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June 2010



Report on the Possible Impact of the Likely Solvency II QIS5 Standard Formula on the European Life Market

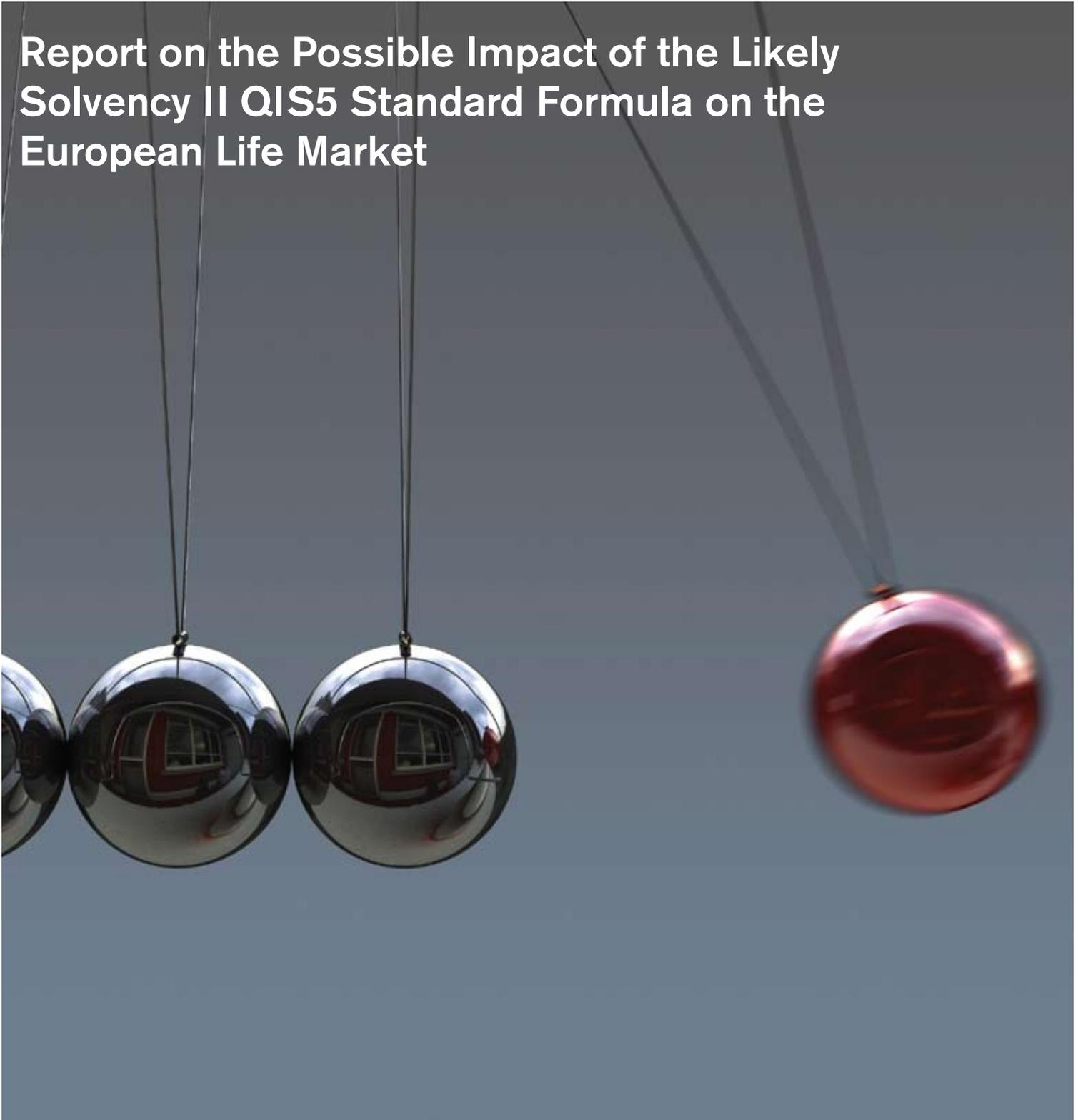




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A. INTRODUCTION

On 15 April, the European Commission (EC) published the draft technical specification for the fifth Solvency II Quantitative Impact Study (QIS5).

This provides a clear indication of how the standard formula is likely to be set for the QIS5 exercise.

Milliman has therefore carried out research into the impact of the draft QIS5 technical specification on solvency positions under the standard formula for the European life insurance market.

This research has been performed for a number of key European markets and this report presents the background, results, analysis, and conclusions.

B. OVERVIEW OF THE ANALYSIS

The analysis covered by this report was performed for the following European life insurance markets:

- Selected Central Western European (CWE) markets: France, Ireland, Italy, UK
- Selected Central Eastern European (CEE) markets: Poland, Romania, Slovakia

For each country included in our analysis we notionally created a life insurer (named *[Country] Life*) whose opening balance sheet (as at 31 December 2007) represents an accumulation of the data available on the life insurance market in that country as at that date.

The study has then considered the impact on the opening (QIS4) solvency position of each country's notional life insurer of the various changes likely to be implied by the new standard formula specification within the upcoming QIS5 exercise.

We performed this analysis taking into account both:

- (a) Developments in the economic and business environment over the period 31 December 2007 to 31 December 2008
- (b) Development of certain components of the QIS standard formula for calculation of the Solvency Capital Requirement (SCR) under Solvency II

For (b) we considered the development of certain key parameters of the standard formula inferred from our reading of the draft QIS5 technical specification. Section C of this report considers each of these in more detail.

Given the nature of this analysis and some uncertainty over the details of the final QIS5 technical specification, we note that the analysis is subject to several limitations, in particular:

- Most of the market data used in our analysis is based on publicly-available information (e.g., statutory accounts).
- The non-economic assumptions used are based on our knowledge of the market and were calibrated to reconcile our results as at 31 December 2007 with those published in respect to QIS4.
- We note that the analysis is based on the 2007 and 2008 year-end positions of European life insurers. We acknowledge that the QIS5 exercise will be based on the 2009 year-end but, at the time of writing, complete data for 2009 was not yet available.
- The methodologies used have been set by our team of consultants. Other, possibly very different, approaches could also have been considered.
- The main objective of the study is to consider the impact relative to a known initial situation (i.e., the solvency position under QIS4 as at 31 December 2007). Analysis of a figure taken in isolation could lead to incorrect interpretations.

Whilst we expect the main conclusions to remain valid, the results presented in this summary note should be therefore interpreted with the above points in mind. In particular, the results should not be taken as a prediction of the eventual QIS5 results for the markets in question.

The study has then considered the impact on the opening (QIS4) solvency position of each country's notional life insurer of the various changes likely to be implied by the new standard formula specification within the upcoming QIS5 exercise.

Moving from QIS4 to QIS5

Following the QIS4 exercise, the development of key aspects of Solvency II has been driven principally through the consultation process conducted by CEIOPS around the second half of 2009. The waves of consultation papers included many changes from QIS4 and hence represented an initial sketch of the likely QIS5 standard formula. The consultation papers were then followed by CEIOPS' Final Advice, which amended some of the initial proposals following stakeholder consultation.

The Final Advice represented the recommendations of CEIOPS to the European Commission for the QIS5 exercise, and in general implied a significant tightening of the calibration of the QIS standard formula. The Final Advice also introduced some significant restrictions on tiering of certain elements of eligible capital (for example, *expected future profits* was moved to Tier 3).

