or the business was rapidly growing.
- Methods were not applicable for reinsurance business.
- Methods were too specific and too restrictive to be used to determine sensible USPs adequately reflecting the risk faced by the undertaking.

The most frequently mentioned problems in USP calculation for undertakings -referred to by thirteen countries - related to a lack of appropriate data (not compatible with the QIS5 requirements, collected under different systems, for example under different segmentations, in too short time series, unavailability of net best estimate ultimate after one year, lack of Solvency II-based figures such as historic best estimates, no data for revision risk). Other countries did not respond to this question as their undertakings did not test the USP calculation.

One country mentioned a lack of time for testing the proposed methodology as the main difficulty.

Regarding the methods tested by undertakings for premium risk, the most popular methods were the first one (eleven countries) and the second one (seven countries), which were based on the variation of ultimate loss. The fulfilment of assumptions was given as the reason for adopting these methods and some undertakings mentioned that the results were similar. Method 3 was rarely used due to higher results or higher data standards (three countries mentioned problems with data in this context).

For reserve risk, undertakings mostly used method 2 (nine countries) and method 3 (six countries), based on the Merz/Wüthrich approach. Countries mentioned as justification for using these methods: comparison with the Mack standard deviation, the theoretical basis (for method 2), and less demanding data requirements, since paid claim triangles are straightforward to extract. However, undertakings also commented that these two methods could not cope with zero or negative numbers in the first development period, and did not allow for model error. Some undertakings remarked that the results produced by methods 2 and 3 were low for some large motor portfolios or seemed unreliable. Regarding method 1, some participants found that it produced results consistent with their own internal analyses. The negative comments on method 1 were that the one-year reserve movement required a significant amount of time for the extraction of data, or that results were not valid.

In two countries all of the methods were tested by at least some participants.

Two undertakings used all relevant methods and calculated the average value. Two countries mentioned that undertakings calculated USPs using their own methods, so the results were not comparable.

One participant stated that methods 2 and 3 did not sufficiently take into account the premium margin/business cycle risk.

5.10.4. Suggested changes and improvements

Participants were asked to provide their own suggestions for other parameters which could be replaced by undertaking-specific ones. Many answers were outside of the scope provided by the Directive, for example requesting USPs in the following areas: counterparty default risk, market risk (especially property, equity), operational risk, correlation matrices at country level, CAT risk scenarios.

The proposals consistent with the Directive were as follows: parameters in the non-life CAT sub-module (especially in factor-based methods and for credit and suretyship), parameters in life CAT, parameters in expense risk, parameters in biometric risks (longevity and mortality risks), parameters in lapse risk and parameters in health for one country-specific system.

Participants suggested the following methods:

- Mack's formula and methods developed by Merz and Wüthrich, especially the bootstrap version of the MW method, the stochastic version of the Bornhuetter-Ferguson method (a standard in reserving practice), the ODP Bootstrap which is an industry standard method or more generally bootstrap on GLM and bootstrap techniques in general adjusted to a one-year time horizon, stochastic reserving methods in general, methods based on the standard error estimated according to the models used for determining the best estimate of technical provisions, and net casualty ratios.
- For premium risk, enhancing the current methods by allowing for the effects of premium/underwriting cycles or the specific characteristics of individual lines of business.
- An AR2 process to remove volatility inherent in underwriting cycle.
- A method based on frequency/severity widely used by insurance sector.

Some undertakings in five countries suggested using individual NatCAT models, either modelled internally or from external sources (e.g. RMS, Willis, AON Benfield, etc.).

5.10.5. Source of data, adjustments, assumptions, difficulties with data

Fifteen countries answered that in most cases internal data were used (claim triangles, historic earned premiums and incurred claim costs). Some countries also mentioned external sources (the previous insurer).

The calculation required various data adjustments and assumptions, for example:

- splitting by lines of business on the basis of expert judgment as the right segmentation was not available;
- stripping out large catastrophe losses;
- ultimate losses at the end of 2009 and not as recommended from the end of each accident year;
- undiscounted best estimate;
- underwriting year as accident year was not available;
- interest roll-up for discounted reserves; and

- calculating best estimate for earlier year claims using current regression coefficients and applying them to previous years' history under the assumption that current development is not different from previous years.

No mention was made of adjustment for inflation.

The most frequently mentioned difficulties were as follows: lack of data in the right format (available data were collected under the Solvency I regime), problems with different segmentations, isolation of large catastrophe claims and availability of historic net data.

5.10.6. Inflation adjustment

In many countries most undertakings were of the opinion that inflation is appropriately reflected in the data and that past experience is representative for the future, or even took the view that inflation has no material effect and so no adjustment is necessary.

Some participants pointed out that in practice such an adjustment would be challenging, since the impact of inflation would depend on a multitude of factors and would be likely to vary across different lines of business, different countries and different currencies. It would also be impacted by insurer-specific conditions (for example in relation to policy limits or contractual agreements), which would make it difficult to compare estimates across different insurers. Undertakings in one country were of the opinion that reliable estimates of the historic impact of inflation on claims are not readily available and that it can be difficult to strip out historic claims inflation, particularly for some lines of business (e.g. those with significant elements of commercial insurance). According to one country it is not possible to adjust for hyperinflation.

Undertakings from one country remarked that premiums should be adjusted correspondingly, as otherwise there would be inconsistency in the calculations.

In some countries a few undertakings considered inflation adjustments.

5.10.7. Supervisory views on USPs

One supervisor mentioned that undertakings had realised a considerable reduction in risk capital for non-life through the calculation of USPs and suggested developing USPs for reinsurance as many problems had been encountered in adequately taking account of risk mitigation techniques both in calculating the adjustment factor for premium and reserve risk and in the catastrophe scenarios.

In the opinion of another supervisor, USPs should be permitted for mortality and longevity as long as the insured group is large enough. Another supervisor indicated that the scope of application of USPs should be enlarged to cover almost all underwriting risk factors as an alternative for small undertakings. Additionally the calculation methods should be less prescriptive and more principles-based.

There were, however, some supervisors who argued against enlarging the number of USPs to prevent any evolution of the standard formula into internal modelling and to avoid cherry picking. One supervisor highlighted the need for balance in this context and mentioned the burden USPs pose for supervisors.

Three supervisors were of the opinion that the low number of undertakings adopting USPs was caused by lack of time and/or data, or the strict requirements. One supervisor noted that undertakings only had limited historical data, so the proposed use of internal data was unrealistic. One supervisor strongly opposed any softening of data quality standards by, for instance allowing reference to Solvency I technical provisions when determining USPs.

A few supervisors acknowledged there were issues with the appropriateness of the current catastrophe calculation, but were of the opinion that natural catastrophe factors could not be undertaking-specific due to lack of relevant experience and the short data series available.

One supervisor mentioned that a significant number of undertakings had used USPs and had not highlighted any particular difficulties.

Regarding methods, one supervisor expected the non-life calibration exercise to produce some other methods for calculating USPs; another agreed with its industry's opinion that the USP for revision risk should be reviewed.

It was indicated that additional guidelines and conditions of application were necessary. One supervisor would welcome a more prescriptive description than in the technical specifications regarding the ultimate after one year in method 1 for standard deviation for premium risk.

One supervisor was disappointed that relatively few participants calculated USPs: undertakings seemed to have difficulties with the data requirements for historic technical provisions on a Solvency II basis.

5.11. Risk mitigation

Risk mitigation techniques other than proportional reinsurance were generally seen as difficult to take into account within the standard formula, and a considerable number of participants reported problems relating to this topic. Concerns were mainly raised in the context of the non-life underwriting module. However there were also second-order effects extending to the counterparty default module, because there the risk-mitigating effect of reinsurance arrangements has to be taken into account with reference to its impact on the risk charges for other modules.

5.11.1. Non-proportional reinsurance adjustment in non-life

Most undertakings failed to determine the adjustment for non-proportional reinsurance in the premium risk factors because of problems with data availability. The calculations were also seen as too complex.

Table 16: Non-proportional reinsurance adjustment in non-life

Line of business*	Median of non-proportional reinsurance adjustment	Sample size (EEA)
Non life – Motor vehicle liability	81.2%	87
Non life – Motor other classes	99.4%	39
Non life – MAT	77.9%	27
Non life – Fire	81.4%	81
Non life – Third party liability	81.7%	87

* Sample size for credit, legal expenses, assistance and miscellaneous too small to be included

In fourteen countries no undertakings calculated non-proportional reinsurance adjustments. In ten countries the sample was at most seven undertakings in any line of business. The biggest sample for a single line of business was from one of the larger countries; it comprised 23 undertakings (in the most popular line of business) and was regarded by the supervisor as "sizeable".

A considerable number of countries raised concerns that the method for determining the non-proportional reinsurance adjustments in the premium risk factors was not suitable for every kind of non-proportional reinsurance (for example whenever the line of business was covered by more than one excess of loss treaty or in the case of the Marine, Aviation and Transport line of business).

Two countries mentioned that use of the formula had potentially undesirable consequences. For large undertakings with high retentions the adjustment would often be close to unity indicating no significant adjustment to the factors. For small undertakings the adjustment would often be materially less than one. The overall premium and reserve risk would therefore be smaller for small undertakings than large ones, which seems contrary to expected outcomes. There was also feedback that the definition of the data requested for the calculations concerning the reinsurance treaty was not entirely clear; in particular it was not obvious how to take reinstatements into account. Furthermore it was reported that the risk-mitigating effects of facultative reinsurance could not be taken into account, which often had a significant impact on the capital charge. One undertaking queried whether the average cost of claims needed to be adjusted for inflation, and if so, what index was specified.

Other difficulties concerned the requirements for detailed historical claims data which was not always available (for example in the case of claims in long-tailed lines of business which have not been fully settled, or in constructing a reinsurance claims triangle). It was commented that the calculation of netting down factors was also relatively complex and that changes to a reinsurance programme over time made it hard to obtain historic claims data net of the current reinsurance programme. Some undertakings encountered difficulties in calculating the duration of recoverables, and assumed the duration of the recoverables to be the same as the duration of the claims outstanding provisions.

Reinsurers commented that for a reinsurance portfolio a realistic derivation of the adjustment factor for non-proportional retrocession would require more detailed partial internal modelling. One undertaking also expressed a view that the USP approach fitted better and ensured a homogeneous treatment between lines of business.

One supervisor expressed the view that despite its limitations, this adjustment could be maintained in the Level 2 draft text. In thirteen country reports this issue was mentioned as one of the most important discrepancies in the non-life underwriting risk module. One country remarked that the adjustment should be considered further but that the tested methodology is inappropriate, and two others suggested the issue could be resolved with partial internal models. In one country several undertakings felt that they did not have sufficient time to gather the data and perform the calculations for the QIS5 exercise, but that they would be able to in due course.

Some undertakings reported the following adjustments and assumptions made in order to perform the calculation:

- netting down for non-life reinsurance and using available large claims data;
- using multiple years of data for the classes of business (general liability and motor liability) to which their non-proportional reinsurance applied, as those lines of business could have volatile results;
- using loss ratio assumptions that did not include any very large risks that would be reinsured with non-proportional reinsurance;
- using the approximations in the helper tabs for average outward attachments and limits; and
- applying the gross average claim cost to all claims, with no capping or limit.

Undertakings made some comments about changes they considered could be made to the adjustment for non-proportional reinsurance in the premium risk factors. The suggestions were as follows:

- Reinsurance calculations for premium and reserve risk should be extended to include other non-proportional reinsurance structures (e.g. stop loss).
- Capital charges for premium risk and reserve risk should be split, and allowance should be made for stop loss cover in reserve risk too.
- Using the observed volatility of the gross and net loss ratios to estimate the impact of the reinsurance on volatility.
- A distinction between mass claims and large claims, although it was noted that large claims have already been partly covered by the CAT sub-module.
- Introduction of a Pareto-based model in addition to a lognormal one, to more precisely model the skewed distribution.
- Deduction of the part of the stop loss cover that would be used for the segment-specific 1 in 200 year event (premium risk).
- Calculation of adjustment factors for all sub-segments and use of the premium weighted average as the overall adjustment factor (any segment that is not covered would have an adjustment factor of 1).
- Market data on average claims and standard deviations should be made available.
- Make an addition for captives as the loadings are too harsh.
- Use only large losses above a certain threshold, so less data is needed to calculate the adjustment.
- More flexibility to allow for possible retention clauses (e.g. aggregate deductibles).
- To allow for risk mitigation in the same way as in catastrophe risk.
- For EIOPA to develop an industry standard increased limit factor curve for each class.

5.11.2. Risk mitigation techniques in non-life CAT

In the QIS5 Technical Specifications, participants were asked to take into account their own reinsurance programmes. Many countries mentioned that in the catastrophe risk sub-module the effect of risk-mitigation was difficult to take into consideration in the standard calculation (especially in the man-made scenarios) and that its impact could therefore be underestimated.

Some countries referred to more specific difficulties which undertakings faced with risk mitigation, such as: including stop loss contracts (two countries) or excess of loss treaties (two countries), factoring in non-proportional reinsurance, netting down in case of facultative contracts (four countries), dealing with cases of more than one treaty on a line of business, netting down for quota share reinsurance with reinstatements. Some problems arose from the interaction between modules and the application of a reinsurance treaty to a number of catastrophes separately (without

needing to reinstate, or as many times as there are reinstatements). There was also uncertainty, especially in liability insurance, about what the nature of the gross loss was (e.g. large single claim or multiple smaller claims) and thus how reinsurance programmes should be applied, as this impacts on reinsurance recoveries.

For a natural catastrophe reinsurance portfolio including both pro rata and non-proportional covers the loss cannot simply be added up at a per-peril level. It was difficult for undertakings to merge approaches appropriately.

One country was of the opinion that the scenario approach was difficult to implement when the scenario impact exceeded the limits of a reinsurance treaty.

Related concerns were raised by reinsurers, who indicated that the standard formula is not able to properly take the complexity of their business model into account (see non-life catastrophe section above).

5.12. Participations

An amount of €377bn was reported in the QIS5 balance sheet in respect of participations. See section 3.4 for details on the valuation methods employed, and section 8.5.3 for details of the adjustment to basic own funds for participations in financial and credit institutions.

Under QIS5 participations in related undertakings were subject to a 22% risk charge where the participation was considered strategic; otherwise the appropriate global or other risk charges of 30% or 40% respectively were to be applied. One country felt that the differentiation between strategic participations and ordinary equity investment was dubious and could lead to regulatory arbitrage.

The table below analyses participations over the different categories, as a share of both the total number (1034) and total value (€1094bn¹⁴) of participations. It shows that overall undertakings regarded two thirds of their participations as strategic, applying a capital charge of 22%. Nearly all participations in insurance undertakings were considered to be of a strategic nature. Other types of participation were considered strategic more often than not. Where participations were not considered strategic and were therefore subject to a standard equity risk charge, the 'global equity charge' was generally applied (30% risk charge) instead of the 'other equity charge' (40% risk charge).

Table 17: Equity charges on participations

	Equity charge	Share of total number participations	Share of total value of participations
Participations in financial and credit institutions	N/A	13%	5%
Participations excluded	100%	1%	0%
Insurance strategic participations	22%	25%	30%

¹⁴ This figure does not tally with the balance sheet figure given previously (€377bn) as not all of the participation categories considered here were classed as 'participations' for balance sheet purposes (such as 'strategic investment other').

Insurance non-strategic participations	30/40%	3%	2%
Strategic investment other	22%	36%	38%
Other related undertakings - global equity	30%	8%	25%
Other related undertakings - other equity	40%	13%	1%

5.12.1. Strategic participations

The specifications did not describe the criteria to be applied in determining whether a participation was strategic or not. However the qualitative questionnaire asked undertakings to describe the criteria they had used in distinguishing strategic participations from other participations.

