

Hong Kong RBC – Second Quantitative Impact Study results and observations

Introduction

The Second Quantitative Impact Study (QIS 2) was conducted by the Hong Kong Insurance Authority (IA) in late 2018 as an important step in the journey towards full adaptation of its new risk-based capital regime (HKRBC). All of the composite and long term insurance companies invited by the IA to take part in QIS 2, submitted results. The IA has released the results summary and key findings from the QIS 2 exercise to the Industry Focus Group (IFG) for Pillar 1 – Long Term Business for participants to provide feedback.

In this e-Alert, we set out highlights from the QIS 2 long term business results, and provide commentary on key components affecting solvency ratios. We end with our views on the next steps insurance companies could take before the next quantitative impact study, QIS 3.

Key points of focus:

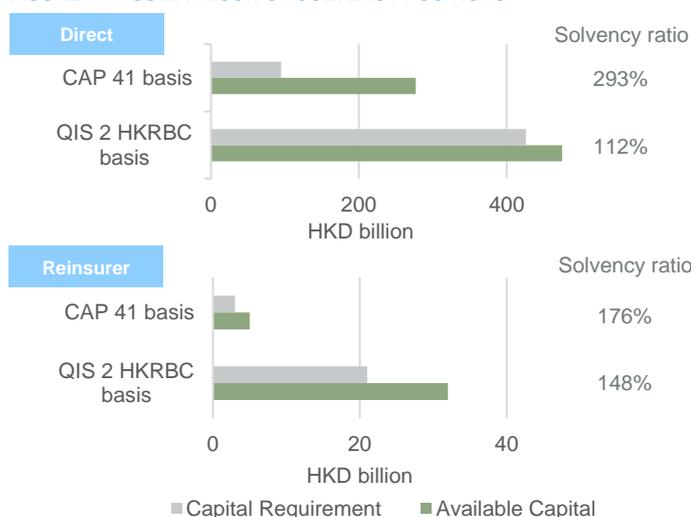
- Solvency ratios for the industry under QIS 2 and key drivers
- MOCE and TVOG
- Impact from the choice of discount rate
- Key lessons learnt from QIS 2

QIS 2 Results

INDUSTRY SOLVENCY RATIO

The aggregate solvency ratio for the 43 long term business participants dropped significantly when moving from the current regulatory basis (CAP 41 basis) to the proposed QIS 2 HKRBC basis. For direct life insurers, the average solvency ratio reduced from 293% to 112%. Life reinsurers reported a lower reduction, from 176% to 148%.

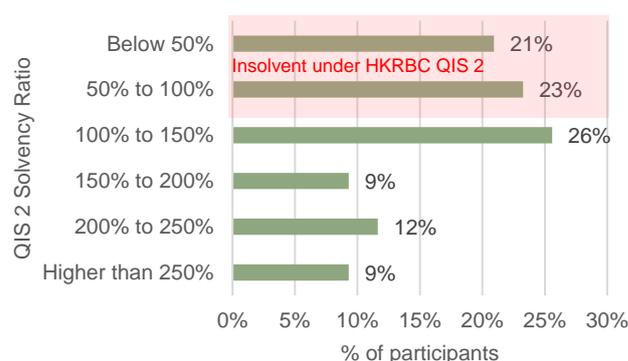
FIGURE 1: COMPARISON OF SOLVENCY POSITIONS



There are 19 participants (44% of total) with solvency ratios below 100%; a level that would normally prompt regulatory intervention.

The distribution of QIS 2 solvency ratios for long term business participants is shown in Figure 2. Whilst there are many companies with solvency ratios below 100%, there are 9 companies (21%) with solvency ratios above 200%.

FIGURE 2: DISTRIBUTION OF QIS 2 SOLVENCY RATIOS



Overall, the drop in solvency ratios is mainly explained by the material increase in capital requirements, which is not offset by the increase in available capital. Not surprisingly, feedback from many in the industry is that the QIS 2 technical specifications are too conservative. Further details are provided below:

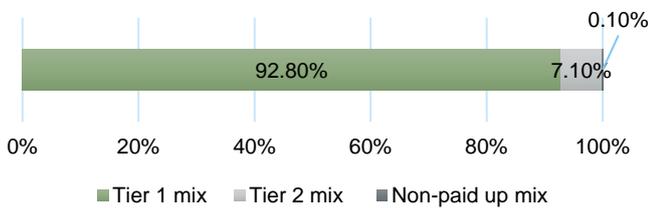
AVAILABLE CAPITAL – INDUSTRY RESULTS

Moving from the CAP 41 basis to the QIS 2 HKRBC basis, available capital has increased for the majority of companies. This can be explained by the following:

- The fair value of financial assets being higher than their book value;
- The inclusion of reinsurance assets, the value of which is usually larger than the reinsurance liabilities; and
- Some prudent margins within the net premium valuation (NPV) methodology used under the CAP 41 basis are released as the gross premium valuation (GPV) approach is used under the QIS 2 HKRBC basis, with negative reserves allowed. The decrease in reserve is particularly apparent for non-participating products and unit-linked products.