There was perhaps some justification for a tightening of the standard formula, given the effects of the global financial crisis, but in general strong industry concerns were raised at the scale of the uplift in capital requirements. The Final Advice was seen by some as excessive and straying from the economic/realistic principles underpinning Solvency II. Estimations carried out by Milliman as part of the present study confirmed the likelihood of significant falls in QIS solvency ratios across Europe, should the QIS5 exercise be based on CEIOPS' Final Advice.

The draft QIS5 technical specification was then published on 15 April 2010 by the European Commission, and has scaled down many of CEIOPS' proposals. Industry concerns have clearly been heeded but the QIS5 technical specification can still change, with the final version expected by July 2010.

The QIS5 exercise will then run from August to November 2010, with a report on the results due to be published by CEIOPS in April 2011.

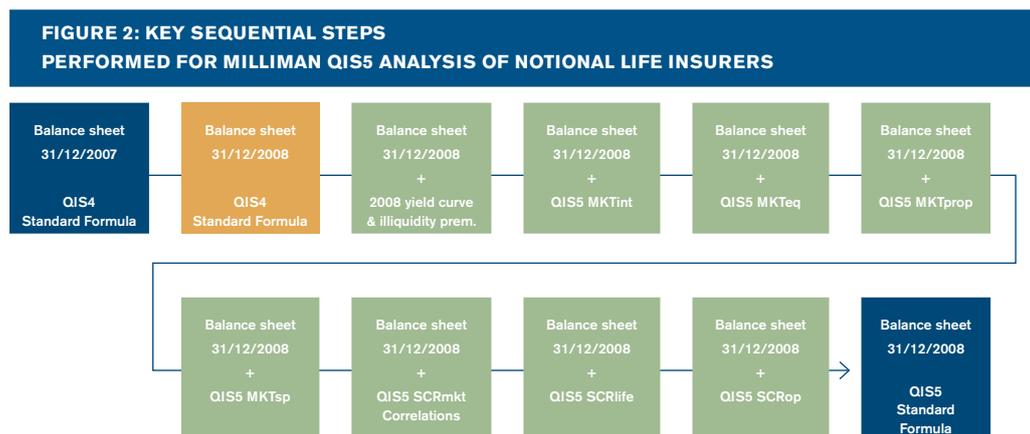
The table in Figure 1 summarises some of the main changes between the draft QIS5 technical specification and that for QIS4.

FIGURE 1: SUMMARY OF MAIN CHANGES BETWEEN DRAFT QIS5 TECHNICAL SPECIFICATION AND QIS4

	DRAFT QIS5 (COMPARED TO QIS4)
RISK-FREE RATES	Based on swap rates (adjusted for credit risk) Illiquidity premium introduced
MARKET RISK	Introduction of volatility shocks (equity, interest risk) Equity shock higher (but adjustment down introduced) Higher calibration of spread risk Higher correlation factors Different correlations depending on interest risk up/down shocks
LIFE UNDERWRITING RISK	Some tightening of shocks Correlations—small changes Separate aggregation of catastrophe risk
OPERATIONAL RISK	Factors have been raised
RISK MARGIN	Diversification between lines of business is now recognised
FUTURE PREMIUMS	'Symmetric' treatment (though still unclear in some cases)

Our study has not looked at all possible areas of difference between QIS4 and draft QIS5. Instead we have focused on certain key differences affecting the standard formula SCR and eligible capital. The flowchart in Figure 2 illustrates the specific steps that have been performed in the sequence of analysis for each country's notional life insurer:

Our study has not looked at all possible areas of difference between QIS4 and draft QIS5. Instead we have focused on certain key differences affecting the standard formula SCR and eligible capital.



We note that we have excluded the effect of the allowance for diversification between lines of business that the draft QIS5 specification has introduced with respect to the risk margin. This change may have a potentially significant impact compared to QIS4, but we believe further clarification is required on how the diversification is to be interpreted and applied.

A similar comment applies to the *symmetric* treatment now afforded to the projection of future premiums. The new treatment is in contrast to the proposals of CEIOPS that projection of premiums could effectively only be made where this would increase the best estimate liability value. This is a return to economic principles but the text of the current draft gives rise to some ambiguities and uncertainties around the application to certain life product modalities.

Section C of this report looks in more detail at the background to the steps of Figure 2.

The favoured choice by CEIOPS of government bond rates has been replaced with the use of swap rates that have been adjusted for credit risk.

C. SOME KEY DEVELOPMENTS IN THE DRAFT QIS5 TECHNICAL SPECIFICATION

C.1 Interest rate structure

The definition of risk-free rates introduced by the draft QIS5 technical specification represents a clear change in direction from CEIOPS' Final Advice. The favoured choice by CEIOPS of government bond rates has been replaced with the use of swap rates that have been adjusted for credit risk.

Furthermore, an allowance for an illiquidity premium adjustment is introduced. The methodology for this has been determined using an approach outlined by the CFO and CRO Forums, and allows for three levels of illiquidity premium: none, half, and full. These relate to a prescribed base level, and are set depending on the type of business:

- (Full) 100% of base illiquidity premium for immediate annuities that are non-surrenderable
- (None) 0% of base illiquidity premium for business with term of less than one year
- (Half) 50% of base illiquidity premium for everything else

The base illiquidity premium levels for the Euro yield curve are 53 basis points (as at 31 December 2009) and 179 basis points (as at 31 December 2008). Other base levels apply for alternative currencies.

There are then *cutoff* points after which the illiquidity premium must reduce linearly to zero over a period of five years, and these cutoff points will vary by currency (e.g., 15-year cutoff for EUR; 30-year cutoff for GBP).

In our study we have assumed that an illiquidity premium should not be applied to the unit-fund portion of best estimate liabilities in respect to unit-linked business.

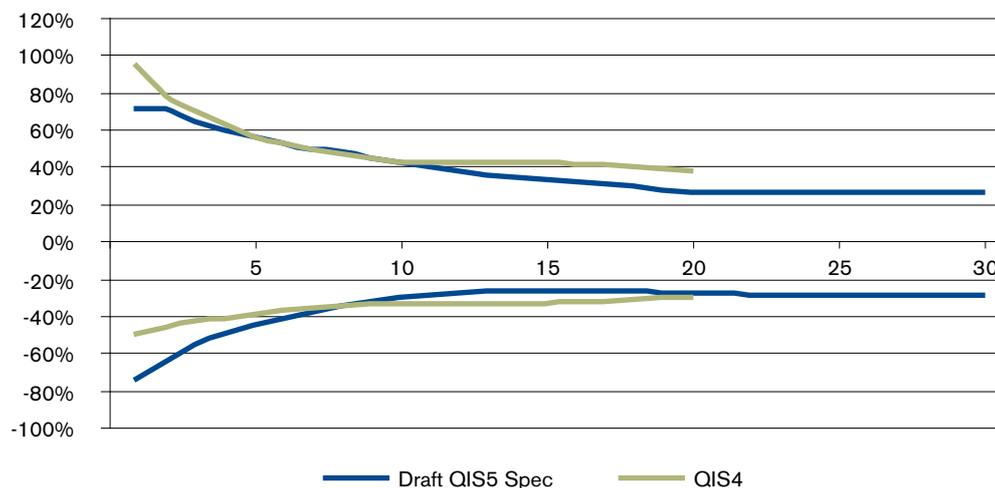
On a practical note, we would also point out that the introduction of the illiquidity premium now implies a significant increase in the amount of yield curve data required for carrying out the standard formula calculations.