Responses to this question were provided by 28 out of 30 countries, although some noted that their response was based on data from only a few participants.

The criteria adopted are summarised in the following table. This sets out the range of approaches reported. In some cases these were freestanding but often they were combined. The third column indicates the most frequent combinations that were seen.

Table 18: Criteria for determining strategic participations

Number	Criterion	Number of countries reporting	Combined with other criteria
1	Long-term nature of the relationship	15	5, 4
2.	Participation is controlled (>50%) or wholly owned and/or fully consolidated	15	5,1,4, 7
3.	Based on holding >20%	11	5,1,4,7
4.	Long-term involvement in operations, management or board	8	1, 2/3
5.	Participation is intended to maintain or develop the activities of the participating undertaking or support its business model	20	1, 2/3
6.	Insurance participation or core to insurance activity	8	
7.	Ancillary or support to the participating undertaking (e.g. sales, IT, premises, staff, administration of investments)	7	2/3
8.	All participation except where disposal decided, likely or possible	5	
9.	All participations except those made as part of investment strategy	3	
10.	Driven by treatments as associates under accounting	2	
11.	Participation not in run-off	1	
12.	Participating undertaking holds a blocking minority	1	
13.	Participation represents > 1% of assets	1	
14.	All participations	2	

From this it can be seen that the emphasis was most frequently on a combination of:

- the degree of control – often citing control/full consolidation or subsidiary status;
- the long-term nature of the relationship or involvement in the participation; and

- the maintenance or development of the activities of the participating undertaking or support to its business model.

Items 6 and 7 can be regarded as a more granular expression of the same concept as the third bullet above.

It is notable that in only 2 countries was the view that all participations are strategic explicitly stated in the range of responses by industry.

6. SCR – Internal model

In the Solvency II regime the Solvency Capital Requirement (SCR) is to be calculated by undertakings in accordance with the standard formula (discussed in the preceding chapter) or using a full internal model, or using a combination of both a partial internal model and the standard formula. For QIS5, undertakings that are developing full or partial internal models were asked to calculate the SCR both with the standard formula and with the internal model. Additionally participants were asked to provide quantitative data in order to allow the impact of the use of internal models on solo undertakings' and groups' capital requirements to be assessed. In order to collect information on the current and future potential use of internal models in the EEA, there was also a qualitative questionnaire directed to all undertakings.

It should be emphasised that any conclusions drawn from the information on internal models are only representative with respect to the sample of responses provided, which in some cases was very small. Using the results from this small sample to infer anything about the general EEA-wide population might lead to biased conclusions, and hence the observations on internal models should be interpreted with caution.

Disclaimer: Due to the fact that undertakings' internal models have not yet been finalised and because of the small sample provided, no exact conclusions can be drawn as to the size of the capital requirements calculated by internal models compared to the capital requirements calculated by the standard formula. Furthermore some undertakings mentioned using internal model techniques which in EIOPA's opinion were not in accordance with the Level 1 text and the QIS5 Technical Specifications.

6.1. Internal models on solo level

The qualitative questionnaire for internal models was to be completed by undertakings:

- which are not part of a group and which currently use or intend to use an internal model;
- which are part of a group and are intending to use an internal model other than a group internal model for the solo SCR calculation; or
- which are part of a group and are intending to use a group internal model to calculate the solo SCR.

From the qualitative questionnaires it was found that:

- 262 undertakings (out of 309 which answered the question) were already using internal models for some individual aspects of their business; whereas
- 289 undertakings were currently working on the implementation of their internal model for Solvency II purposes.

Solo undertakings which were part of groups for the most part declared that they would be using internal models developed at group level; 159 out of 166 (96%) undertakings answered that they used the same methodology as the one used in the internal model for the calculation of the group SCR. Not many undertakings which belonged to groups reported that there were assumptions used for the calculation of the group SCR which did not fit their risk profile.

Most solo participants that submitted answers to the qualitative questionnaires referred to group internal models which would be used for both group and solo SCR

calculation. Local undertakings that are currently implementing internal models (in many cases they are only in the early stages) presented very detailed group answers without giving much information on the local level. This meant that EIOPA could not conduct any detailed analysis of the specificities of the solo calculation compared to the general characteristics of the internal model.

Below are presented the most common solo undertakings' comments about deviations from group internal models:

- solo undertakings used local information for calibration of the internal model (mentioned by ten countries);
- correlations among the various non-life lines of business were different at local level (mentioned by five countries);
- operational risk might be calculated by the standard formula at solo level (mentioned by three countries);
- the local internal model will use a different methodology for catastrophe risk (mentioned by one country); and
- the diversification factor will be undertaking-specific (mentioned by one country).

A few undertakings reported that they would not look to develop a specific internal model because the benefits of developing such an internal model would not outweigh the costs.

Regarding the cooperation between groups and local entities, almost all groups declared that they feed entities with the data and discuss with them the methodology and especially the local specificities. Some of the groups only validate the solo results, whereas others carry out the calculation at the ultimate group level.

It was noted that in all EEA countries which provided internal model results, many undertakings intend to submit applications just before or just after the introduction of the Solvency II regime. Some undertakings (which belonged to groups) commented that they have already been involved in the pre-application process because of their parent undertakings and also local supervisors.

It is worth mentioning that several supervisors reported that many undertakings indicated that they were going to use internal models to calculate SCR under the Solvency II regime (in many cases they had already entered into the pre-application phase) but did not submit any QIS5 results (either qualitative or quantitative) regarding internal models.

6.2. Current status of internal modelling in the EEA

Participants reported the following main reasons for using internal models instead of the standard formula:

- internal models better reflect the undertakings' specific risk profiles, additional risks are covered by the internal model beyond those covered by the standard formula;
- the internal model applies a more granular aggregation method than the standard formula;
- the standard formula does not take into account volatility; and
- to use IFRS valuation rules instead of QIS5.

In relation to the last comment, we note that internal models may be used to calculate the SCR but should not change the approach to valuation.

Undertakings also mentioned using different (internal) parameters to the standard formula in order to take into account the specific risk profile of the undertaking. But according to article 104 of the Level 1 text and the QIS5 Technical Specifications there is a restricted and closely-defined area where undertaking-specific parameters can be used. EIOPA's view is that changing the parameters of the standard formula themselves should not be considered as internal modelling and does not comply with the Solvency II requirements regarding internal models.

One supervisor mentioned that natural catastrophe risk might also be an area where internal models might better capture the undertakings' risk profiles than the standard formula. However another supervisor noted that even though CAT risk may be very substantial, particularly for non-life insurers, undertaking-specific partial internal models are often not a practical solution given the small size and relatively large number of non-life insurers. Another supervisor reported that monoline insurers claimed that the standard formula was not suitable for their business.

Regarding the structure of the internal models, some undertakings reported adopting a modular approach similar to the standard formula, some undertakings reported an approach broadly similar and some used approaches completely different to the standard formula.

Some individual undertakings also made comments on the parameters used in their correlation matrices. The internal models' correlation parameters varied from the standard formula in most cases from $\pm 25\%$ to $\pm 50\%$. Some examples of differences between the standard formula correlation parameters and internal model ones are given below:

- between operational risk and BSCR: 50% or 75% (standard formula 100%);
- between counterparty default risk and market risk: 50% (standard formula 25%);
- between non-life underwriting risk and counterparty default risk: 25% (standard formula 50%);
- between health underwriting risk and life underwriting risk: 50% (standard formula 25%);
- between interest risk and property risk (up): -50% (standard formula 0%);
- between interest risk and currency risk (up): -50% (standard formula 25%);
- between concentration risk and equity risk (up and down): 75% (standard formula 0%); and
- between spread risk and concentration risk (up and down): 75% (standard formula 0%).

6.2.1. Internal Model changes

Individual undertakings were at various stages in the development of their policy on internal model changes. Many undertakings are planning or currently working on the internal model change policy. Other undertakings reported that the process of defining major and minor changes was still under development.

Criteria which could be applied to distinguish between major and minor changes, as reported by undertakings, were the following:

- impact on capital requirements, for example using a threshold of change in the SCR - this criterion was mentioned by almost all countries;
- changes to the methodologies used to perform calculations;
- changes to the structure of the internal model;
- changes in the assumptions/parameters of the internal model;

- changes in modelling strategy, for example the aggregation technique;
- changes in governance;
- changes affecting the Solvency II compliance of the internal model; and
- changes in the underlying business.

Groups also mentioned using the outcome of sensitivity analysis before and after the change as a criterion, as well as whether or not there was a significant change in exposures.

Some undertakings also reported using internal committees to ensure the effectiveness of the internal model changes; for example, some undertakings reported substantial changes to the board in order to receive sign-off from the relevant board committees.

One supervisor mentioned that the borderline between major and minor changes was a difficult question and that both qualitative and quantitative thresholds might be needed. Another supervisor highlighted that in some cases while the process of the internal model changes was well organised, the definition of a minor or major change was still lacking.

6.2.2. External models

There was a wide range of responses that were provided about the external models likely to be used by undertakings. Participants which took part in the QIS5 study mainly used external models/programmes in the following areas:

- Natural catastrophe risk models.
- Economic Scenarios Generators.
- Tools for the calculation of the best estimate.

Undertakings' answers show that they mainly use external models/programmes to calculate catastrophe risk and to perform stochastic and actuarial simulation of cash flows.

One of the main concerns regarding external models, in the opinion of one supervisor, regards potential black box issues and the risk that some undertakings might not meet the documentation requirements as a result. Another supervisor mentioned that the real concern for them has arisen from models built or sold by vendors/consultants.

6.2.3. Probability distribution forecast

There is no particular trend among undertakings regarding the calculation of the probability distribution forecast, with some undertakings indicating that their internal models predicted the full distribution forecast and others that only key points were used to fit the distribution forecast. One supervisor reported that in many cases it has been seen that the full distribution forecast came after considerable enrichment of a distribution based on a small number of data points.

The most common method for producing the probability distribution forecast mentioned by undertakings was Monte Carlo simulation.

Reports of the number of simulations used varied widely, from 10,000 to as many as 100,000 (the median was 25,000 simulations).

For groups the responses were more homogeneous, with almost all of them stating that the internal model outcome would be the full probability distribution.

6.2.4. Future management actions

In most cases undertakings reported taking into account the following future management actions in their internal models:

- changes in asset allocation;
- changes in future bonus rates;
- changes in product charges or expense charges;
- changes in their reinsurance programme;
- dynamic hedging; and
- run-off decisions.

Some undertakings stated that in extreme scenarios, management actions may also include exceptional actions, such as closure to new business.

One participant which was part of a group mentioned that reinsurance and run-off actions would differ from the group internal model at local level. For another participant management actions were not allowed at solo level.

6.2.5. Calibration

Most undertakings use the same risk measure, confidence level and time horizon for economic capital in their internal models as defined in the Solvency II Directive: 99.5% VaR over one year. In some cases undertakings use a combination of risk measures, which means that in addition to the VaR risk measure they use for example a Tail Value at Risk (TVaR) risk measure as well.

Other risk measures were described as being used:

- for risks that tend to occur very infrequently but are associated with large losses;
- because they are more risk-sensitive in the tails of the probability distribution forecast;
- for internal purposes; or
- because the parent undertaking is under a different regulatory regime which requires a different risk measure.

Also:

- some undertakings use a higher confidence level for rating purposes;
- several different confidence levels are considered for internal management purposes;
- for internal steering purposes a lower confidence level is sometimes applied at solo level and a higher confidence level at group level; and
- in some cases a longer time horizon is used because it is deemed much more useful for running the business.

Most undertakings used the breakeven point or expected value as the attachment point for their internal models. Other possible attachment points mentioned were the present value and a rating agency cushion above the expected value. In terms of the group responses, most used expected value as the attachment point.

For most undertakings the same risk measures, confidence levels and time horizons were used for all risk modules covered by the internal model.

In the opinion of one supervisor the one year 99.5% VaR of basic own funds had become standard among undertakings. Nevertheless, it is worth mentioning the comment of the same supervisor that the main challenge for supervisors could be cases where the SCR calculation is based on the MCEV methodology.

The two following sections on validation tools and documentation are there to support the figures provided on internal models by highlighting the stage of development at which they are.

6.2.6. Validation tools

“Validation tool” means any approach designed to gain comfort that the internal model is appropriate and reliable. Comments received from member states regarding validation tools presented a wide range of views and in some cases they included unique answers from some undertakings. Some common examples of validation tools mentioned by undertakings include:

- back testing;
- sensitivity testing;
- stress and scenario testing;
- profit and loss attribution;
- benchmarking; and
- analysis of change.

Two groups also mentioned reverse stress tests.

It is worth mentioning some of the one-off answers regarding validation tools, for example:

- the use of consultants;
- interviews with the people responsible for developing and running the internal models as well as with the users of outputs of those internal models, including senior management; and
- some validation tools are embedded in software used by undertakings.

Regarding the stress tests undertakings made comments which in some cases were unique to themselves. In general the design and calibration of the stress tests are wide ranging. For undertakings which are part of groups design and calibration of the stress tests is mostly performed at group level. In the opinion of one supervisor the idea of reverse stress testing is not well understood within the industry and more guidance is necessary.

On the other hand there were also comments from undertakings that validation tools have not been chosen yet because the validation policy or definition of validation tools was still under development.

6.2.7. Documentation

In order to analyse undertakings’ current work on developing internal model documentation, a representative list of key documents (which would be required for internal model approval) was presented in the qualitative questionnaire and undertakings could choose one of three options to describe their current status:

- documentation complete - substantially fulfils the requirements;

- documentation partly complete or partially fulfils the requirements; or
- documentation does not exist.

In addition the documentation described both the general characteristics of the group internal model and the differences when it is used for the solo SCR calculation.

Complete

Undertakings reported that the following documentation was mainly complete:

- description of the Information Technology platform(s) used in the internal model;
- detailed description of the internal model methodology (complete at local level as well); and
- description of the contingency plans relating to the technology platform(s) used.

The documentation least often described as complete was the validation of expert judgment and the report of the validation test.

Undertakings using the group internal model for their solo SCR calculation reported that the following documentation was completed:

- qualitative and quantitative indicators for the coverage of risk; and
- risk mitigation techniques used in the internal model.

There was only one answer that documentation concerning the evidence of the use test at solo level was completed.

In progress

It was observed that the majority of undertakings were currently working on the documentation and that it was partly complete. Undertakings are currently working mainly on the:

- description of the underlying assumptions;
- model description and overview; or
- policies, controls and procedures for the management of the internal model.

The same tendency was observed for the undertakings which used the group internal model for their solo SCR calculation. Those undertakings also reported that their internal model user guide was not yet complete.

Not yet commenced

Most undertakings answered that the following documentation did not exist at all at this stage:

- results of the profit and loss attribution;
- model change policy and record of the major and minor changes; and
- description (report) of the results of the validation tests.

For undertakings using the group internal model for their solo SCR calculation it is worth mentioning that the following documentation was reported as not existing:

- evidence of the use test;
- description of the contingency plans relating to the technology platform(s) used; and
- validation of expert judgment.

In summary, internal model documentation is not being prepared simultaneously with the internal model development. The majority of undertakings mentioned that they were still in the process of developing certain aspects of the internal model documentation. It was found that most of the documentation concerning for example description of the internal model, the methodology used in the internal model or assumptions, was completed or partly completed. On the other hand most of the undertakings do not currently possess the documentation for the validation process or for the model change policy.

In the opinion of one supervisor a critical element concerning documentation is the usage of external models, particularly natural catastrophe external models which require the knowledge and skills of very specific experts.

6.3. General comparison of the internal model results with the standard formula

In QIS5 internal model results were requested in two forms:

- Method 1 - attribution of risks from undertakings' own internal model structure into the standard formula structure. This part of the spreadsheet was only for QIS5 purposes, to compare the results of the standard formula with those derived from internal models, and did not mean that undertakings' internal models had to follow the structure of the standard formula. Undertakings were asked to provide an approximation of what the results would look like if the internal model followed the standard formula structure.
- Method 2 - to present undertakings' own structure of internal models.