Under QIS 2, tiering of capital resources has been considered, splitting between Tier 1 capital, used to absorb losses on both a going concern basis and on a winding-up basis, and Tier 2 capital, used to absorb losses in a winding-up basis only. Non-paid up capital is not included as part of the capital resources under QIS 2. Based on the QIS 2 results, most of the assets (92.8%) are classified as Tier 1 capital, as shown under Figure 3.

FIGURE 3: TIERING OF CAPITAL ACROSS LIFE PARTICIPANTS



PRESCRIBED CAPITAL REQUIREMENT (PCR) – INDUSTRY RESULTS

Compared to the first quantitative impact study (QIS 1), the stress parameters used to calculate risk charges have been revised under QIS 2. The key changes are summarised under Appendix A of our previous e-alert titled “Hong Kong RBC – Second Quantitative Impact Study (QIS 2)” ([link](#)).

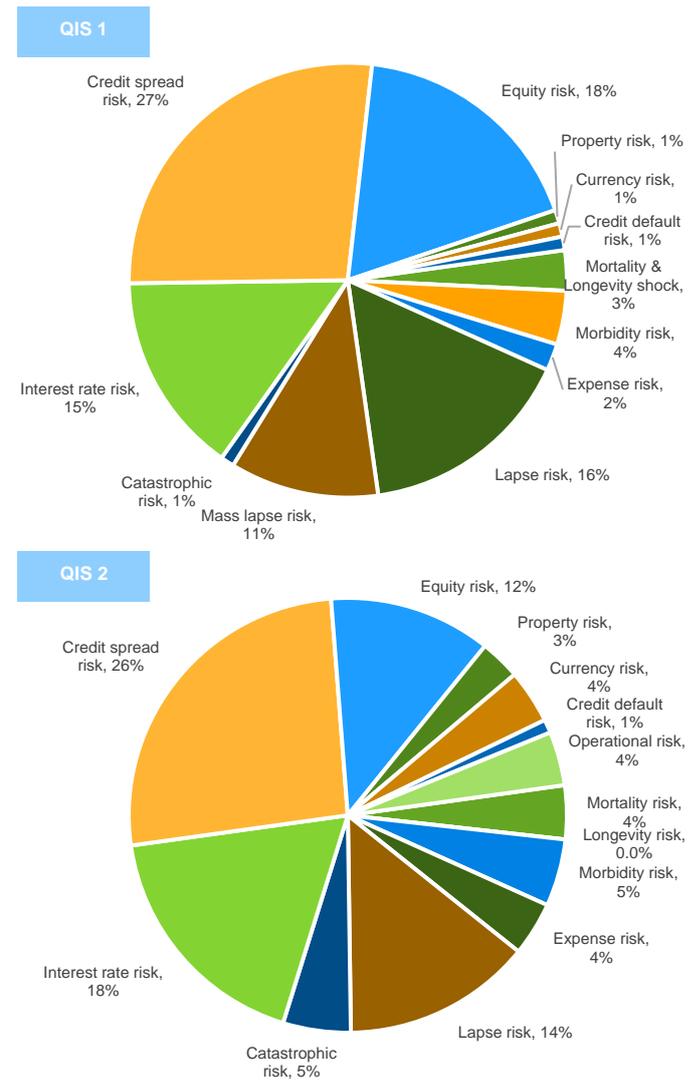
The distribution of PCR before diversification for each of the insurance risks and market risks under QIS 1 and QIS 2 is shown in Figure 4.

In terms of the contribution to overall PCR, similar to under QIS 1, the largest components under QIS 2 are credit spread risk (26%), interest rate risk (18%), equity risk (12%) and lapse risk (14%). Operational risk, which was not quantified in QIS 1, accounts for 4% of the total undiversified PCR.

Specifically on credit spread risk, which is inversely proportional to the credit quality of invested bonds, it is observed that

insurers already reporting under a Solvency II basis tend to invest in higher credit rated bonds and have a lower credit spread risk charge compared to companies not reporting under Solvency II. The same observation applies to interest rate risk, where Solvency II reporters tend to have better duration matching between assets and liabilities, and hence a lower interest rate risk charge.