C.2 Market risk module: Interest rate risk

Interest rate level shock

The draft QIS5 specification introduces changes in the up- and down-shocks applied to the initial yield curve. We have interpreted the text of the current draft as implying that the shocks are applied to the yield curve including the illiquidity premium, as this is not made explicit. The resulting shocks are shown in the graph in Figure 3, along with those used in QIS4. We note that there is also a requirement for a minimum of 100 basis points to be applied to the amplitude of the down-shock at all maturities.

FIGURE 3: INTEREST RATE RISK: UP- AND DOWN- SHOCKS, DRAFT QIS5 VS. QIS4



Interest rate volatility shock

The draft specification also introduces up- and down-shocks to implied interest rate volatility, as shown in the table in Figure 4. This is a new feature of the standard formula compared to the QIS4 technical specification.

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FIGURE 4: INTEREST RATE VOLATILITY SHOCKS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5
VOLATILITY UP-SHOCK	N/A	+12% (ADDITIVE)
VOLATILITY DOWN-SHOCK	N/A	-3% (ADDITIVE)
CORRELATION VOLATILITY/LEVEL	N/A	0%

Overall, calculation of the SCR in respect to interest rate risk requires carrying out the above four shocks individually and then aggregating each combination of level and volatility shocks assuming 0% correlation:

- A: Level up / volatility up
- B: Level up / volatility down
- C: Level down / volatility up
- D: Level down / volatility down

The higher of A and B is recorded as the MKTint(up) capital charge while the higher of C and D is taken as the MKTint(down) capital charge. A different correlation matrix then applies for each of MKTint(up) and MKTint(down) when the various market risk modules are aggregated to produce the market SCR.

There have also been changes to the amplitude of the equity market level shocks. In particular, a *symmetric adjustment* is included to alter the amplitude of the shock depending on the position of equity markets within the financial cycle, with aim of reducing procyclicality.

C.3 Market risk module: Equity risk

Equity market level shock

There have also been changes to the amplitude of the equity market level shocks. In particular, a *symmetric adjustment* is included to alter the amplitude of the shock depending on the position of equity markets within the financial cycle, with aim of reducing procyclicality.

As at the QIS5 valuation date (31 December 2009) the symmetric adjustment reduces the equity level shock by nine percentage points. In general the symmetric adjustment cannot alter the base shock level by more than ten percentage points.

These effects and the change from QIS4 are set out in Figure 5.

The *global* and *other* shocks are aggregated using a correlation factor of 75%.

FIGURE 5: EQUITY LEVEL SHOCKS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5 (BASE)	DRAFT QIS5 FOR YE2009
GLOBAL EQUITIES SHOCK	32%	39%	30%
OTHER EQUITIES SHOCK	45%	49%	40%

Equity volatility shock

As in the case of interest rate risk, up- and down-shocks to implied equity volatility have been introduced, as shown in the table in Figure 6.

FIGURE 6: EQUITY VOLATILITY SHOCKS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5
VOLATILITY UP-SHOCK	N/A	+10% (ADDITIVE)
VOLATILITY DOWN-SHOCK	N/A	-3% (ADDITIVE)
CORRELATION VOLATILITY/ LEVEL	N/A	75%

The higher of the volatility up- and down-shocks is then aggregated with the equity level shock result using a correlation factor of 75%.

C.4 Market risk module: Property risk

For property risk, a single level-shock coefficient is used, which has increased from 20% in QIS4 to 25% in the draft QIS5 technical specification.

FIGURE 7: PROPERTY SHOCKS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5
PROPERTY SHOCK	20%	25%

C.5 Market risk module: Spread risk

Following the global financial crisis, the parameters of the spread risk sub-module have been significantly revised.

For **bonds**, the spread risk sub-module has seen several notable modifications when compared with QIS4, although the exemption for bonds issued by EEA/OECD governments in their own currency has been maintained.

The effects of both a narrowing and a widening of credit spreads are now considered, and these effects are represented through factors that are set considerably higher than in QIS4, as illustrated for some example bonds in the table in Figure 8. In addition, the spread shocks are also applied to the illiquidity premium used for certain liabilities, and the resulting change in liability value is allowed to mitigate the effect on the bond portfolio.

The effects of both a narrowing and a widening of credit spreads are now considered, and these effects are represented through factors that are set considerably higher than in QIS4.

FIGURE 8: SPREAD RISK MODULE: EXAMPLE STRESS FACTORS FOR WIDENING SPREADS

	QIS4	DRAFT QIS5
AAA-RATED BOND, 5-YEAR MATURITY	1.2%	5.0%
A-RATED BOND, 4-YEAR MATURITY	4.1%	10.4%
BB-RATED BOND, 3-YEAR MATURITY	10.2%	25.2%

For **structured credit** products (e.g., asset-backed securities, CDOs), the calculation of the capital requirement now takes into account the attachment/detachment points of each tranche and a recovery rate.

For **credit derivatives** (e.g., CDS, TRS, CLN) that are not part of risk mitigation, a stronger widening of credit spreads is tested: 600% stress, compared with 300% under QIS4. However, the narrowing of credit spreads is unchanged at 75%.

The draft QIS5 spread risk module also introduces a capital charge related to **exposures secured by property** (mortgages), with separate risk weights for residential and commercial property.

C.6 Correlations

The correlation of interest rate risk with property, equity, and spread risks now depends on the direction of the rate risk shock: the interest rate down-shock is 50% correlated with these risks, while the interest rate up-shock has a 0% correlation with these risks, as illustrated in Figure 9.

FIGURE 9: MARKET RISK CORRELATIONS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5
EQUITIES / INTEREST RATES	0%	50% / 0%
EQUITIES / SPREAD	25%	75%
PROPERTY / SPREAD	25%	50%
PROPERTY / INTEREST RATES	50%	50% / 0%
SPREAD / INTEREST RATES	25%	50% / 0%

The draft QIS5 specification increases the calculation base (for premiums and technical provisions) for portfolios with strong growth, and there is also a strengthening of the coefficients applied to earned premiums and technical provisions.

C.7 SCR operational risk

The structure of the formula for calculating the capital charge in respect to operational risk has not changed from QIS4. However, the draft QIS5 specification increases the calculation base (for premiums and technical provisions) for portfolios with strong growth, and there is also a strengthening of the coefficients applied to earned premiums and technical provisions, as shown in Figure 10.

FIGURE 10: OPERATIONAL RISK FACTORS, DRAFT QIS5 VS. QIS4

	QIS4	DRAFT QIS5
EARNED PREMIUMS COEFFICIENT	3.0%	4.0%
TECHNICAL PROVISIONS COEFFICIENT	0.3%	0.45%

C.8 Eligible own funds

The new draft QIS5 rules on the classification into tiers of own funds instruments have tightened the conditions for Tier 1 and Tier 2 eligibility with respect to QIS4.