Undertakings were strongly encouraged to supply the requested data in both forms. It was also requested that the internal model results be aligned with (recalibrated to) Solvency II standards (99.5% VaR over one year).

It was recognised that because internal models might be very different from each other the quantitative information request on internal models might not be easily completed by all participants with internal models for assessing their capital needs.

It was also noted that in the opinion of one supervisor, internal model users should not be required to report their SCR calculation following the standard formula modular structure, since in most cases they may use a different structure (and for partial internal models they should only report following the standard formula for those modules in which the standard formula is used).

Overall SCR results

The overall SCR results are regarded in this report as the most comparable figure for analysis because it should include all risk factors and adjustments.

In QIS5 234 undertakings (about 10% of all participating undertakings) provided overall SCR results calculated by internal models. It should be emphasised that this meant EIOPA could not prepare detailed analysis of internal model results across the EEA.

Comparison of the internal model SCR and the standard formula SCR (based on the small sample) demonstrates the impact which internal models have on the final capital requirement.

Table 19: Ratio of internal model SCR to standard formula SCR

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	percentile							
SCR internal model to SCR standard formula	66%	83%	91%	107%	121%	99%	0.38	236

The table shows that the median of the SCR ratio across all undertakings was 91% and the weighted average was 99%.

Overall, for thirteen of the nineteen countries that provided internal model results, the median of the ratio was below 100%, with the other six countries displaying a median above 100%.

For large and medium undertakings the median of the SCR ratio was 93%, and for small undertakings the median was 101%.

On average in the figures provided by undertakings the internal model results were very close to those derived by the standard formula; however, there was variation at individual level.

In the QIS5 spreadsheet undertakings were asked to provide their economic capital figures. The term economic capital (EC) in QIS5 referred to the capital requirement used for the original calibration of the internal model, i.e. using the risk measure, confidence level, time horizon and the outcome as used by the undertakings.

Table 20: Ratio of economic capital (EC) to internal model SCR

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	percentile							
Economic capital to SCR internal model	100%	100%	110%	141%	148%	123%	0.37	111

As shown in the table the median of the EC ratio across all undertakings is 110%, with a weighted average of 123%. This ratio did not vary significantly between different sizes of undertakings, as the EC ratio was close to 100% for small, medium and large undertakings equally.

Groups which used full or partial internal models were also asked to provide the capital requirements coming from these internal models.

Table 21: Ratio of group internal model SCR to group standard formula SCR

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	percentile							
Group SCR internal model to group SCR standard formula	50%	60%	80%	90%	100%	80%	0.3	29

As shown in the table the median of the group SCR calculated via internal model is about 80% of the one deriving from the standard formula. It should be emphasised that the number of the group submissions including solvency assessment via group internal model is too low to allow differentiating between small, medium and large groups.

Three groups had higher SCR with their internal model than with the standard formula (one small, one medium and one large group). Three other groups had similar results for both methods (again one small, one medium and one large group). For the remainder (mostly composed of small groups), the SCR calculated with the internal model was between 46% and 90% of the SCR calculated with the standard formula.

Analysis of groups whose internal model SCR was higher than their standard formula SCR suggests that these groups are not well diversified and are characterised by a risk profile dominated by one type of risk. One of the groups indicated that for them this dominant risk was not quite covered by the standard formula. In other cases, the dominant risk was non-life underwriting risk, especially premium and reserve risk.

For the groups which had the lowest ratios of internal model SCR to standard formula SCR, it was found that in the standard formula calculation one type of risk always dominated. In two cases, currency risk was not identified as a risk. Furthermore, one group which operated in many countries claimed that its assets and liabilities were matched in terms of currency. The other risk which was not identified by those types of groups was the counterparty default risk for reinsurance.

Allocation of the group SCR to solo entities was in most cases done on a proportional basis calculating the contribution to the diversification effect.

6.4. Partial internal models

There are various ways to build partial internal models and the QIS5 spreadsheet could not accommodate all of them, but nevertheless the part of their SCR calculation covered by the standard formula should have been entirely covered in undertakings' submissions.

In QIS5 99 undertakings (about 42% of all undertakings which provided internal model results) provided SCR results calculated by the partial internal models.

Table 22: Ratio of partial internal model SCR to full standard formula SCR

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	percentile							
SCR partial internal model to overall SCR	51%	80%	86%	99%	110%	82%	0.37	100

As shown in the table the median of the partial internal model SCR ratio was 86% across all undertakings with a weighted average of 82%. One possible reason for the 90th percentile result being higher than 100% might be that in some cases the adjustments for the loss absorbing capacity of technical provisions and deferred taxes are not modelled in the partial internal model, despite being considered in the standard formula calculations.

Most undertakings which plan to use partial internal models indicated that they would use the standard formula for operational risk. Some of them will also use the standard formula for counterparty default risk. Operational risk will simply be added to the other risks. One interesting point is that those undertakings which plan to calculate only operational risk with standard formula treat their models as full internal models, when in fact they should be considered partial internal models. EIOPA's view is that any model that does not cover all material risks is a partial internal model.

It was mentioned by several groups that they were also intending to use the standard formula for operational risk due to a lack of data and in the awareness that this standard formula module lacks risk-sensitivity. For entities excluded from the scope of the internal model (for example when they are immaterial from the group's point of view), groups mentioned that they intended to use the standard formula.

The most common risk modules that undertakings plan to model are non-life underwriting risk, market risk and life underwriting risk. In some countries undertakings emphasised that they planned to develop an appropriate methodological framework for the other risks in the later stages of building their internal models. As far as the sub-modules were concerned, it seemed that undertakings predominantly intended to replace the natural catastrophe risk and premium and reserve risk in the non-life underwriting risk module with their partial internal model.

One country stated that for one undertaking the partial internal model will be used wherever the risk is significant, based on the materiality criterion set by that undertaking as $\pm 5\%$ of the SCR at the valuation date.

Undertakings which intend to use partial internal models under Solvency II mainly reported that they plan to use the standard formula correlation matrix, some stating they would replace the standard formula parameters with their own. EIOPA's view is that this latter approach would not be allowed.

Undertakings also reported the following methodologies for integrating partial internal models with the standard formula:

- a variance-covariance matrix, for example for the risks not covered by the standard formula;
- using one large correlation matrix to aggregate all risks;
- some sub-modules will be stochastically modelled all together; and
- in only two countries, undertakings mentioned that they would be using copulas to aggregate partial internal models with the standard formula.

One supervisor suspects that more elaborate aggregation techniques will evolve as undertakings go through the process and further guidance is given.

Undertakings did not generally provide details about how they specified major business units. One country commented that 'major business unit' was defined by one undertaking through consultation with the relevant members of management. One supervisor expected that undertakings' approach to partial internal models will adjust in response to the final outcomes on the standard calibrations (especially with regard to the catastrophe risk module).

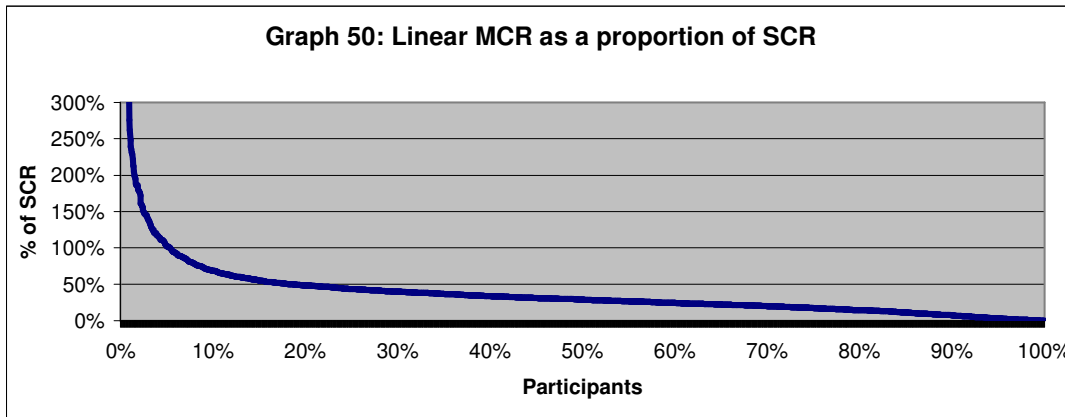
7. MCR

7.1. MCR calculation

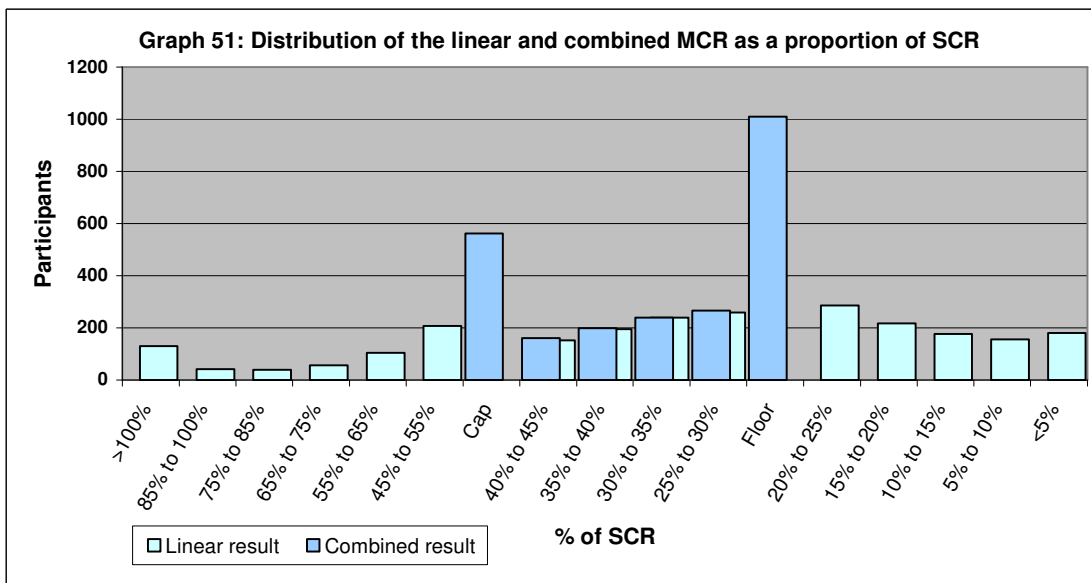
In general no major practical difficulties in calculating the MCR were mentioned by undertakings. There were a number of comments about the lack of risk sensitivity in the MCR, with a small minority of countries proposing it be set to a fixed proportion of the SCR. One country commented that there should be a separate MCR calculation for health.

7.2. MCR corridor

The MCR was subject to a corridor of between 25% and 45% of SCR, in order to ensure an adequate ladder of supervisory intervention in all cases. In the absence of this corridor the distribution of MCRs calculated would have been as follows:

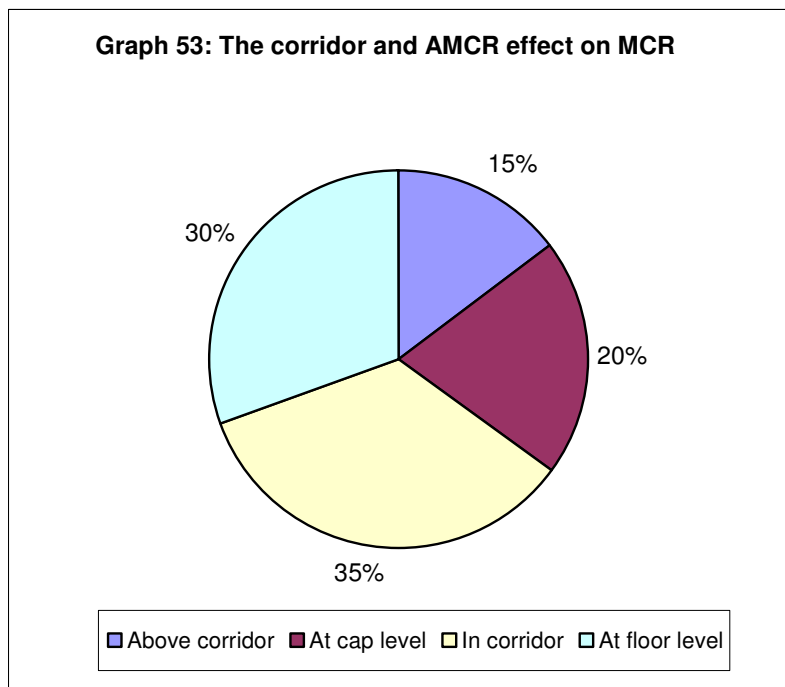
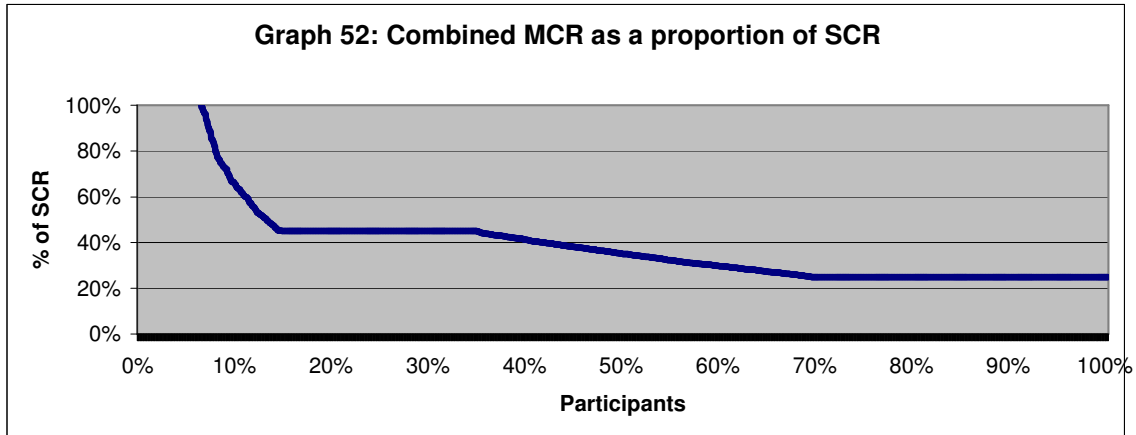


At EEA level 35% of undertakings' MCRs are already within the corridor and are thus unaffected by it. The MCRs of 41% of undertakings are subject to the lower limit while 23% of undertakings' MCRs are caught by the upper limit, giving the combined distribution below.



7.3. AMCR

As well as the adjustment for the corridor, there was also a requirement that the MCR be greater than the AMCR (Absolute Minimum Capital Requirement) levels set for non-life, life and composite undertakings respectively. For almost 15% of participants across Europe, this resulted in a final MCR above the 45% cap, and for 6.6% of undertakings, this final MCR was higher than their SCR.



Some countries were concerned by this last group, and questioned how the ladder of supervisory intervention would apply if there was only the hard limit of the MCR, without the additional limit of the SCR above it.

Some supervisors commented that a number of the undertakings which failed to meet their MCR were undertakings which would have been able to meet their calculated MCR, were it not for the AMCR coming into play and raising this higher.

Also on the AMCR, a few countries proposed that clarification on indexation and exchange rates for non-Euro AMCR will be needed going forwards.

7.3.1. Composite AMCR

There were some comments that the AMCR floor for composites (the sum of the life and non-life AMCR) was not consistent, and should be revised, especially in light of a number of undertakings being clarified as composites under the new regime. It was felt to be particularly penal for undertakings which only had a very small amount of non-life business.

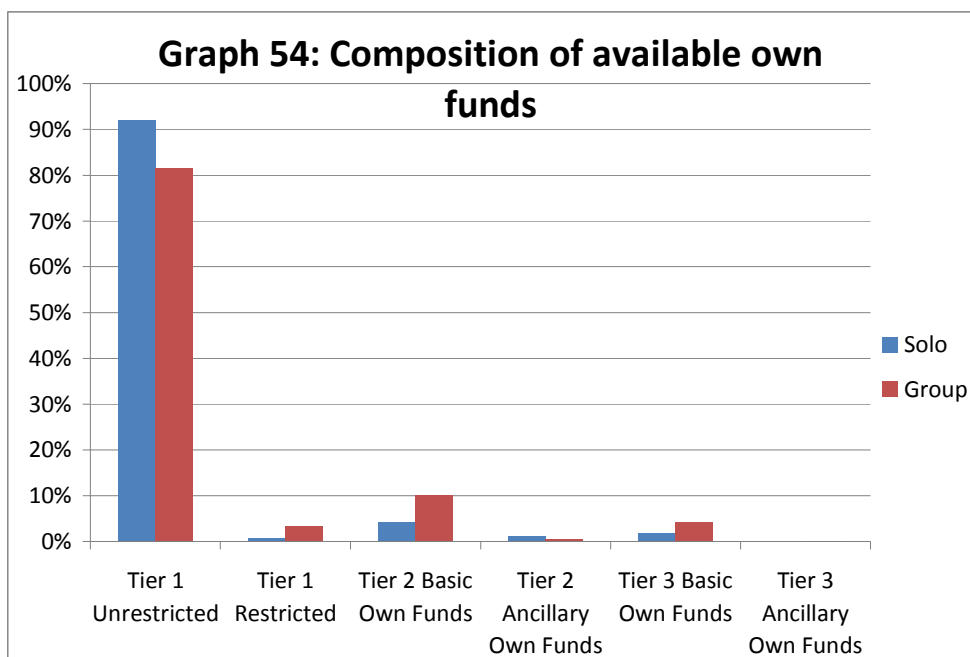
8. Own Funds

8.1. Composition of Own Funds

Under Solvency II there are two types of own funds: basic own funds on the balance sheet and ancillary own funds which are items which can be called up to absorb losses. Basic own funds comprise the excess of assets over liabilities which is broadly represented by ordinary share capital, the equivalent for mutual and mutual type undertakings and reserves together with subordinated liabilities.

The tiering system categorises the own funds items according to their loss absorbing characteristics. Various adjustments are made to take into account restrictions on the availability of own funds items, in order to arrive at the amount *available* to meet the Solvency II capital requirements. A system of limits establishes the amount of own funds *eligible* to meet the SCR and MCR respectively.

Available own funds amount to €921bn in total. Of this €846bn represents the highest quality Tier 1, which does not have any restrictions on its use to meet the SCR/MCR. A breakdown of the available own funds is below. From this it can be seen that the majority is basic own funds with ancillary own funds representing only 1.3%.



8.1.1. Composition for groups

When applying the accounting consolidation-based method, group own funds are determined by using the group balance sheet valued according to the QIS5 specifications. It therefore includes all insurance and reinsurance undertakings, SPVs, insurance holding companies and ancillary entities, both EEA and non-EEA. Own funds related to other financial sectors amount to less than 3% of total group own funds. This small share is partly due to the fact that some financial conglomerates did not include their banking sector entities in the QIS5 exercise. Group own funds derived from the insurance sector were adjusted to take account of the non-availability of

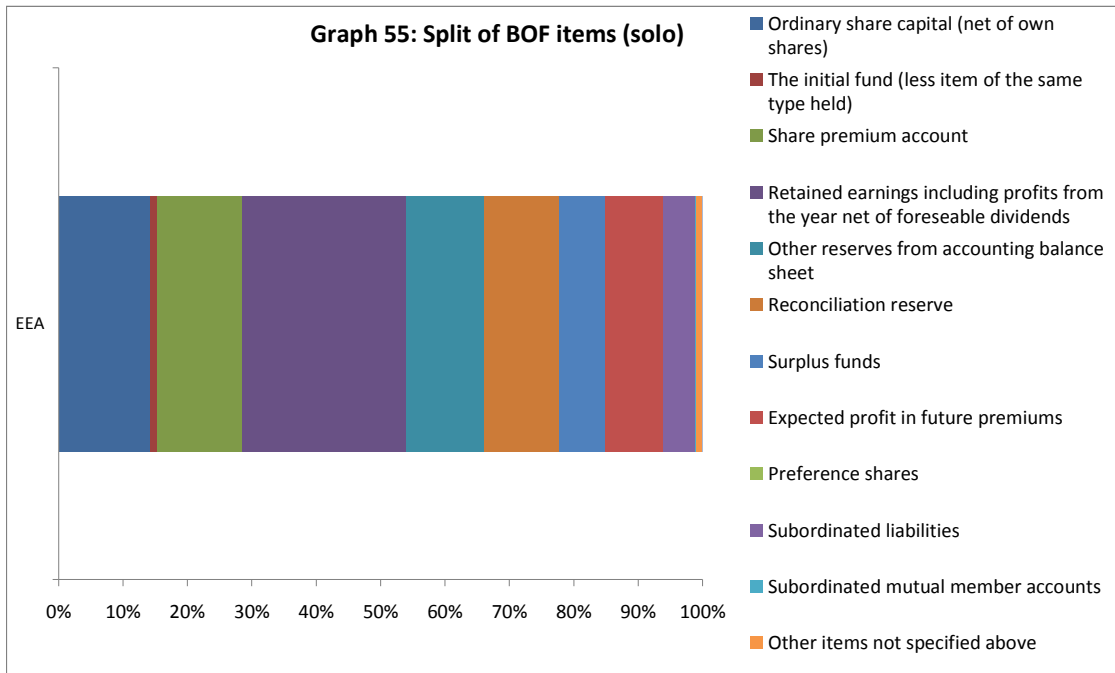
certain items and determine the level of group available own funds (see groups section of this report for further details).

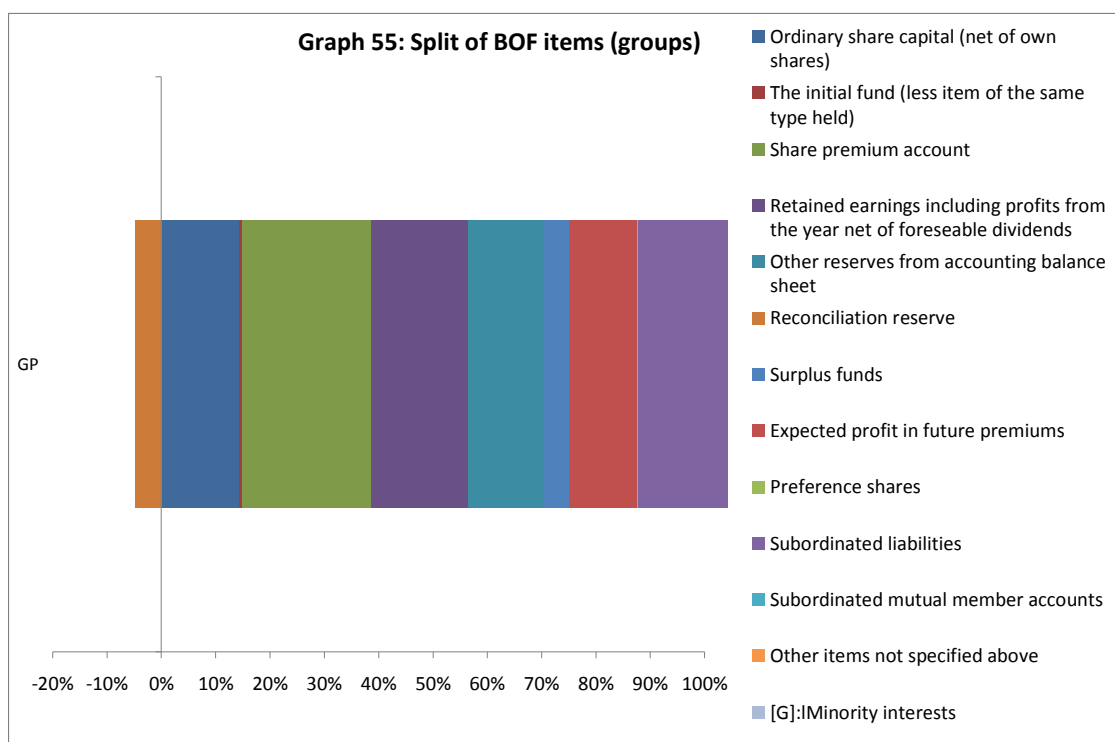
A breakdown of group own funds is in table xOF1 in the annex. Ancillary own funds represent less than 1% for the groups sample. The most significant difference as compared with the data for solo undertakings is the relative proportion across the tiers.

8.2. Unrestricted Tier 1

This represents the highest quality own funds and accounts for 91.9% of available own funds (for groups 81.5%).

QIS5 analyses the components of unrestricted Tier 1 by extracting the accounting balance sheet values for ordinary share capital, mutuals' initial fund, share premium, retained earnings and other reserves appearing in the accounts.





The above graphs set out the contribution of the different components of unrestricted Tier 1 highlighting the relationship between share capital and share premium and the reserves held by undertakings.

Surplus funds (as described in Article 96 of the Framework Directive) form a separate item in unrestricted tier 1 amounting to €69bn for all solo undertakings, which is significant for undertakings in a number of countries.

The reconciliation reserve is introduced in Solvency II to ensure that the basic own funds can be reconciled back to the excess of assets over liabilities. It demonstrates the effect of moving from the accounting balance sheet to the QIS5 balance sheet (although due to tiering effects it will not always be exactly comparable). It is not split up for classification purposes and counts as unrestricted tier 1.

Under QIS5 separate disclosure was made of an item representing expected profits included in future premiums (EPIFP) – discussed further below. This would usually form part of the reconciliation reserve, and so as a result of this separate disclosure a negative adjustment is necessary in order to balance the reconciliation reserve.

So both the net effect of balance sheet movements and the adjustment for EPIFP contribute to the make-up of the reconciliation reserve and thus to Tier 1 own funds. At EEA solo level the positive value of €110bn is driven by a €241bn reduction in technical provisions, offset against a decrease in asset values and an increase in other liabilities and reduced by the EPIFP adjustment. A different pattern emerges in the groups sample where the reconciliation reserve is negative (-€24bn). The net effect of balance sheet movements is less than the EPIFP adjustment. This is because the reduction in technical provisions of €102bn is offset by a comparatively larger decrease in asset values for the groups sample.

8.3. Comparison with Solvency I

Having examined the difference between the accounting balance sheet and QIS5 as depicted by the reconciliation reserve, it is also useful to compare own funds under QIS5 with Solvency I. Total basic own funds before adjustment under QIS5 were 27% higher than the Solvency I total. Informed by the presence of the reconciliation reserve it can be seen that changes in the valuation basis, particularly for technical provisions, are behind this increase. This is in conjunction with smaller changes affecting share premium and subordinated liabilities, and changes in surplus funds and retained earnings which offset each other in magnitude.

Out of 167 groups which participated in QIS5, 146 provided information on own funds eligible under Solvency I. Making the same comparison as above on the groups data, the increase in basic own funds under QIS5 against the Solvency I position is 38%. Again there are various items where increases and decreases largely offset one another, leaving the increase largely driven by the decrease in technical provisions.

8.4. Other paid-in capital instruments

Under QIS5 the classification of other paid-in capital instruments (preference shares, subordinated mutual members' accounts and subordinated liabilities) depends on the presence of certain features to enable the instrument to meet the relevant criteria for each tier. In the future these items will need to exhibit stronger loss absorbency characteristics in order to qualify as own funds and those eligible for Tier 1 (restricted to 20% of Tier 1) will need to demonstrate effective going concern loss absorbency.

8.4.1. Transitional provisions for own funds

Transitional provisions are key to the implementation of any new regime for own funds. While there will always be a policy objective of achieving full compliance with a new regime on an expeditious basis, an equally important objective is the prevention of market dislocation and the promotion of a smooth transition that has regard to the tenor of current issuance. Discussions around transitional provisions for Solvency II own funds are still underway with the aim of achieving this balance and so the transitional provisions tested in QIS5 are not final.

The contribution of hybrid capital and subordinated debt instruments to the capital base of the European insurance sector is a material amount in absolute terms, as well as being significant in terms of the debt capital markets more generally. However the impact is not uniformly distributed across the EEA, with a number of countries where undertakings make little or no use of this form of own funds.

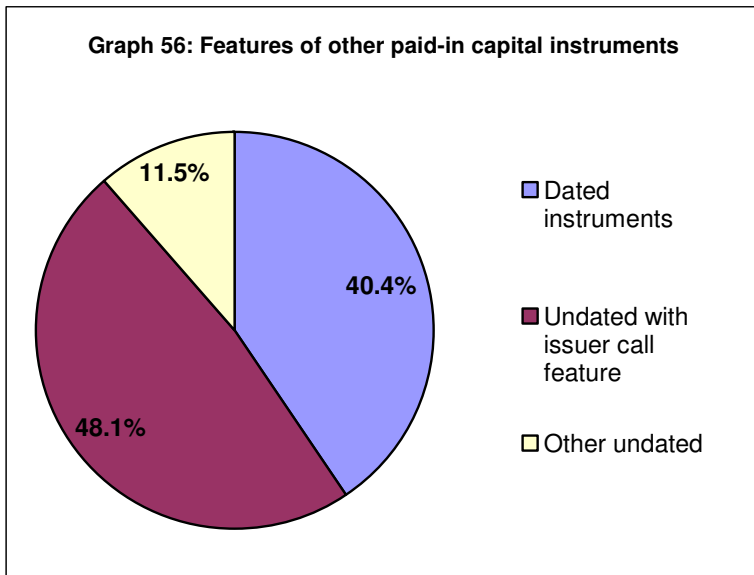
QIS5 was intended to test the application of the Solvency II criteria for basic own funds on the basis that all current capital instruments were measured for compliance as though Solvency II were in force. This was referred to as "without transitional measures". An additional scenario tested the position against the proposed criteria for transitional measures. The difference between the two was intended to demonstrate the extent to which transitional provisions are required in respect of capital instruments.

The quantitative results from QIS5 in this area do not give a clear picture. Undertakings across the EEA have reported existing hybrid and subordinated debt instruments in Tiers 1, 2 and 3 in the “without transitional measures” scenario. Supervisors in countries where these instruments are currently in issuance are of the view that these items should not qualify as basic own funds under this scenario. The technical specifications appear to have been interpreted very widely and somewhat optimistically by undertakings in arriving at the opposite view, notwithstanding their identification of transitional measures as a significant issue for them.

The data are further confused because the amounts reported for most categories of own funds under the “with transitional measures scenario” are lower than those without. This improbable result arises because not all undertakings have completed the “with transitional measures” submission. The basis of comparison between the two sets of data is therefore undermined.

However the amount of subordinated liabilities currently reported at the solo level by QIS5 participants gives a measure of the potential impact of, and need for, transitional provisions. The total amount of subordinated liabilities regardless of tier is €48bn. Preference shares used by some undertakings in certain countries amounted to €0.9bn and subordinated mutual members accounts to €0.2bn. The total for other paid-in capital instruments is €49bn representing 5.2% of available own funds.

The following graph sets out whether these instruments are dated or undated and with or without issuer call features.



Groups

Some of these capital instruments reported at solo level may be externally issued but a significant proportion is likely to be intra-group own funds. The need for transitional provisions must therefore also have regard to the position for groups

For the groups data the other paid-in capital instruments amounted to €83bn, of which subordinated liabilities represent nearly €82bn and preference shares €1.5bn.

Consistent with the position under QIS4, the proportion of group own funds represented by subordinated liabilities is, at 15.6%, higher than at solo level. This is due to the fact that groups raise capital at holding company level or via a capital-raising subsidiary within the group and then down-stream it to other group companies in the form of higher quality own funds. Table xOF5 in the annex provides a similar analysis of the instruments at a group level.