A summary of the main limits applying to the tiering are:

- Tier 1 > Tier 2 > Tier 3
- Tier 1 \geq 50% SCR
- Tier 3 < 15% SCR

We note that the draft QIS5 technical specification expresses these limits with reference to the SCR, whereas CEIOPS' Final Advice used *eligible own funds*, which can represent a potentially significant difference.

Subordinated debt

In order for subordinated debt not to be classified as Tier 3, there is a requirement for the absence of an incentive to redeem. In Europe, subordinated debt arrangements commonly have a *step-up* clause, which effectively prevents them from being classified as Tier 1. This aspect has potentially significant implications for the eligibility of subordinated debt, and we can perhaps foresee a significant increase in the cost of issuing debt if insurers wish to achieve Tier 1 classification. Furthermore, potential distortion of competition with the banking sector, for which Tier 1 conditions are more flexible, could be introduced by these restrictions.

Expected future profits

In CEIOPS' Final Advice, expected future profits were classed as Tier 3. However, CEIOPS did not define what it meant by *expected future profits* in a realistic reporting framework. In the draft QIS5 specification, expected future profits has effectively been re-classified as Tier 1 via the introduction of a *reconciliation reserve*.

This remains a point of much debate. Expected future profits is normally a concept associated with prudent statutory reserves. For example, in an embedded value framework, expected future profits represents the release of prudent reserves over time. Furthermore, expected future profits is often viewed as an intangible asset, and debate continues over its loss-absorbing capacity. Future potential changes in treatment of this aspect could significantly impact the level of eligible capital under Solvency II. We note that whether future profits can exist would tend to depend on whether local statutory accounting is changed, however there does not appear to be a uniform view between different member countries on this point.

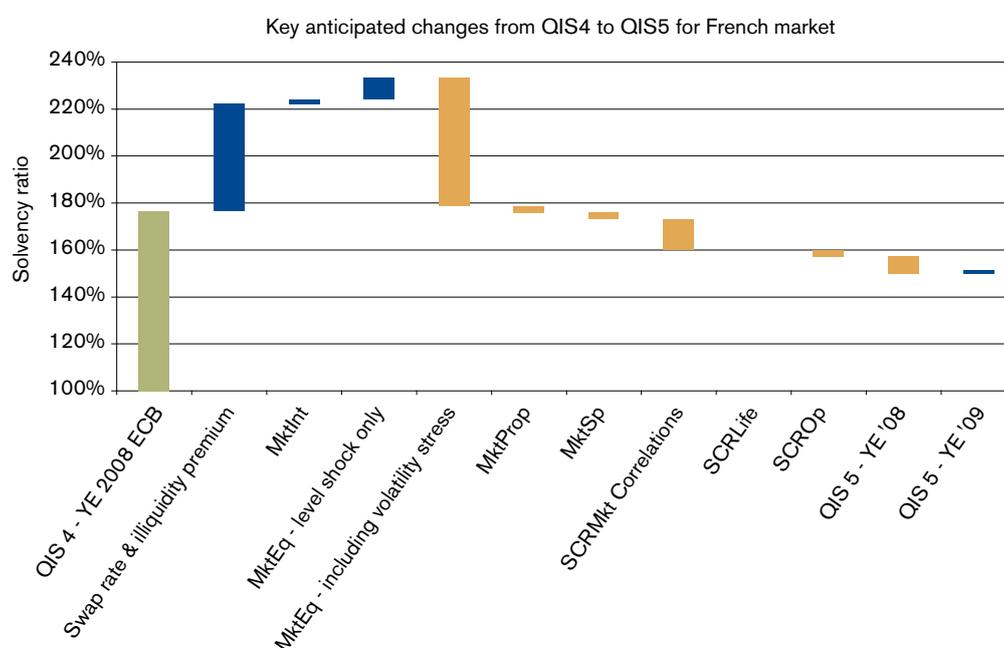
D. HIGHLIGHTS OF THE ANALYSIS: CWE MARKETS (FRANCE, IRELAND, ITALY, UK)

D.1 Highlights of the French market analysis

The QIS4 solvency ratio of the notional life insurer France Life as at 31 December 2008 was 172%.

The chart in Figure 11 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for France Life to that as at 31 December 2009 under the likely QIS5 standard formula specification.

**FIGURE 11:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON FRANCE LIFE SOLVENCY RATIO**



Some key observations arising from the analysis are:

- There is a significant impact from the use of a swap rates (including illiquidity premium) instead of ECB rates.
- The move to the likely QIS5 market risk specification has a significant impact, in particular on the equity risk module and overall correlations.
- At an individual company level, the impact of the Tier 3 restrictions will depend heavily on the proportion of subordinated debt that can be classified in Tier 1 or 2.

Conclusion

Our study suggests that the EC's proposals will mean a likely decline in the QIS standard formula solvency ratios observed for the French life market. However this decline is expected to be of less importance than CEIOPS's proposal, as described in the Final Advice.

Our study shows that the EC's proposals will mean a likely decline in the QIS standard formula solvency ratios observed for the French life market. However this decline is expected to be of less importance than CEIOPS's proposal.

In particular, the decline has turned out to be less severe than that implied by CEIOPS' Final Advice given an increase of own funds from the change in risk-free rates (from ECB to swap rates) and also due to the inclusion of an illiquidity premium. From QIS4 to QIS5 (YE 2008), the solvency ratio decreased by 12 percentage points while the amount of SCR required increased by 30 percentage points.

D.2 Highlights of the Irish market analysis

The QIS4 solvency ratio of the notional life insurer Ireland Life as at 31 December 2007 was 243%. This is lower than the observed QIS4 position of 279% published by the Financial Regulator (FR) in Ireland for the Irish life market. We put this difference down to (a) the incomplete participation in the FR's study (74.1% of market share), and (b) the presence of reinsurers in the FR's figure.

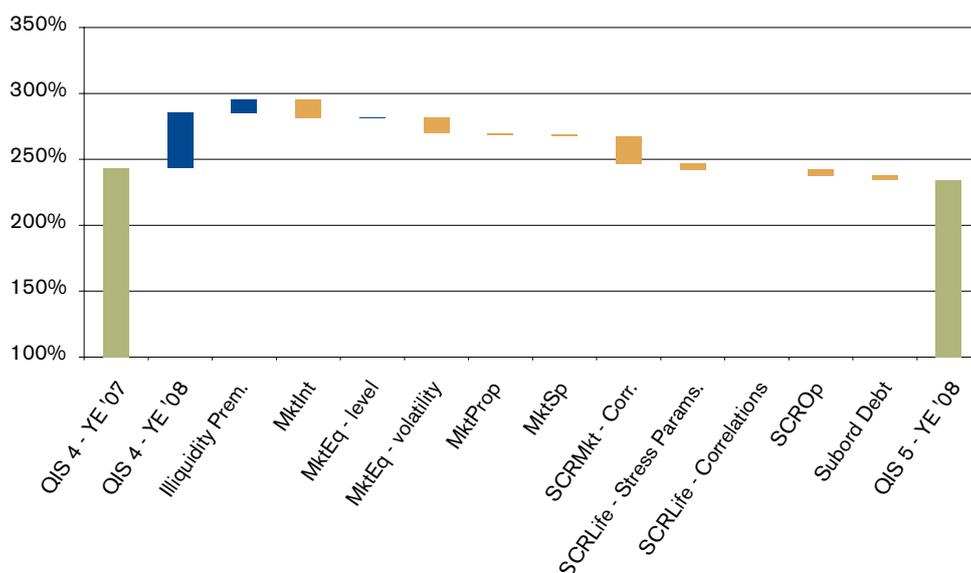
Figure 12 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for Ireland Life to that as at 31 December 2008 under the draft QIS5 standard formula specification.