8.4.2. Features of other paid-in capital instruments

QIS5 sought to establish whether any existing instruments include the types of principal loss absorbency mechanism which are fundamental to the going concern loss absorbency characteristic for Tier 1 under Solvency II.

Write-down mechanisms and conversion features

A number of arrangements were described involving various features but none of these appeared to provide for the principal of the instrument to be written down.

Only one example of a conversion feature was provided. This involved the conversion, at a given trigger, of a subordinated liability into a profit sharing certificate representing the full principal and accrued and unpaid interest.

The feedback set out above confirms that the market would need to develop new forms of instrument in order to secure Tier 1 treatment under Solvency II. The responses also reinforce the expectation that if any existing instrument is to qualify for the "other paid-in capital instruments" category in Tier 1 (the 20% bucket), it will do so based on satisfaction of the transitional measures criteria in their final form.

ACSM

The qualitative questionnaire sought information from participants on the extent to which existing capital instruments contain alternative coupon satisfaction mechanisms (ACSM). For many countries there was nothing to report under this heading. Details were reported by six countries, with four referring to one example each and two others citing a small number of examples.

The ACSM described appear to have similar characteristics, generally providing for the issue or sale of ordinary shares to satisfy the deferred interest. In addition some also provide for the issue of alternative securities junior to or *pari passu* with the instrument in question. Helpful details on the conditions under which the ACSM operates were also provided in some cases.

The responses make clear that ACSM are not common throughout the EEA, but that their characteristics are in line with the general understanding of market practice in this area. A key aspect is that ACSM generally come into play at the point at which coupons are resumed and not at the point of deferral. This has been criticised as it may create a build-up of a commitment to issue ordinary shares at a time when recapitalisation might be seen as a higher priority than compensating hybrid debt-holders.

Whether a revised form of ACSM would be compatible with full flexibility on coupons and coupon cancellation upon breach of the SCR will depend on the detail of the Solvency II criteria.

8.4.3. Impact of tiering and limits

Having classified own funds into the respective tiers according to their satisfaction or not of the relevant QIS5 criteria, the limits operate in order to establish the amount of own funds eligible to meet the SCR and MCR respectively. The spreadsheet for QIS5 permitted undertakings to approach the calculation of eligible Tier 2 and Tier 3 in two ways. The so-called "top down" approach maximised the use of Tier 2 within the maximum 50% of the SCR and only when Tier 2 was fully utilised within this limit was any Tier 3 considered. In contrast the "bottom up" approach maximised the use of Tier 3 up to the limit of 15% of the SCR and then brought in any Tier 2 for consideration against the combined 50% limit. This approach was adopted to simplify the operation for QIS5; in practice under Solvency II undertakings would make their own choice as to the balance between Tier 2 and Tier 3.

The overall impact of the limits is difficult to assess because of the issues relating to the inappropriate inclusion of instruments under the "without transitional measures" scenario and the more limited completion of the "with transitional measures" scenario. However the following broad conclusions can be drawn:

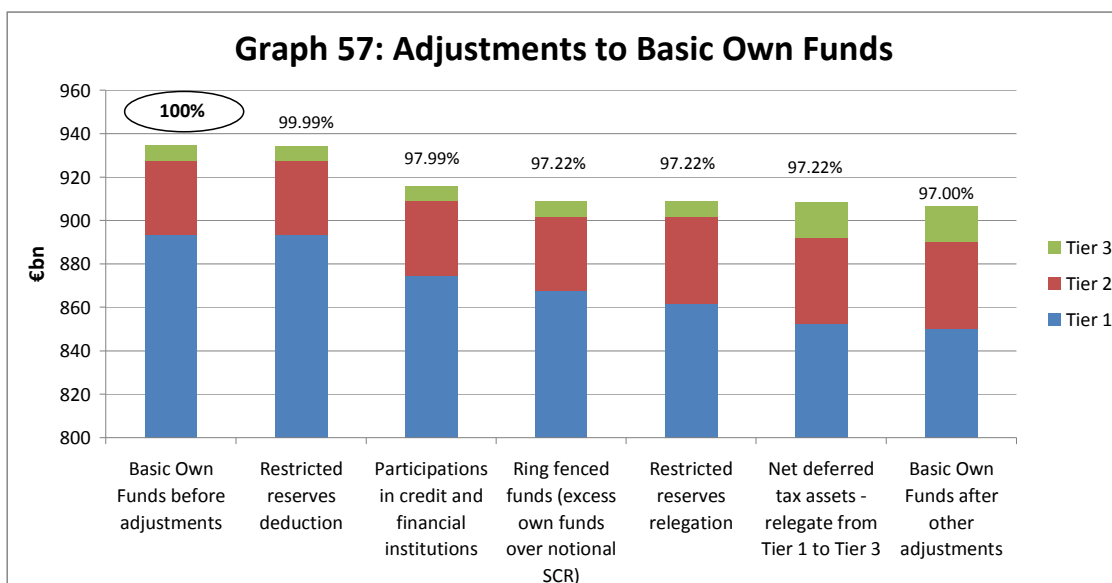
- From an overall perspective and on the basis of the data provided the choice of approach for applying the limits to tier 2 and tier 3 was not significant.
- Setting aside the issues regarding the inclusion of restricted tier 1, the 20% limit appears to cause significant restriction under the without transitional measures scenario.
- There are clearly anomalies in the with transitional measures data because the amount for unrestricted tier 1 varies even though it is not subject to limits and the choice of approach for tiers 2 and 3 appears to impact the eligibility of restricted tier 1.
- On the evidence of the data reported tier 2 limits do not appear to have a major impact.
- Capital instruments were also included in Tier 3 in both scenarios. Again the inclusion of these items under the without transitional measures scenario is unlikely and the technical specifications did not provide for transitional measures under Tier 3.
- The 15% Tier 3 limit appears to have a greater impact.

In general the pattern for the groups sample follows that of the solo data - particularly in that there is little if any difference between the top-down and bottom-up approaches. Restrictions due to limits can be observed in each of the three tiers. The greater significance of other paid-in capital instruments is marked, even though their allocation to tiers is unlikely to be reliable.

8.5. Adjustments to Basic Own Funds

These can arise in relation to ring-fenced funds, restricted reserves, participations in financial and credit institutions and net deferred tax assets.

The nature and quantum of the various adjustments are set out in the chart below.



8.5.1. Ring-fenced funds

The QIS5 Technical Specifications contained information designed to help undertakings identify when they have ring-fenced funds – that is, where own funds items have a reduced capacity to fully absorb losses on a going concern basis owing to their lack of transferability within the undertaking because the restricted own funds can only be used to cover losses:

- on a defined portion of the undertaking’s (re)insurance contracts; or
- in respect of particular policyholders or beneficiaries; or
- in relation to particular risks.

These restrictions may arise from statutory constraints or aspects of product design applicable to many undertakings, or in some jurisdictions from specific contractual terms relating to one or a small number of situations.

In order to gain insight into the types of ring-fenced arrangements, undertakings were asked to describe the arrangements giving rise to ring-fenced funds and the nature of the restrictions which apply.

A majority of countries reported that there were no ring-fenced arrangements within their territory. Six countries reported one or very few ring-fenced arrangements, and five reported several or many ring-fenced funds. Three countries had reservations about data quality and/or wanted greater clarity on what constitutes a ring-fenced fund to enable them to be confident about industry feedback.

Countries reporting ring-fenced funds did so on the basis that transfers out of the fund were restricted (or not allowed at all). Several countries reported with-profit funds. These have restrictions on transfers from the with-profit funds to shareholders. Individual pension plans were considered as ring-fenced funds in a number of jurisdictions.

In some cases where some undertakings or part of the industry concluded that there was no ring-fencing, this did not align with the views of the local supervisory authority or other parts of the industry. Conversely, there was one case where a ring-fenced

arrangement reported by the industry was deemed by the supervisory authority not to be ring-fenced.

The above results suggest that participants and supervisors would benefit from greater clarity about the characteristics of ring-fenced funds. This should lead to greater consistency in application. It should be emphasised that specific arrangements need to be individually assessed on the basis of the detailed contractual or legislative provisions that apply, in order to decide whether or not they are ring-fenced.

In terms of the calculations carried out by those undertakings identifying ring-fenced funds, it is clear from a number of supervisory comments that there are concerns as to manner in which the calculations were carried out or carried through to effect adjustments in the SCR and/or the own funds. Undertakings appear to have had difficulty recording the calculations consistently through the relevant parts of the spreadsheet.

QIS5 data reveal that 80 undertakings identified 218 ring-fenced funds spread across eight countries amounting to €17.3bn of assets. Once a ring-fenced fund has been identified it does not necessarily mean that there will be an adjustment restricting the own funds within the ring-fenced fund. Only if there are own funds in excess of the notional SCR will an adjustment be necessary.

Five countries account for €7.03bn in terms of adjustment to own funds. One further country reported a positive adjustment reducing the overall impact to €6.96bn. As there should never be a positive adjustment this further emphasises the need to promote a better understanding among undertakings.

8.5.2. Restricted reserves

The QIS5 Technical Specifications defined restricted reserves as reserves which might be required, whether under national law or under the specific statutes/articles of an undertaking, to be established and used only for certain prescribed purposes. The technical specifications expressly stated that equalisation provisions would form part of the reconciliation reserve and should not be treated as restricted reserves.

Because of these requirements, the amount of any own funds in excess of amounts being used to cover related risks within a restricted reserve is not available to absorb losses elsewhere in the undertaking on a going concern basis. Therefore undertakings were required to deduct any excess from Tier 1 own funds, and only to recognise it as Tier 2 if it was available to meet all losses in a winding up.

Undertakings were in some cases confused about identifying restricted reserves; many of the reported items were obviously erroneous and had been highlighted as such in supervisory comments. Examples of this included non-capital stock deposits, equalisation provisions (identified by undertakings in three different countries) and funds for the purchase of own shares.

Other items reported as restricted reserves appeared more like ring-fenced funds in nature, including with-profit funds and reserve for guarantees funds. Also, undertakings in two countries reported collateralised assets as restricted reserves. These should not be adjusted for so far as they match liabilities, but any over-collateralisation would more appropriately be treated as ring-fenced funds.

The only significant restricted reserves on which supervisory authorities commented were reported by 31 non-life undertakings in one jurisdiction. Another country referred to risk equalisation funds held by life undertakings and natural perils funds held by non-life undertakings as the key restricted reserves in their market. Additionally several countries had undertakings which reported reserves whose names suggested they could potentially be restricted reserves, or alternatively might be provisions or liabilities. These included four countries with undertakings reporting legal reserves/reserve funds, two countries with undertakings reporting risk equalisation funds/reserves, and undertakings within individual countries also reporting contingency funds, voluntary reserves, statutory reserve funds and legal development funds. In none of these cases did the supervisory comment indicate that these were restricted reserves; in one case they commented that a legal reserve was not a restricted reserve.

The qualitative comments appear to be borne out by the data.

An amount of €0.1bn was deducted from Tier 1 from undertakings in twelve countries. Under the terms of the technical specifications this indicates that these reserves should not be regarded as meeting the criteria for loss absorbency in a going concern (Tier 1) or in a winding-up (Tier 2).

More significant was the amount of restricted reserves which were relegated from Tier 1 to Tier 2. Under this treatment the amount of the restricted reserves in excess of the related risks is considered available to absorb losses more generally in a winding-up. In this category €5.71bn was reported across eight countries of which €5.50bn was accounted for by the single jurisdiction described above.

8.5.3. Participations in financial and credit institutions

The amount of the deduction was €18.6bn reported by 95 undertakings in 20 countries.

8.5.4. Net deferred tax assets

This adjustment is of a different nature to those discussed above, as it is made to account for the lack of immediate availability of the own funds, rather than restrictions on their usage as in the previous cases. The relegation of net DTA from Tier 1 to Tier 3 was reported by 408 undertakings distributed across all countries. The amount of €9.56bn represented 56% of available basic Tier 3 of €17.02bn. As noted previously the 15% limit for tier 3 does come into play. Assuming no other tier 3 items it is likely that for some undertakings net DTA would be subject to restriction.

8.6. Ancillary Own Funds

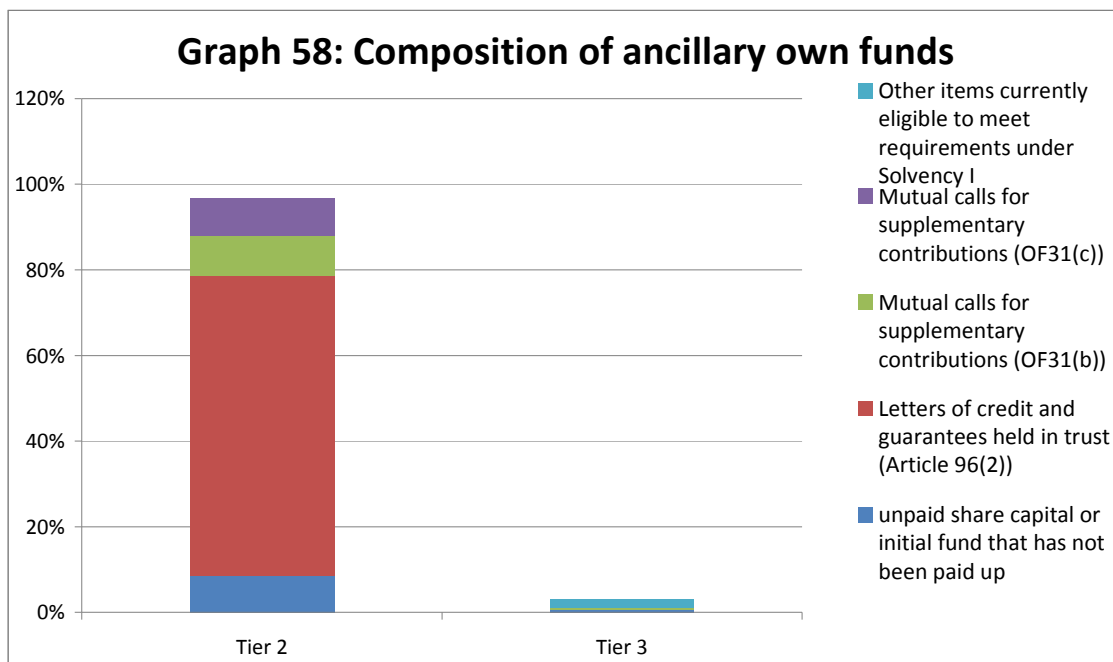
Ancillary own funds (AOF) as off-balance-sheet capital represent one of the key developments of Solvency II. Under the Solvency I regime certain items form part of the available solvency margin but will be treated as AOF under Solvency II. These are generally specific to certain market sectors – a good example is the calls which mutuals may make on their members. A more general framework for off-balance-sheet items extends the potential for undertakings to use such items although it is not clear to what extent they will seek to make use of AOF once Solvency II is implemented. The nature of AOF means that there must be the safeguard of

supervisory approval, as specified in the Framework Directive, before such items can be counted towards the SCR.

AOF are classified as ancillary tier 2 if on being called up and paid in they become tier 1 or otherwise as ancillary tier 3.

Ancillary tier 2 amounted to €11.6bn spread over thirteen countries of which €10.5bn was accounted for by three countries. Ancillary tier 3 was much less significant, with €0.1bn reported over four countries.

The graph below provides a breakdown of these amounts by type of ancillary own funds. A significant amount of the ancillary tier 2 represents letters of credit and guarantees held in trust by an independent trustee, as envisaged under article 96 (2) of the Framework Directive, together with supplementary calls by mutual and mutual type organisations, also referred to in article 96.