Under the QIS4 parameterisation, the solvency ratio for 31 December 2008 increased from 243% to 285%. This is mainly due to the significant change in balance sheet composition from 2007 to 2008. Incorporating the changes found in the draft QIS5 technical specification led to a fall in solvency to 235%. This illustrates and confirms an overall strengthening of the standard formula specification (although this has been scaled back in some respects from the proposals of CEIOPS's Final Advice).

Some key observations arising from the analysis are:

- Surprisingly, the solvency position of Ireland Life improved from 2007 to 2008. This reflects a significantly more robust balance sheet at year-end 2008.
- Less surprisingly, the inclusion of an illiquidity premium in the valuation of best estimate liabilities has a positive impact on the Solvency II balance sheet.
- The overall strengthening in the individual market sub-modules leads to a significant fall in the estimated solvency ratio. This is driven mainly by the introduction of the stresses to volatility for interest rates and equity and the changes to the market correlations.
- There were also changes to the sub-modules used to stress mortality and disability risk in the life underwriting component of the SCR, but these were not significant for our sample company.
- Similarly the SCR in respect to operational risk is somewhat more conservative under QIS5, although the relative impact is not significant.
- The restrictions on eligible subordinated debt (assumed to be restricted to 20% of eligible own funds for the purposes of demonstrating solvency) had a small negative impact on our sample company's solvency ratio. This may be more significant for some companies.

**FIGURE 12:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON IRELAND LIFE SOLVENCY RATIO**



Conclusion

Our study suggests that the draft technical specification for QIS5 is likely to mean a decline in the QIS standard formula solvency ratios observed for the Irish life market as a whole, which is due to an overall strengthening of the stresses applied to calculate the SCR more than outweighing the effect of uplifted risk-free rates.

However, the impact of the change to the market stresses would have been even more significant had the analysis been conducted at year-end 2007. The significant reduction in equities and low-rated bonds held (in both shareholder and policyholder funds) at year-end 2008 means that the impact of the changes to the equity and spread sub-modules in particular would have been much larger at year-end 2007.

D.3 Highlights of the Italian market analysis

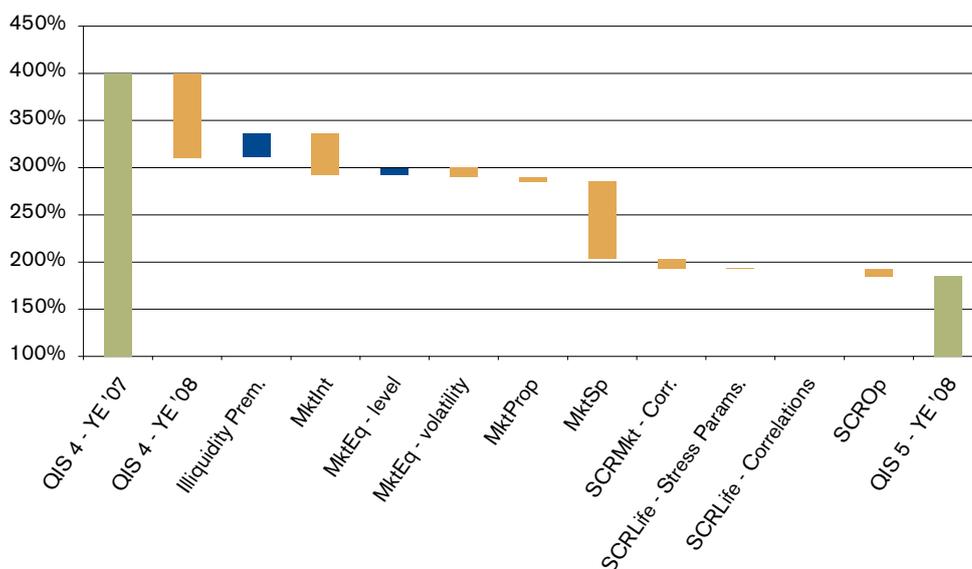
The QIS4 solvency ratio of the notional life insurer Italy Life as at 31 December 2007 was 400%, in line with the observed QIS4 position published by CEIOPS for the Italian life market (based on the QIS4 participants).

The chart in Figure 13 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for Italy Life to that as at 31 December 2008 under the draft QIS5 standard formula specification.

Under the QIS4 parameterisation the solvency ratio for 31 December 2008 declines from 400% to 311%, as a result of the significant market falls observed over 2008. Incorporating the changes found in the draft QIS5 technical specification leads to a further marked fall in the estimated solvency position to 185%. This illustrates and confirms an overall tightening of the standard formula specification (although this has been scaled back in some respects from the proposals of CEIOPS's Final Advice).

Our study shows that the draft technical specification for QIS5 is likely to mean a decline in the QIS standard formula solvency ratios observed for the Irish life market as a whole, which is due to an overall strengthening of the stresses applied to calculate the SCR more than outweighing the effect of uplifted risk-free rates.

FIGURE 13:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON ITALY LIFE SOLVENCY RATIO



Some key observations arising from the analysis are:

- As expected, the global financial crisis has clearly impacted Italy Life, as can be seen by the reduced solvency position one year after the QIS4 exercise as at 31 December 2007.
- The inclusion of an illiquidity premium in the valuation of best estimate liabilities has a positive impact on the Solvency II balance sheet. The large volume of participating business present within the Italian market benefit because their valuation can take credit for 50% of the illiquidity premium.
- Despite a slight weakening in the stress to equity levels (after allowing for the symmetric adjuster effect), the overall strengthening in the individual market sub-modules leads to a significant fall in the estimated solvency ratio (particularly in the case of the interest and spread risk sub-modules).
- There were also changes to the sub-modules used to stress mortality and disability risk in the life underwriting component of the SCR, but after allowing for diversification effects these were not significant for Italy Life.
- Similarly the SCR in respect to operational risk is somewhat more conservative under QIS5 but does not represent a significant change overall.

Conclusion

Our study suggests that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed for Italian life companies, which results from an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of uplifted risk-free rates.

The study also suggests how this picture of declining QIS solvency has been exacerbated by the effects of the global financial crisis, with a significant fall from the year-end 2007 QIS4 levels.

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D.4 Highlights of the UK market analysis

The QIS4 solvency ratio of the notional life insurer UK Life as at 31 December 2007 was 134%, in line with the observed QIS4 position published by CEIOPS and the FSA for the UK life market.

The chart in Figure 14 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for UK Life to that as at 31 December 2008 under the draft QIS5 standard formula specification.