In addition to the quantitative results for AOF, QIS5 sought qualitative data on:

- existing items currently recognised as own funds but which would be AOF under Solvency II;
- existing items not counting towards the solvency margin but which might be AOF; and
- new arrangements for which AOF approval might be sought.

As well as providing a perspective on the potential contribution of AOF to the Solvency II regime these questions were also intended to assist supervisory authorities in assessing the likely calls on their time and resources for the approval of AOF during and after implementation.

For many countries there are no existing arrangements that might become AOF and for these, and indeed others where existing arrangements would become AOF, undertakings seem to envisage little concrete planning to develop new arrangements. There were isolated examples across a few countries suggesting the development of

letters of credit and the use of unpaid share capital subscribed by a parent undertaking.

8.7. EPIFP

QIS5 required the identification and calculation of an amount representing expected profits included in future premiums (EPIFP) and its disclosure as a separate item under unrestricted Tier 1. For this purpose future premiums are those taken into account as part of the cash inflows used to determine technical provisions under Solvency II. The identification of an EPIFP amount as a component of the excess of assets over liabilities within Tier 1 is intended to inform the continuing policy debate and Level 2 negotiations.

Industry does not generally have the data with which to calculate EPIFP as it is now understood. In order to provide a quantification as part of QIS5 a proxy methodology was developed in liaison with industry bodies which utilises the lapse risk methodology already specified for the SCR but re-calculates this for EPIFP purposes on the basis of a 100% lapse. Application of the proxy required undertakings to hold all other assumptions unchanged even if this involved creating artificial calculations of a paid-up amount for policies for which no paid-up amount arises or which would be void or cancelled if premiums were not paid in practice.

EPIFP attracted a significant level of comment during QIS5. The comments fell into the following categories:

- In a number of countries a proportion of life undertakings did confirm they were satisfied with the clarity of the methodology.
- But lack of clarity and difficulty in arriving at paid-up assumptions – particularly on the part of non-life undertakings – were generally cited across Member States.
- Calculations were described as time-consuming and burdensome and of questionable benefit.
- Undertakings questioned the concept and this affected the manner in which they engaged with the calculations or whether they attempted them at all.
- Supervisory authorities generally confirmed these comments and some suggested that the calculation should not be performed. A common theme was the potential significance of the amounts.

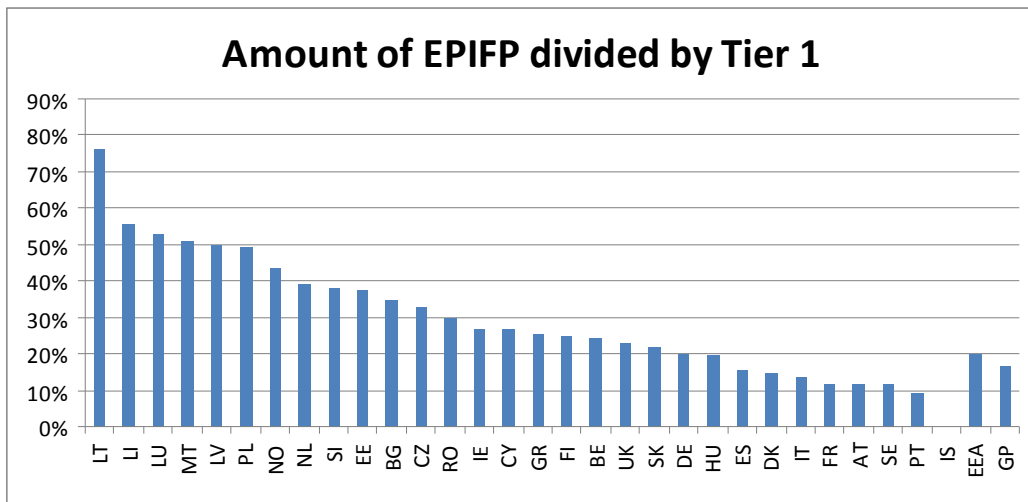
Within the spectrum of these reactions it is clear that a significant number of undertakings did not complete the calculation. Some set the result to nil and at the other extreme some undertakings set the amount at or greater than the amount of technical provisions and/or basic own funds.

While the results of the exercise can be used to inform the policy debate in this area the nature and extent of the commentary means that care should be exercised in the use of these data. In particular it is unlikely that the data obtained can be extrapolated safely.

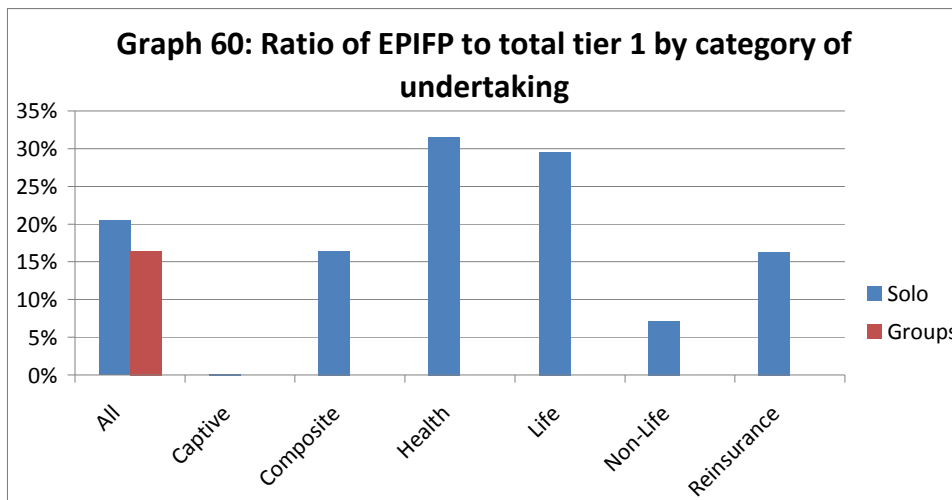
Of 2520 undertakings participating in QIS5 745 (29%) identified EPIFP. Across the different countries there was significant variation in levels of completion, ranging from nil to 80% with an average across Member States of 34%. Five countries accounted for 70% of the EPIFP total amount of €83.7bn. Putting these amounts in context the weighted average percentage of EPIFP to Tier 1 among undertakings was 20% with a median of 14%. However it should be noted that the Tier 1 attributable to the

undertakings which did identify EPIFP represents 45% of Tier 1 for QIS5 as a whole indicating that this group is drawn from larger undertakings.

Graph 59:



Not surprisingly EPIFP is a more important component of own funds for life and health insurers as compared to non-life insurers. As emphasised above though, results should be treated carefully, as they differ greatly between undertakings and countries. Furthermore, from the qualitative responses it appears that many non-life undertakings did not engage with this part of QIS5 or assumed it was relatively insignificant.



Further context can be provided by considering the data for EPIFP provided by the groups taking part in QIS5.

Out of 167 respondents, 96 submitted data related to EPIFP (57% of the total). The total amount reported was €61.5bn representing on average 16% of Tier 1. However, the 96 groups which did report EPIFP represent 76% of the groups' total eligible tier 1, reinforcing the finding at solo level that the data reported are derived from the larger undertakings and larger groups. Nevertheless, the reduced sample size means that many of the caveats set out above should also apply to the groups data. A number of groups stated that they found it difficult to carry out the calculation envisaged in the QIS5 Technical Specifications.

9. Groups

9.1. Participation and methods tested

167 groups from eighteen countries participated in the groups part of the QIS5 exercise at centralised group level. Compared to the participation in QIS4 (106 groups), this is a significant improvement.

Groups were asked to test the methods envisaged in the Solvency II directive for calculating group capital requirements. In particular, they were required:

- to test both the accounting consolidation-based method and the deduction and aggregation (D&A) method (calculating it with both Solvency II and local rules for non-EEA entities);
- to provide data, if relevant, related to the internal model calculation; and
- to provide data, on an optional basis, on the application of a combination of methods.

The results are reported in the table below.

Table 23: Groups participation by methods tested

	EEA groups without non-EEA entities	EEA groups with non-EEA entities	EEA subgroup(s) of non-EEA groups	Total respondents
S1 - Current calculations	109	38	4	151
SII – Consolidated method	120	41	5	166
SII – D&A (SII applied to the non-EEA entities)	99	36	3	138
SII – D&A (local rules applied to the non-EEA entities)	Not relevant	27	Not relevant	27
SII – Internal model	10	17	2	29
SII – Combination of methods	1	4	0	5
Sample size	121	41	5	167

As shown in the table, all groups apart from one tested the accounting consolidation-based method. Far fewer groups tested the deduction and aggregation method, citing time constraints, lack of familiarity with the D&A method, and the need for further guidance in the technical specifications as reasons for this. Nevertheless the sample is large enough for conclusions to be drawn about the differences between the two methods, and notably almost all groups with non-EEA entities have provided calculations for those entities according to Solvency II rules.

Finally, only five groups have tested a combination of methods, all using different approaches to combine them.

As regards the quality of the submissions, the assessments provided by the group supervisors varied from one group to another, depending in part on the group's participation in the previous QIS exercises. In most cases, the quality was assessed as sufficient. Areas where groups have encountered major difficulties relate to the

valuation and absorbing effects of deferred taxes and future discretionary benefits at group level, the treatment of ring fenced funds and intra-group transactions.

The table below outlines the number of participants by size: large groups were those which had total assets greater than €90bn, and small groups as those with total assets less than €30bn.

It is important to note the high participation rate among small groups, which explains most of the improvement in the participation rate between QIS4 and QIS5.

Table 24: Groups participation by size

	Total	Large	Medium	Small
S1 - Current calculations	151	17	22	112
SII – Consolidated method	166	17	23	126
SII – D&A (SII applied to the non-EEA entities)	138	15	22	101
SII – D&A (local rules applied to the non-EEA entities)	27	13	4	10
SII – Internal model	29	9	6	14
SII – Combination of methods	5	4	0	1
Sample size	167	17	23	127

9.2. Comparisons of the various methods and principal results

The following table shows that the vast majority (96.1%) of the capital requirements reported under QIS5 come from the core insurance business. 28 groups reported capital requirements for non-controlled participations, which on average represented 1.4% of their total group SCR. 65 groups reported figures for other financial sectors, which on average accounted for 5.4% of the total group SCR for those groups. It should be noted that most bancassurance groups only reported figures relating to their insurance business. The surplus amounts indicated throughout this report refer to the total group SCR.

Table 25: composition of the group SCR

Weighted average	Group SCR	SCR*	Non-controlled participations	Other financial sectors
Global statistics	100%	96.1%	1.4%	5.4%
Sample size	166	166	28	65

9.2.1. Total evolution of the surpluses between Solvency I and II

Before analysing the surpluses, it is worth mentioning the following caveats. This analysis assumes transitional measures on own funds: even when groups did not provide figures both with and without transitional measures, it was noted that in most cases they allocated own funds as if transitional measures were in place (by classifying most of their own funds into tier 1). Moreover, sixteen groups which had entities in non-EEA countries did not provide data on own funds according to local rules, leaving only eleven groups for which the surplus under the deduction and aggregation method with local rules could be analysed.

The table below gives a comparison of the QIS5 surplus against Solvency I under the different calculation methods.

Table 26: Ratio of surplus under QIS5 to surplus under Solvency I

Assumptions	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
SII - Accounting consolidation-based method	-78%	18%	75%	138%	259%	57%	359%	146
SII - D&A (SII applied to the non-EEA entities)	-131%	-20%	59%	120%	291%	28%	455%	124
SII - D&A (local rules applied to the non-EEA entities)	-38%	15%	63%	95%	113%	52%	68%	11
SII - Internal model	-68%	14%	102%	138%	177%	106%	753%	26
SII - Combination of methods	48%	49%	59%	72%	118%	75%	42%	5
SII - Highest surplus	-84%	41%	85%	148%	290%	98%	493%	147

For each method, the ratio of QIS5 to Solvency I surplus varies a lot between groups, as shown by the high standard deviation figures. Moreover, it was observed that some ratios were negative, which can be explained by negative surpluses (deficits) under QIS5 (as only two deficits were reported under Solvency I).

Accounting consolidation-based method

For groups using the accounting consolidation-based method with the standard formula there is a reduction in group surplus of around €86bn compared to Solvency I, from about €200bn to €114bn, resulting in a weighted average of QIS5 surplus to Solvency I surplus of 57%.

For groups that submitted internal model results, there was an increase in surplus of about €6bn moving from Solvency I to QIS5 resulting in a weighted average surplus of 106%. However, it should be noted that there was substantial variation in the individual groups' results.

Deduction & aggregation and use of local rules

On average, when groups applied the deduction & aggregation method rather than the accounting consolidation-based method, there was a significant reduction in surplus. This is due to the non-recognition of diversification effects under this method.

For groups with entities in non-EEA countries, the application of local rules instead of Solvency II rules had a significant impact on surplus, as shown by the change in the extent of the negative surplus for the 10th percentile of groups.

In order to estimate the overall impact of the application of local rules for all groups which reported capital requirements for the deduction & aggregation method using local rules (27 groups), and not only for the eleven groups which provided own funds calculated according to local rules, it was assumed that for the other groups their own funds under local rules were equal to their own funds valued with Solvency II rules. This approximation is acceptable, since for groups which did submit both results there were no significant changes in the level of own funds when using local or Solvency II rules. Using this approximation, the overall impact of using local rules for non-EEA entities under the deduction and aggregation method is about €45bn, justifying a transitional measure with review clause for a few third countries that have not yet met the equivalence test.

Five groups submitted results using a combination of methods, applying a mixture of the accounting consolidation-based method, deduction and aggregation and partial internal model to different parts of the group. For these groups the weighted average of QIS5 surplus to Solvency I surplus was around 75%.

Conclusions

Based on the above analysis (see also the table below), the group surplus eligible own funds under QIS5 were €86bn lower than under Solvency I if the accounting consolidation-based method with the standard formula was used. However, the surplus would only be €3bn lower if group internal models (partial or full) were used at their current stage of development and either equivalence were granted for third country jurisdictions or transitional measures were put in place allowing the use of local rules under deduction and aggregation for third countries. The table below shows that the impact of the different Solvency II calculation methods predominantly affected large groups.

Table 27: Ratio of surplus under QIS5 to surplus under Solvency I when using internal models and local rules for third countries

(€bn)	Surplus Solvency I	Surplus QIS5	Sample size
Results assuming internal models were approved and local rules under D&A for third countries were used			
Large	109.4	129.5	17
Medium	26.7	18.3	21
Small	64.3	49.5	109
All	200.4	197.4	147
Accounting consolidation-based method with standard formula			
Large	109.4	54.6	17
Medium	26.7	15.5	21
Small	64.2	43.6	108
All	200.3	113.7	146

9.3. SCR standard formula - diversification effects

9.3.1. Diversification at SCR level

Diversification

The group diversification effects are measured as the ratio between the group SCR calculated using the accounting consolidation-based method and the sum of the solo SCRs. In order to have reliable results, the numerator (group SCR) and denominator (sum of solo SCRs) of the ratio have to include all of the same entities. For consistency, the proportional share to be used when calculating the sum of the solo SCRs is set at the same percentage as the one used to consolidate the entities of the group when calculating the group SCR.

Table 28: Diversification effects

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Ratio of group SCR to sum of solo SCRs	65%	79%	90%	96%	100%	80%	18%	138
Diversification	35%	21%	10%	4%	0%	20%		

The table indicates that the diversification was on average equal to 20%. However it should be noted that this figure varied widely between groups.

The group diversification effects above use the sum of the solo SCRs including the capital charges on intra-group transactions. As a result these effects include both "real" diversification effects, following the application of the standard formula to a wider range of activities, and the effects of eliminating intra-group transactions. These two effects can be separated and analysed.

Intra-group transactions

Comparing the sum of the solo SCRs and the sum of the solo adjusted SCRs (i.e. net of intra-group transactions) makes it possible to capture the impact of intra-group transactions on total diversification.

Table 29: Intra-group transactions effects

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Ratio of sum of solo adjusted SCRs to sum of solo SCR	89%	98%	100%	100%	100%	91%	11%	140
Intra-group effects	11%	2%	0%	0%	0%	9%		

This table shows that the impact of intra-group transactions is on average 9%.

This overall effect should be regarded with caution for two reasons: firstly the intra-group transaction effects appeared particularly high for one medium size group (since it had a high intra-group counterparty risk charge at solo level, which was eliminated at group level through consolidation). Secondly, it should be noted that for many groups no intra-group transactions have been reported, giving a ratio of nil. It could be that these groups did not provide the adjusted data because they found it difficult

to do the calculation. As a result, the figures above are likely to be an underestimation.

“Real” diversification

The ratio between the group SCR and the sum of solo adjusted SCRs provides a measure of “real” diversification.

Table 30: Real diversification effects

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Ratio of group SCR to sum of solo adjusted SCRs	70%	83%	92%	98%	100%	87%	16%	138
Real diversification	30%	17%	8%	2%	0%	13%		

As shown in the table, the “real” diversification was on average 13%. The diversification effect varied according to the size of the group; it was relatively low for small groups (less than 5%), higher for medium groups (around 16%) and relatively great for the largest groups (around 21%). Diversification largely depended on the diversity of the group’s activities and locations, which was usually more material for large groups.

However, as mentioned previously, it should be noted that the solo adjusted SCRs were not always calculated accurately, meaning the “real” diversification effects may be overestimated.

It should also be noted that for some groups, the “real” diversification effects appear to be negative. This can be explained in two ways: firstly, when calculating the group SCR based on consolidated data, groups were required to consider all entities within the scope of the group, including for example holding companies; however, sometimes these entities were not included when calculating the solo requirement, leading to a negative diversification effect; secondly, in some cases the adjustment made for the loss absorbency of deferred taxes at group level was different to the sum of the adjustments made at solo level, which could also result in a counter-intuitive result for diversification.

9.3.2. Diversification at the level of the different risks

Intra-group transactions

This section provides a more in-depth analysis of the impact of intra-group transactions, analysing the adjustments for intra-group transactions relating to the different modules and sub-modules.

In the QIS5 exercise, groups were asked to provide the SCR calculation with adjustments for intra-group transactions under the following modules (and underlying sub-modules): market risk, counterparty default risk, operational risk, life underwriting risk, health underwriting risk and non-life underwriting risk, taking into account of their materiality. Intra-group transactions had the most significant effect on the market and counterparty default risk modules, with only a low impact on operational risk and no impact at all on the other modules.

However, as already mentioned, care should be taken in the interpretation of these results since groups reported difficulties with calculating the adjustments for intra-group transactions.

Market risk

The following table shows the impact of intra-group transactions on market risk, broken down into the underlying sub-modules.

Table 31: Market risk intra-group transactions effects (ratio of sum of solo adjusted market risk to sum of solo market risk)

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Market risk	84%	99%	100%	100%	100%	92%	11%	141
Interest rate	100%	100%	100%	100%	100%	100%	16%	138
Equity	68%	95%	100%	100%	100%	80%	149%	134
Property	100%	100%	100%	100%	100%	99%	15%	114
Spread	100%	100%	100%	100%	100%	99%	4%	139
Currency	100%	100%	100%	100%	100%	97%	19%	113
Concentration	99.9%	100%	100%	100%	100%	75%	13%	121

On average, the impact of intra-group transactions was 8% of overall market risk. In particular, the impact was material for concentration risk (25%) and equity risk (20%), while it was practically negligible for spread, interest rate, currency and property.

The high impact of intra-group transactions on concentration risk was linked to a small number of mutual groups, whose mutual insurance undertakings own a high share of proprietary companies. Concentration risk was therefore very high at solo level, as the assets of these mutual undertakings are largely composed of these participations. Due to consolidation, that concentration effect was eliminated at group level.

Counterparty default risk

Table 32: Counterparty default risk intra-group transactions effects

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Sum of solo adjusted counterparty default risk to sum of solo counterparty default risk	82%	99%	100%	100%	100%	62%	19%	138

On average, the impact of intra-group transactions represented 38% of counterparty default risk. One outlier group had a very high counterparty risk charge at the solo level which related to an internal reinsurance special purpose vehicle.

Diversification deriving from the application of the solo standard formula at group level

This section focuses on the effects of “real” diversification on the modules and sub-modules of the SCR. As before, the ratio used below is between the SCR calculated according to the consolidated method and the sum of solo adjusted SCRs.

The following table shows the SCR modules for which the impact of “real” diversification was significant.

Table 33: Real diversification by risk module

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Market	58%	86%	95%	99%	101%	89%	22%	139
Health underwriting	81%	90%	99%	100%	100%	90%	37%	128
Default	62%	90%	99%	100%	116%	84%	36%	135
Life underwriting	78%	89%	99%	100%	100%	92%	14%	115
Non-life underwriting	79%	93%	100%	100%	102%	91%	145%	114

Market risk

In terms of the sub-modules of market risk (see next table), interest, equity and concentration risks were significantly impacted, with highly variable outcomes between groups.

For some risks, “real” diversification appeared to be negative. This was especially evident for currency risk. This result can partly be explained by two considerations: firstly, groups included currency risks to holding companies when calculating the consolidated SCR but not when summing the solo SCRs; secondly, the QIS5 currency risks were calculated at group level on all own funds within the solo undertakings, and not only on the solo surpluses, creating more currency risk at group level when the assets of a solo undertaking were in a different currency to the currency of the group.

Table 34: Real diversification for market risk and its sub-modules

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Market risk	59%	85%	95%	99%	101%	89%	22%	139
Interest rate	47%	65%	94%	100%	100%	74%	31%	130
Equity	46%	91%	100%	100%	112%	87%	290%	130
Property	99%	100%	100%	100%	114%	103%	121%	111
Spread	96%	100%	100%	100%	107%	103%	18%	136
Currency	78%	100%	100%	100%	138%	130%	53%	108
Concentration	41%	84%	100%	100%	115%	85%	189%	86

Non-life catastrophe risk

In the non-life underwriting risk module, the impact of “real” diversification is most significant in the catastrophe sub-module which displayed diversification of 12%.

Table 35: Real diversification for non-life catastrophe risk

	10 th	25 th	50 th	75 th	90 th	Weighted average	Standard deviation	Sample size
	Percentile							
Non-life catastrophe risk	76%	90%	99%	100%	101%	88%	200%	104

The level of diversification can be explained by the way the sub-module is calculated according to the technical specifications. When summing the solo adjusted SCRs for non-life CAT risk, the most serious scenarios for each of the different undertakings are taken on board, whereas when computing the group SCR only the most serious scenario for the group will be kept. As a result, the calculation of the worst scenario at group level is lower than the sum of the solo worst scenarios.

9.4. Availability constraints on group own funds

The own funds of the related undertakings included in a group cannot all be considered available to cover the group SCR. For this reason groups have been asked to consider possible restrictions on own funds items located in solo entities which could prevent them being available to absorb losses elsewhere in the group.

For each related insurance undertaking, any non-available component of own funds in excess of that undertaking's contribution to the group SCR should not be included in group available own funds.

In addition, specific rules were set out for the treatment of minority interests: any minority interests in the eligible own funds exceeding the SCR of the subsidiary insurance undertaking should not be considered available for the group.

Table 36: Excess non-available own funds and minority interests

	€bn	Percentage of total own funds	Sample size
Total excess non-available own funds and minority interests	32.8	8%	109
Ring-fenced funds	5.4	21%	13
Other non-available own funds	16.8	5%	103
Minority interests	9.6	37%	45

109 groups have reported approximately €33bn of own funds which were not available to cover the group SCR (including minority interests). This is equal to approximately 8% of those groups' total own funds. Responses from groups indicated that restrictions on the availability of own funds were mainly related to surplus funds, ring-fenced funds and equalisation reserves. In addition, a few groups and supervisors also mentioned restrictions relating to own funds from entities located in non-EEA countries.

Only thirteen groups reported ring-fenced funds. The fact that in contrast 218 ring-fenced funds were reported at solo level suggests that many groups did not report their ring-fenced funds, making it difficult to draw any conclusions.

As regards the non-availability of minority interests at group level, not all groups have applied the limitations required in the technical specifications: 66% of groups participating in QIS5 reported minority interests in their balance sheet, amounting to

€26bn in total. However, only 45 groups reported non-available minority interests, of €10bn altogether.

A few groups indicated that their minority interests were not material and so did not make the required adjustments.

9.5. Other topics

9.5.1. Floor of the SCR

A group SCR floor applies when using the default method, equal to the sum of the MCRs of the participating insurance undertakings and the proportional share of the MCRs of the related insurance undertakings. On average, the group SCR floor is 42.3% of the group SCR. As a result, the floor has no impact on the group SCR.

9.5.2. Exchange of information within colleges of supervisors

Most group supervisors of large cross-border groups indicated either that they have already shared their QIS5 results with the college (15 groups) or that they plan to do so in early 2011 (19 groups). In general, the exchange of views and information on QIS5 results and conclusions was deemed useful by group supervisors. In a few cases the sharing of information with supervisors outside the EEA was considered of less use. One EEA group supervisor mentioned that national legal restrictions on confidentiality inhibited the sharing of QIS5 data related to the subsidiaries it supervises.

It should be noted that the sharing of QIS5 submissions within colleges is one of the targets in the EIOPA action plan for 2011 in relation to colleges of supervisors.

9.5.3. The potential effect of the diversification of the group risk margin

QIS5 aimed to test the potential effect of allowing diversification between entities when calculating the risk margins of insurance groups. This was done by comparing a default calculation (the sum of risk margins without diversification) with a calculation of the group diversified risk margin. However, in most cases the latter calculation was not provided, or did not give plausible results, so no direct assessment of the potential effect of such diversification has been possible.

However, EIOPA has conducted an alternative assessment of the potential diversification effect in the risk margin. For this assessment the potential diversification in the risk margin has been approximated based on the diversification effects of the group SCR. Just as in the solo level risk margin calculation, the SCR needs to be recalculated assuming that only the unavoidable risk modules are present.

Using the "recalculated" SCR the impact of diversification in the risk margin was assessed to be between 13.5% and 16% of the overall risk margin. As a percentage of the group SCR, the impact of diversification in the risk margin is between 3.8% and 4.8%.

10. Practicability and preparedness

10.1. Preparedness

The vast majority of undertakings reported that they were not yet fully prepared for Solvency II implementation, but that they expected to be by end 2012. The remainder included both those already prepared and those who felt they might miss the implementation deadline. However a few supervisors raised concerns that some undertakings were underestimating what is required.

Some countries identified no particular trends in the degree of preparedness between large and small undertakings, but others found that larger undertakings were generally better prepared. Some countries also noted that undertakings within groups tended to be better prepared, as they could draw on the group's expertise. One country remarked that undertakings which had taken part in previous QIS exercises had generally been better prepared.

A few countries noted that the complexity of the requirements was making preparations challenging, and others noted that concurrent changes to accounting standards and local regulations were also contributory factors. Several countries raised concerns that any significant changes to the requirements prior to implementation could cause problems or delays, and some observed that it was challenging to assess preparedness when the requirements had not been finalised.

In terms of the key areas of focus for preparation, almost all countries cited ensuring adequate quantity and/or quality of resource. The need for actuarial resources was particularly highlighted, with risk management also being mentioned. However in the context of this high demand, several countries raised concerns regarding the availability of resource in the market. Some also noted a resultant dependency on external consultants, especially among smaller undertakings.

Many countries also noted that training of existing resource would be an important activity in undertakings' preparations, with a number of them stating this would involve increasing awareness of the Solvency II requirements in the wider business.

Other areas that were commented on in almost all cases were improvements to data quality or data management and, sometimes linked to the latter, changes to IT.

Several countries said the Pillar II and III requirements would be among the key areas of preparation, some citing the ORSA in particular. One supervisor felt that undertakings were less prepared for Pillar II than Pillar I. A number of countries also said that further development of risk management functions, systems, or policies would be important.

Undertakings in some countries said that conducting a gap analysis would be an important step in their preparations, while others referred to the need to put a detailed project plan in place.

A few countries cited the alignment of existing processes with the Solvency II requirements as an important area, while others specifically referred to the need to bring reporting into line. In a few countries some undertakings reported that changes

to organisational structure were required. Some also said that they would have to either strengthen their corporate governance or better align it with Solvency II.

Some countries noted that their undertakings needed support from their parent groups in their preparations. Finally, a few countries cited working to better understand the requirements as an important activity in their preparation.

10.2. Practicability

This section aims to draw together the various practicability concerns raised by participants and supervisors, although many are covered in greater detail elsewhere in this report.

10.2.1. Complexity

All countries commented on at least some areas of the QIS5 specifications as being overly complex, burdensome and in some cases poorly understood by undertakings. Some noted that this imposed additional costs on undertakings in terms of the resources required for completion of the exercise. A few also commented that some elements seemed disproportionately complex given their overall impact, in particular the counterparty default risk sub-module and risk margin calculation.

The counterparty default risk sub-module was seen as overly complex by the vast majority of countries, and a few reported that some undertakings omitted it entirely. Respondents particularly referred to difficulties with the calculation of the risk-mitigating impact of counterparties and the production of LGDs. The calculations for reinsurance counterparties and the hypothetical SCR were also cited as causing problems.

The risk margin calculation was another element widely regarded as very difficult to complete without simplifications. Respondents commented in particular on the need to produce future SCRs and the unavoidable market risk element.

The equivalent scenario approach was viewed as extremely complex by the vast majority of countries, and in a significant number it was reported that it had not been calculated by many, or in some countries any, participants. The SCR adjustment in general was seen to be burdensome or of little added value, for deferred tax in particular, and a number of countries reported undertakings leaving at least some elements out.

Several countries felt that the adjustment for reinsurance, particularly non-proportional reinsurance, posed a challenge, as did the recognition of reinsurance in the CAT risk module and the valuation of reinsurance recoverables.

Other areas of complexity cited by a significant number of countries were the non-life and health CAT risk sub-modules, the EPIFP calculation, and the inclusion of embedded options and guarantees in contracts.

The look-through approach also drew comments from several countries, with structured credit, collective investment schemes and investment funds cited as products where this was particularly burdensome.

The lapse risk module and especially the requirement to calculate on a policy-by-policy basis was seen as complicated by a number of countries, as were contract boundaries, the illiquidity premium and the illiquidity premium shock.

Several countries reported that it had at times been difficult to reconcile the QIS5 specifications with existing industry practices and accounting standards.

Other areas of particular complexity cited were:

- The concentration risk sub-module.
- Cash flow projections.
- The premium provisions calculation.
- The spread risk sub-module.
- Inclusion and allocation of expenses.
- The currency risk sub-module.
- Undertaking-specific parameters.

10.2.2. Segmentation

Most countries also encountered some difficulties with segmenting business in the manner required by the QIS specifications. This particularly affected health business and the SLT/non-SLT split, with workers' compensation, personal accident insurance and the split between income protection and medical expenses business also cited as difficult areas.

Other areas mentioned were:

- Segmentation of life business, particularly in the lapse and mortality/longevity sub-modules.
- Division of counterparties into type 1 and type 2 exposures.
- Allocating the risk margin between LoBs.
- Segmentation of motor business.
- Segmentation of liability business.

10.2.3. Data requirements

There were also a number of areas where data requirements were seen as excessively burdensome – these often coincided with areas seen as particularly complex.

Non-life and health CAT risk were the key areas where data requirements were seen as cumbersome, particularly the man-made CAT shocks. The data requirements for the counterparty default risk module were also widely found to be difficult to satisfy, in particular in relation to reinsurance counterparties.