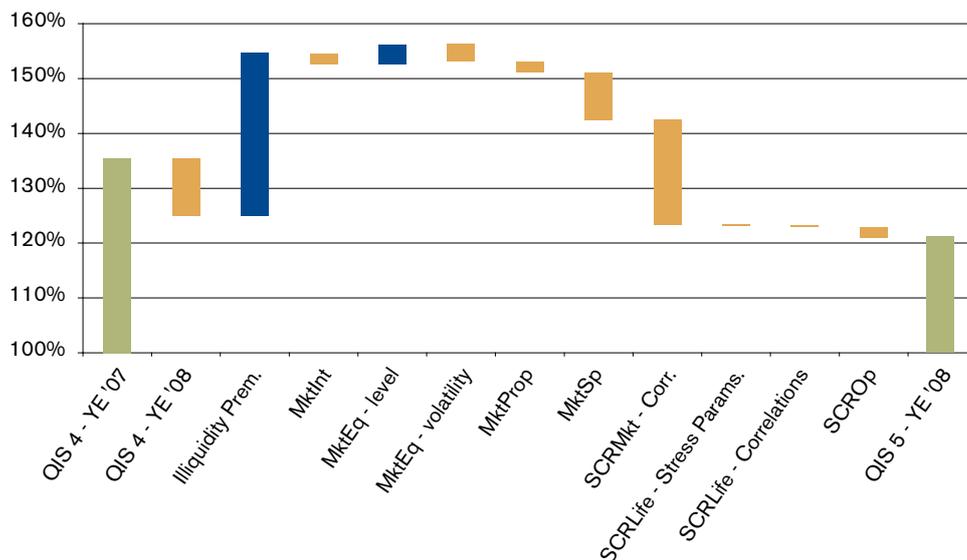
Under the QIS4 parameterisation the solvency ratio for 31 December 2008 declined from 134% to 125% as a result of the significant market falls observed over 2008. Incorporating the changes found in the draft QIS5 technical specification led to a further fall in solvency to 121%. This illustrates and confirms an overall tightening of the standard formula specification (although this has been scaled back in some respects from the proposals of CEIOPS's Final Advice).

Some key observations arising from the analysis are:

- As expected, the global financial crisis has clearly impacted UK Life, as can be seen by the reduced solvency position one year after the QIS4 exercise as at 31 December 2007.
- The inclusion of an illiquidity premium in the valuation of best estimate liabilities has a significant impact on the Solvency II balance sheet. The large immediate annuity portfolios present within the UK market benefit considerably because their valuation can take credit for 100% of the illiquidity premium, but other business (except very short-term contracts) can also benefit from 50% of this premium.
- Despite a slight weakening in the stress to equity levels (after allowing for the dampener effect), the overall strengthening in the individual market sub-modules leads to a significant fall in the estimated solvency ratio. This is driven mainly by the introduction of the stresses to volatility for interest rates and equity and the change to the credit spread sub-module, which now also captures a change in illiquidity premium.
- In our analysis, the benefit from the introduction of the illiquidity premium is then further diminished by the strengthening in the correlation coefficients used to aggregate the individual components of the market risk module.
- There were also changes to the sub-modules used to stress mortality and disability risk in the life underwriting component of the SCR, but after allowing for diversification effects these were not significant for our sample company.
- Similarly the SCR in respect of operational risk is somewhat more conservative under QIS5, but does not represent a significant change overall.
- Whilst the classification of a portion of subordinated debt as Tier 3 capital had no impact on our sample company's solvency ratio, the restriction to 15% of eligible own funds for the purposes of demonstrating solvency under the new regime may be significant for some companies.

The large immediate annuity portfolios present within the UK market benefit considerably because their valuation can take credit for 100% of the illiquidity premium, but other business (except very short-term contracts) can also benefit from 50% of this premium.

FIGURE 14: IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON UK LIFE SOLVENCY RATIO



Conclusion

Our study suggests that the draft technical specification for QIS5 is likely to mean a decline in the QIS standard formula solvency ratios observed for UK life companies, which is due to an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of uplifted risk-free rates.

The study also suggests how this picture of declining QIS solvency has been exacerbated by the effects of the global financial crisis, with a fall from the year-end 2007 QIS4 levels.

Our analysis also appears to confirm that the year-end 2008 UK Life balance sheet, while looking worse under QIS5 than QIS4, seems to have been structured rather more robustly than that as at year-end 2007, which according to our calculations would have shown much worse solvency under QIS5 when compared to QIS4.

Interestingly, our analysis also appears to confirm that the year-end 2008 UK Life balance sheet, while looking worse under QIS5 than QIS4, seems to have been structured rather more robustly than that as at year-end 2007, which according to our calculations would have shown much worse solvency under QIS5 when compared to QIS4.

E. HIGHLIGHTS OF THE ANALYSIS: CEE MARKETS (POLAND, ROMANIA, SLOVAKIA)

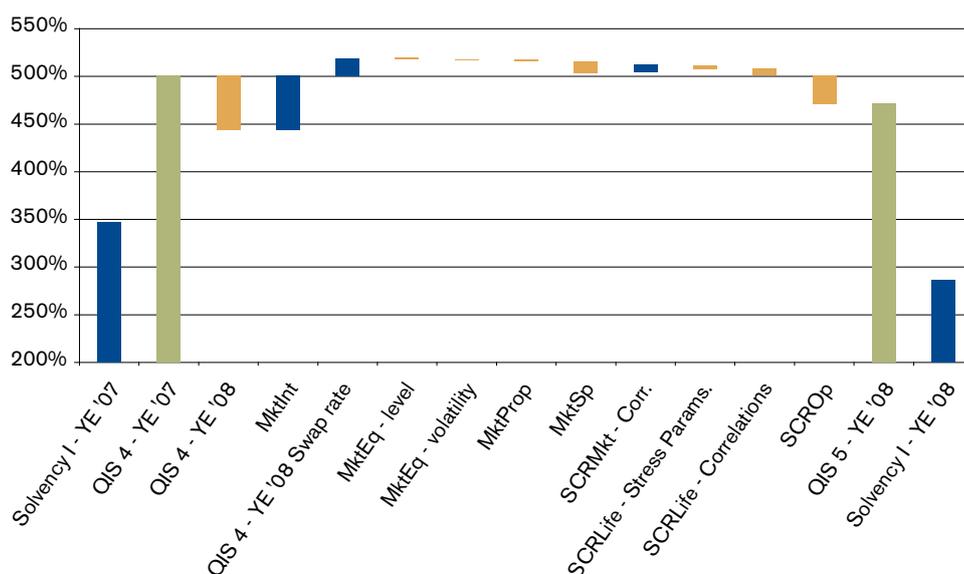
E.1 Highlights of the Polish market analysis

The QIS4 solvency ratio of the notional life insurer Poland Life calculated as at 31 December 2007 was approximately 500%, in line with the observed QIS4 position published by CEIOPS and the Financial Supervisory Authority (KNF) for the Polish life market. The Solvency I ratio for year-end 2007 was 347%, in line with figures for other CEE markets, where Solvency I requirements are more onerous than those under QIS4. Compared to the CWE countries in the study, we observe that the CEE solvency ratios are high given the material element of expected future profits coming from significant portfolios of regular premium business.

The chart in Figure 15 illustrates the relative changes observed in the process of moving from this base QIS4 solvency position for Poland Life to that as at 31 December 2008 under the draft QIS5 standard formula specification.

Under the QIS4 specification, the solvency ratio dropped over 2008 by 57 percentage points to 443% as at 31 December 2008. This was mainly a result of the fall in financial markets and an increase in sales of less profitable savings products (such as single premium endowments) over the year. The changes between QIS4 and the draft QIS5 technical specification have then led to a minor increase in the solvency ratio to 472%. The results show that despite an overall tightening of the standard formula specification (although this has been scaled back in some aspects from CEIOPS' original Final Advice) it seems that the changes do not have a major impact on the solvency position of Poland Life.

FIGURE 15:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON POLAND LIFE SOLVENCY RATIO



Some key observations from the analysis are:

- Overall life market solvency ratio as measured by Poland Life dropped from 2007 to 2008 under both Solvency I and QIS5.
- The change from risk-free rates based on government bonds to rates based on swaps, together with the inclusion of an illiquidity premium, resulted in a major decrease in available capital and solvency ratio (by 57 percentage points). The SCR interest rate charge decreased due to the transition to swap rates as compared to the use of government bond yields.
- Of the interest rate up- and down-shocks, the former is the one that bites for Poland Life and hence leads to application of the lower set of market risk correlations, leading to a decrease in total SCR(market).
- There were also some changes to the risk sub-modules that stress mortality and disability risks within the life underwriting component of the SCR. However, the total effect of these changes was insignificant after allowance for diversification effects.
- A more conservative SCR in respect of operational risk under QIS5 than under QIS4 resulted in a decrease of 29 percentage points in the solvency ratio.

Conclusion

Our study indicates that the draft technical specification for QIS5 would not be likely to imply a significant decrease in the solvency position of Polish life companies, despite a general tightening of the standard formula specification.

The study also suggests that despite this strengthening of the standard formula solvency specifications, the Polish life market appears to remain in a comfortably healthy solvency position.

The study also suggests that despite this strengthening of the standard formula solvency specifications, the Polish life market appears to remain in a comfortably healthy solvency position. For highly-profitable (in terms of in-force value) Polish insurers, the Solvency II requirements as described in the QIS5 specification actually improve the solvency ratio compared to the year-end 2008 Solvency I ratio.

E.2 Highlights of the Romanian market analysis

The QIS4 solvency ratio of the notional life insurer Romania Life as at 31 December 2007 was 505%, while the Solvency I ratio for year end 2007 was 385%. This is in line with observations made in other CEE markets, where Solvency I requirements are in fact more onerous at the moment than those under QIS4.

The chart in Figure 16 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for Romania Life to that as at 31 December 2008 under the draft QIS5 standard formula specification.

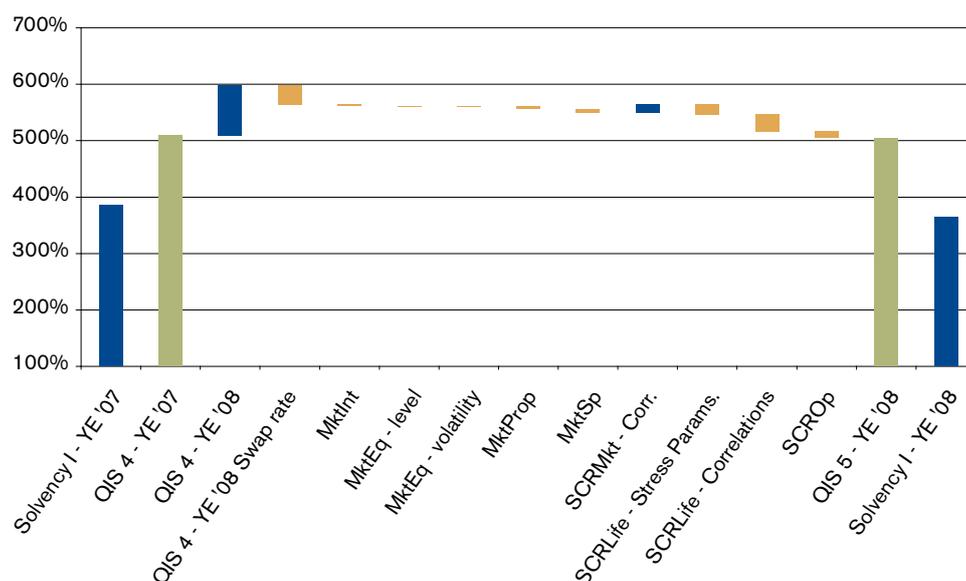
Under the QIS4 parameterisation the solvency ratio for 31 December 2008 increased by 90 percentage points to 600% as a result of the significant increases in share capital over 2008. Incorporating the changes found in the draft QIS5 technical specification led to a fall in solvency almost to levels observed as at the end of 2007–509%. This illustrates and confirms an overall tightening of the standard formula specification (although this has been scaled back in some respects from the proposals contained in CEIOPS's Final Advice).

Some key observations arising from the analysis are:

- The rise in share capital of many life insurers increased the available solvency margin under Solvency I by more than 40% and led to a significant increase in the QIS4 solvency ratio (dark blue bar). However, the more onerous stress parameters of the proposed QIS5 study resulted in a fall in solvency margins to the levels of 2007.

- While traditional endowment liability sensitivity for downside risk is much higher than the corresponding asset sensitivity, bond asset values are twice as large as the corresponding best estimate liability (BEL) for this product line. As a result of this, the increase in market yields is the more onerous shock for the insurer. Application of new market risk correlations, therefore, acts to decrease the overall SCR in respect of market risk.
- There were also changes to the sub-modules used to stress mortality and disability risk in the life underwriting component of the SCR. Mortality stress had significant impact on the solvency ratio because of the large exposure to mortality risk for credit life business. In addition, the new aggregation of life risks decreased the solvency ratio even further because of the significant share of life catastrophe risk for credit life business. The total impact was a decrease of the solvency ratio by 50 percentage points.
- Similarly the SCR in respect to operational risk is somewhat more conservative under QIS5 but does not represent a significant change, with only an 11% point fall in the solvency ratio.

FIGURE 16:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON ROMANIA LIFE SOLVENCY RATIO



Conclusion

Our study suggests that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed for Romanian life companies, which is due to an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of the increases in share capital and higher risk-free rates.

The study also suggests that despite this strengthening of the standard formula specifications, the Romanian market appears to remain in a comfortable solvency position. Solvency II requirements for highly-profitable Romanian insurers actually act to decrease capital requirements as can be seen by comparing the year-end 2008 Solvency I ratio with that estimated for QIS5.

Solvency II requirements for highly-profitable Romanian insurers actually act to decrease capital requirements as can be seen by comparing the year-end 2008 Solvency I ratio with that estimated for QIS5.