There were also some availability issues with the data needed for the look-through approach, particularly in relation to structured credit, OEICs and investment funds. Some countries also suggested there were weaknesses in the data which participants used for the risk margin calculations.

Other data requirements found to be difficult to satisfy were:

- For the calculation of best estimates.
- For the adjustments for reinsurance.
- Data on ratings for market risk.
- For the calculation of future premiums.

A number of countries noted that start-up undertakings struggled with elements where historical data was required, such as in calculating technical provisions.

10.3. Guidance

There were a number of areas where members reported that the specifications were not sufficiently clear or that further guidance would be appreciated.

Foremost among these was contract boundaries, commented on by a significant number of countries. Several respondents also fed back that EPIFP and the illiquidity premium could benefit from additional clarification.

Those were the only significant trends, but other areas where greater clarity was called for were:

- Segmentation of health business.
- Ring-fenced funds.
- The non-life CAT risk scenarios.
- Application of the proportionality principle.
- The adjustment for the loss absorbing capacity of deferred tax/technical provisions.
- The definition of strategic participations.
- The single equivalent scenario.
- The definitions of written or earned premium.
- Lapse risk.
- Definitions of counterparty types.

10.4. Technical Provisions simplifications

All of the proposed technical provisions simplifications were used by undertakings in QIS5. The use of simplifications varied between countries but some were frequently adopted by many undertakings across Europe. One reason for the great interest in simplifications was that the calculation of technical provisions was generally found to be complex in some areas, time-consuming, and demanding in terms of resources and data. In some countries the use of simplifications was found to be most common among small and medium-sized undertakings. Countries also indicated that in some cases large undertakings also used simplifications.

Most countries agreed that the calculation of the risk margin was too complex and observed that undertakings were often unable to carry out the full calculation. Undertakings of all sizes adopted simplifications for the projection of the future SCR. Countries strongly supported the use of simplifications for calculating the risk margin, and felt this needed to remain a possibility in the future. See section 4.3.1 for further details on the simplifications used.

In addition to the risk margin simplifications, the table below shows the other frequently-used simplifications for technical provisions. We note that the simplification that topped the list was the method based on expected claims ratio, used by seventeen countries.

Table 37: Most frequently-used technical provisions simplifications

Simplifications	Number of countries used in
Premium provision - method based on expected claims ratio	17
Expenses and other charges	15
Financial options and guarantees	14
Biometric risk factors	13
Surrender option	13
Reinsurance recoverables – first simplification (duration-based formula)	13
Premium provision – method based on pro-rata of premiums	12
Outstanding claims provision – second simplification or sufficiently similar method	12
Other options and guarantees	10
IBNR claims provision – first simplification or sufficiently similar	10
Future discretionary benefits	9
Outstanding claims provision - first simplification or sufficiently similar	9
Investment guarantees	8
IBNR claims provision - second simplification or sufficiently similar	8
Reinsurance recoverable – second simplification (duration-based table)	8
Other life insurance simplifications	5

Countries also indicated that further development is needed to make the QIS5 simplifications easier to apply.

Some countries reported that more guidance on the application of the proportionality principle is needed. Some of them asked for explanatory examples and a definition of materiality thresholds.

Some other countries said that in general the application of the proportionality principle seemed sufficiently clear for non-life, whereas for life business it had not been used as often due to ambiguities in the technical specifications.

Other countries considered the QIS5 Technical Specifications to be sufficiently clear on the application of the proportionality principle.

One country proposed a simplified method for the calculation of claims provisions in health due to the lack of a long-tail distribution in the claims provisions.

Some countries expressed the view that the simplifications were not always appropriate and felt that undertaking-specific simplifications should be allowed.

One country suggested that the simplification for options and guarantees is needed for small undertakings.

Some countries noted that a simplification for EPIFP would be helpful for undertakings.

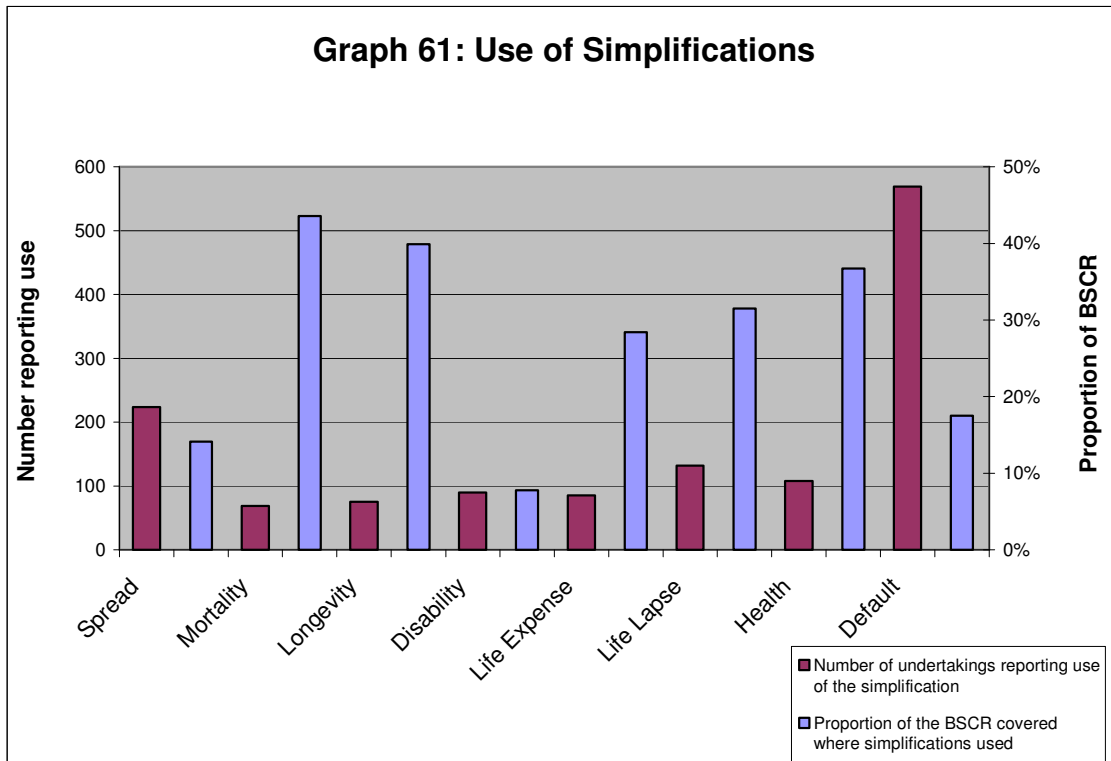
Another country mentioned that for annuity business technical provisions a deterministic approach could be taken to contracts where there is no policyholder optionality, instead of a probability-weighted average of future cash flows approach. The same country said that some undertakings had remarked that for some business classified under life it would be very helpful, and appropriate for the business lines in question, to use certain non-life simplifications.

10.5. SCR simplifications

10.5.1. Existing simplifications

Use of simplifications

The simplifications were reasonably widely used and all simplifications were used by at least some undertakings. By far the most adopted was the simplified approach offered for counterparty default risk.



The above graph shows the number of undertaking which reported making use of the different simplifications: this should be seen in the context that some supervisors were of the view that the true number of undertakings making use of simplifications might be some way higher than those reporting it. The graph also shows on average what proportion of the BSCR was affected by the simplification in the cases where it was used.

Where simplifications were used, they could sometimes affect a substantial proportion of the SCR, particularly where they were adopted for mortality, longevity and health.

Comments on simplifications

There was not a great deal of comment on the existing simplifications, indicating that they were generally well received. As the most used, the counterparty default risk simplifications were correspondingly the most commented on, though still only by undertakings in a handful of countries, with a variety of concerns being raised:

- that the simplification for calculating the risk-mitigating effect of reinsurance counterparties failed to take into account diversification between perils and lines of business;
- that it did not take into account catastrophe risk mitigation;
- that the allocation of risk-mitigating effect between counterparties was arbitrary and didn't reflect the true risk position, although other participants felt this was preferable to calculating the effect for each counterparty individually;
- that no allowance was made for the number of reinsurers; and
- that if the reinsurer for the coming year was not the same as in the previous year, it would not reflect the risk appropriately.

Individual countries also raised concerns in relation to disability, longevity and lapse simplifications: one comment on the latter was that it still required the calculation of surrender strains on a policy-by-policy basis and was therefore still quite complex.

There were also a couple of comments on the captives simplifications: that for interest rate risk, factors rather than just the simplified durations should be given, and that for shocks on technical provisions, durations should be given.

Comments on proportionality principle

A considerable number of countries felt that further guidance on the proportionality principle and the use of simplifications would be useful. Some felt this was necessary in order to ensure simplifications were not used inappropriately, although others emphasised that this had to be balanced with sufficient flexibility in the criteria to ensure that simplifications could be used where needed.

A few countries noted that the criteria for using the simplifications could be paradoxical, in that in some cases you could not demonstrate that the criteria were met without performing the calculation that the simplification was intended to circumvent. Another comment suggested that the criteria be based on the relative impact of the module on the SCR rather than the size of the undertaking.

10.5.2. Additional simplifications suggested

There were a number of areas in which undertakings requested or suggested additional simplifications, often to elements of the standard formula which were seen to be particularly complex. Some supervisors noted that in some of these cases what was really needed was a reduction in the complexity of the standard formula, rather than additional simplifications being made available, expressing their concern that offering more choices to the standard formula might impair the comparability of results.

Counterparty default risk

Although the existing simplifications for counterparty default risk were relatively widely used, this was nonetheless cited by most countries as a key area where

additional simplifications would be beneficial, with some countries suggesting that the current simplifications were still too sophisticated.

In particular it was felt that calculating the risk-mitigating effect of counterparties) could benefit from simplifications or a simplified standard approach. Suggestions were:

- That the risk-mitigating effect be set based on the SCR of the reinsurance;
- Instead of recalculating SCR for each counterparty, to allow VaR values for derivatives and something similar for reinsurers;
- To calculate XL treaty reinsurance recoverables as the average recuperation of the treaty to the reinsured;
- That the total risk mitigation be calculated and allocated to counterparties based on their share of recoverables;
- That the risk-mitigating effect be set as a flat percentage of LGD, although this was not supported by the supervisor;
- To use the national accounting value for LGD where the exposure was not material, or to use balance sheet values throughout; and
- To group counterparties by rating.

In addition, undertakings in some countries offered ideas on overhauling the overall approach of the counterparty risk calculation. Suggestions were:

- To replace the variance term with a factor for each rating;
- To reinstate the formula from QIS3; and
- To use factors based on the asset value of the risk mitigant, the credit quality of the counterparty, and the length and type of exposure (using higher factors where the counterparty has a risk-mitigating effect).

Market risk

Look-through approach

A significant number of countries saw scope for simplifications to the look-through approach used in the market risk module, particularly for investments in unit-linked funds (with some noting that most market risk in relation to these liabilities would be borne by the insured, and so it was not a material area). Simplifications proposed for unit-linked funds were:

- To use the asset type split by the fund's asset allocation or investment mandate;
- To use approximations of asset allocations, currencies, ratings and durations of investments; and
- To assume all assets are equities and make a high-level currency split.

The other key area of comment was structured credit, with a couple of participants proposing that the direct approach (rather than look-through) be used for these assets: supervisors were generally less supportive of this idea.

Spread risk

Spread risk also drew a number of comments. One country suggested a factor-based approach, which should take into account the specificities of structured credit. Undertakings in another proposed that the split by ratings should not be mandatory. Finally, one other proposed simplification was to stress the difference between the 'current value' and a value assuming the implicit credit spread (the difference between the internal rate of return and the current yield), plus a fixed percentage.

A few countries noted the duration of bonds as an area where a simplification would be appreciated (we note that there were also several questions in the QIS5 Q&A on how to properly account for the duration of bonds and other securities) and suggested that proxies be allowed, at least for floating rate bonds. Another country reported that in some cases spot rates had been used for floating rate notes, rather than forward rates.

Interest rate risk

A number of simplifications were also proposed in relation to interest rate risk. However this was not highlighted by many as a key area and at least one supervisor expressed the view that this sub-module was well within the capabilities of most undertakings.

Most proposals involved modified duration approaches rather than actual cash flow projections, some suggesting this only for unit-linked or externally managed investments or short-term assets. One country reported a participant applying a fixed rate to variable rate mortgages, and another suggested that the indexation of bonds be taken into account.

Currency risk

A few simplifications were suggested in relation to currency risk, including the aggregation of minor currencies into others, and a suggestion to conduct a single economically equivalent stress rather than stressing each currency individually.

Other

Other areas of market risk where it was suggested that simplifications might be useful included the application of the equity risk sub-module to convertible bonds, and that it should be possible to group assets by rating, duration or similar where this was proportionate.

Non-life underwriting risk

Non-life catastrophe

Another area that a number of countries cited as in need of simplifications was non-life catastrophe risk, with the CRESTA zone and 150/300m radius data requirements particularly noted as areas where this could be considered. A few countries suggested that national catastrophe scenarios should be developed and then split by market share. Another suggested that concentration scenarios should be based on postcodes rather than radii.

Other

It was reported that in relation to premium and reserve risk, in some cases premiums written were all considered to be already paid, even where this was not the case. There was also a suggestion that the non-life lapse risk should be calculated separately for annual and multi-year contracts.

Health catastrophe risk

There were a few suggestions from undertakings around health catastrophe, along the same lines as for non-life catastrophe:

- That the most granular level of postcode be used instead of a set radius;
- That a factor-based approach be used;
- That the three scenarios be replaced by a single catastrophe event that applies to all health insurance obligations;
- That minor countries could be aggregated together; and
- That a similar approach be used as with life catastrophe.

Life underwriting risk

Lapse risk

Several countries felt that simplifications could be introduced for lapse risk, particularly around the calculation of surrender strains and the policy-by-policy approach. Simplifications suggested were:

- Allowing the use of model points;
- Calculating the net positive and negative lapses rather than splitting by policy;
- Calculating lapse up and lapse down on all policies rather than working out the surrender strains; and
- Calculating surrender strain at product rather than policy level.

There was also a suggested simplification for mass lapse: that an expense stress be calculated instead using the increased expense costs for the remaining business if there were 30% fewer policies in place.

Other

One country suggested that disability could be calculated as a single shock instead of year by year. In a few countries undertakings suggested simplifications for the life underwriting sub-modules in general, such as the use of a zero floor at contract level for mortality and longevity, the removal of per-policy capping, and that the stresses could be calculated at product rather than policy level. There was also an undertaking which suggested the mortality/longevity split could be done by carrying out both stresses and applying the most onerous.

Other

A few countries suggested there should be simplifications available for small sub-portfolios, with a couple proposing that they could be aggregated with or approximated by a larger portfolio. One country suggested that non-life guarantees not be unbundled from life contracts.

In one country it was suggested that the calculation of geographical diversification could be omitted where this was not material. In another country it was suggested that operational risk could be calculated as a percentage of operating expenses.

Finally, it was proposed that where calculation at insured/contract level was easier than at group policy level, this should always be available as an option.

Adjustment for non-proportional reinsurance

Another area where simplifications were felt to be needed by several countries was the adjustment for non-proportional reinsurance. One suggested simplification was that the premium risk factors should be reduced by a factor based on non-proportional reinsurance claims recoveries divided by net claims (pre recoveries), averaged over 3-5 years. Another suggestion was that this should always be done as in the non-life catastrophe sub-module.

Adjustment for the loss absorbing capacity of technical provisions and deferred taxes

A number of countries commented that simplifications would be useful for the loss absorbing capacity of technical provisions, and usually suggested that deterministic proxy approaches be allowed.

A couple felt that this would be helpful for the deferred taxes adjustment as well, suggesting the use of an undertaking-specific average tax rate, or that this be calculated as the difference in the change in NAV for all risks on a pre and post-tax basis.