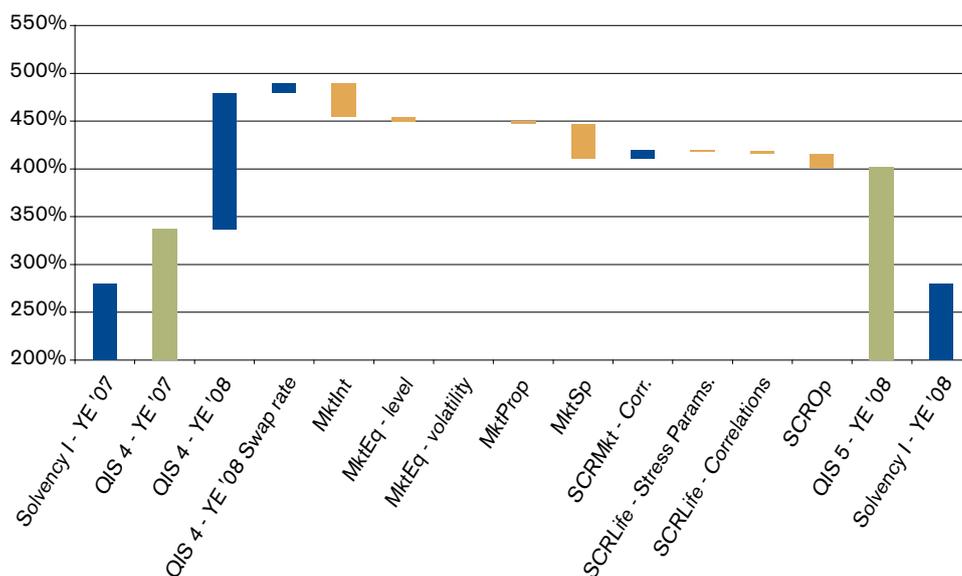
E.3 Highlights of the Slovakian market analysis

The QIS4 solvency ratio of the notional insurer Slovakia Insurance as at 31 December 2007 was 337%, which is broadly consistent with the observed QIS4 position published by CEIOPS and the National Bank of Slovakia for the Slovakian insurance market.

The chart in Figure 17 illustrates the relative changes observed in the process of moving stepwise from this base QIS4 solvency position for Slovakia Insurance to that as at 31 December 2008 under the draft QIS5 standard formula specification.

Under the QIS4 parameterisation the solvency ratio as at 31 December 2008 increased to 480%, which is largely attributable to “an increase in funds that are not subject to liabilities arising from insurance”¹. While the impact of moving from government bonds to swap rates as the interest rate basis has contributed to a slightly higher solvency ratio, other changes to the draft QIS5 technical specification led to an overall fall in solvency ratio to 402%. This illustrates and confirms an overall tightening of the standard formula specification (although this has been scaled back in some respects from the proposals of CEIOPS’ Final Advice).

**FIGURE 17:
IMPACT OF THE DRAFT QIS5 TECHNICAL SPECIFICATION ON SLOVAKIA LIFE SOLVENCY RATIO**



the increase in solvency ratio during 2008 under QIS4 is largely attributable to “an increase in funds that are not subject to liabilities arising from insurance”². However, the more onerous stress parameters of the proposed QIS5 standard formula resulted in a drop in the solvency ratio from QIS4 to QIS5.

Some key observations arising from the analysis are:

- As mentioned above, the increase in solvency ratio during 2008 under QIS4 is largely attributable to “an increase in funds that are not subject to liabilities arising from insurance”². However, the more onerous stress parameters of the proposed QIS5 standard formula resulted in a drop in the solvency ratio from QIS4 to QIS5. The drop in the solvency ratio that is due to the introduction of the new QIS5 parameterisation was not enough to offset the positive effect of the increase in own funds, with the QIS5 year-end 2008 solvency ratio being 402%, versus 337% under QIS4 as at the end of 2007.

¹ Based on statement made by Slovakia National Bank

² Based on statement made by Slovakia National Bank

-
- Changes to the SCR interest rate module resulted in the up-shock biting for insurers, largely driven by the impact on traditional participating business. This resulted in a reduction of 35 percentage points in the solvency ratio, although this impact was offset by the application of the lower set of market risk correlations.
 - Introduction of new parameters for calculation of spread risk had a major effect on the solvency ratio. Significant investments in corporate bonds resulted in a decrease of the solvency ratio of almost 37 percentage points, posing the most onerous change to QIS5 specifications for Slovakian insurers.
 - There were also changes to the sub-modules used to stress mortality and disability risk in the life underwriting component of the SCR, but after allowing for diversification effects these were not significant for our sample company.
 - Similarly the SCR in respect to operational risk is somewhat more conservative under QIS5 but does not represent a significant change.

Conclusion

Our study suggests that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed for Slovakian insurance companies, the result of an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of an increase in share capital and increased risk-free rates.

The study also suggests that despite the strengthening of QIS5 solvency specifications, the Slovakian market remains in a comfortable healthy solvency position. Solvency II requirements for highly-profitable Slovakian insurers actually act to improve solvency ratios, as can be seen by comparing the year-end 2008 Solvency I ratio with the estimated QIS5.

Our study shows that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed for Slovakian insurance companies, the result of an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of an increase in share capital and increased risk-free rates.

F. CONCLUSION

As described earlier in this report, our analysis has aimed to illustrate the possible effect of developments in the QIS5 specification on a set of hypothetical life insurers, each constructed to represent the life market of a selected European country. Our analysis has focused on certain key differences between QIS4 and the draft QIS5 technical specification which affect the standard formula SCR and eligible capital.

Our study shows that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed across European life markets, as compared to QIS4.

Our study suggests that the draft technical specification for QIS5 will likely mean a decline in the QIS standard formula solvency ratios observed across European life markets, as compared to QIS4. This is due to an overall strengthening of the stresses applied to calculate the SCR outweighing the effect of uplifted risk-free rates.

We note, however, that this conclusion may not necessarily apply across all European markets, with sensitivities to distinct aspects of the standard formula clearly varying between countries. Our analysis provides a good example of this, with the suggested increase in the solvency ratio of Poland Life compared to QIS4. However we should be careful to note the chosen make-up of each notional life insurer and its sensitivity to specific circumstances (e.g. in the case of Poland Life, the definition of risk-free rates).

In general it is important to note that this formulation is not necessarily typical of any specific life company in any of the countries analysed and that the likely effect on a company's solvency ratio will vary depending on the specific circumstances of each life insurer. Furthermore, some features that might have an important effect on individual companies may not have been picked up for our whole-market company.

The study also suggests how this picture of declining QIS solvency has been exacerbated by the effects of the global financial crisis, with a fall from the year-end 2007 QIS4 levels.

We expect debate to continue for some time around many aspects of Solvency II, both quantitative and qualitative. As a result, there will undoubtedly be further changes to the requirements before the new regime is fully implemented.

In particular, our analysis has highlighted a number of key areas where the draft QIS5 technical specification is still rather subjective.

In particular, our analysis has highlighted a number of key areas where the draft QIS5 technical specification is still rather subjective. These will likely lead to a variety of distinct interpretations and approaches, giving rise to potentially significant differences in standard formula results.

We recommend that such areas of subjectivity be addressed prior to publication of a final standard in order to avoid a situation where solvency levels are effectively rendered incomparable and inconsistent.

APPENDIX

Acknowledgements

This report could not have been possible without the significant effort of many Milliman consultants and offices across the globe. We would especially like to thank the following for their contributions to the project and this report:

Adrian Allott
Aldo Balestreri
Takanori Hoshino
Luca Inserra
Andrew Kay

Bruce Keenan
Marcin Krzykowski
Aisling Lovett
Ed Morgan
Sam Morgan

Olexander Ofutin
Eric Serant
Fred Vosvenieks
Henny Verheugen

We would also like to thank Steve Conwill, Toshiyuki Ikuma, and Denny Stanley for support and direction during the project.

Additional thanks to the Corporate Marketing and Communications team in Seattle for their support in the production of this report.



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