FIGURE 4: QIS 2 AND QIS 1 PCR DISTRIBUTION BEFORE DIVERSIFICATION



It should be noted that lapse risk and mass lapse risk have been combined into one sub-risk module in QIS 2, where lapse risk is taken to be the worst of the lapse and mass lapse scenarios. 28% of the long term business participants had mass lapse as the “biting” scenario.

In assessing the PCR, companies are allowed to factor in their loss absorbing capacity (LAC) of liabilities to enhance their solvency positions under stress scenarios through various management actions, including the adjustment of future discretionary benefits. The use of LAC appears to have a

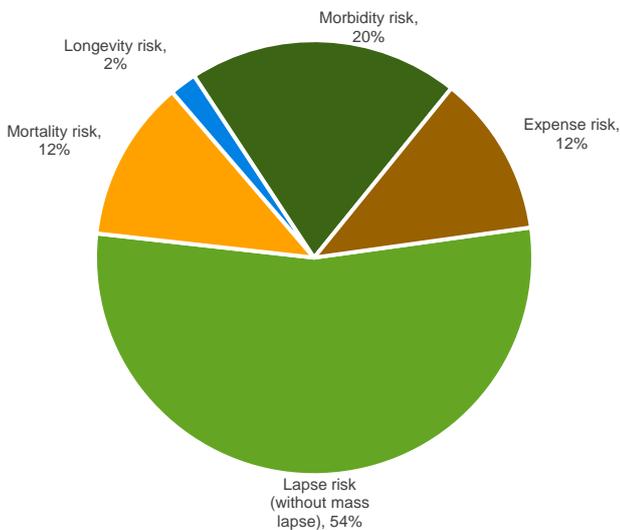
material impact under interest rate risk, credit spread risk and equity risk scenarios where the companies would reduce the non-guaranteed bonus for participating products and the non-guaranteed crediting rate for universal life products.

Margin Over Current Estimate

A margin over current estimate (MOCE) (sometimes called risk margin / risk adjustment under other solvency regimes) was tested in QIS 2. More specifically, a margin of prudence approach was taken, whereby companies were required to calculate the required capital with stress parameters calibrated at a 75th percentile. This approach is also used in Singapore and China, with the main advantage being simplicity to implement compared to the cost of capital approach used under Solvency II and the Bermuda capital regime. The cost of capital approach was included in QIS 2 as an optional sensitivity scenario.

In terms of results, the size of MOCE represents around 1% of the current estimate of liabilities and 6% of the PCR respectively at an industry level, with 54% of the MOCE contributed by lapse risk alone, which is consistent with the relative size of each non-economic PCR.

FIGURE 5: BREAKDOWN OF MOCE BY RISK MODULE



Time Value of Options and Guarantees (TVOG)

Three approaches were allowed under QIS 2 for companies to value the TVOG embedded in their business, namely a stochastic approach, a deterministic approach and a factor approach (proxy taken as 20% of deterministic current estimate of liabilities). Out of the 43 participants, 8 companies used a factor approach because of a lack of stochastic capabilities. For companies that used a stochastic approach, the TVOG as a percentage of current estimate by line of business is summarised in Figure 6.

FIGURE 6: SIZE OF TVOG BY LINE OF BUSINESS

Line of business	25 th percentile	Median	75 th percentile
Participating	1%	7%	14%
Universal life	1%	3%	12%
Retirement scheme with guaranteed capital (Class G)	0%	1%	10%

Discount rates and adjustments

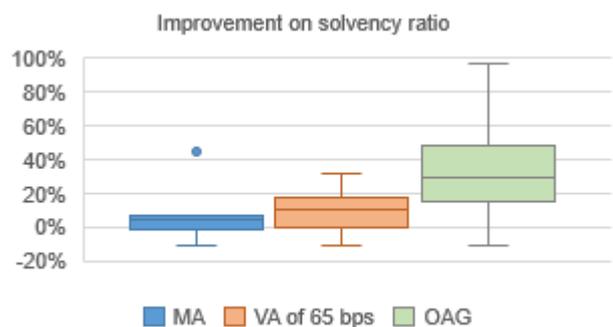
The discount rates used in an economic capital framework to value liabilities are often subject to extensive discussions as the possible approaches come with various pros and cons as well as having material implications on results.

DETERMINATION OF BASE CASE DISCOUNT RATES

In QIS 2, the “bottom-up” approach adopted is to add a volatility adjustment (VA) on top of the prescribed risk free yield curves, with the intention of capturing liquidity and risk premiums. At the same time, the IA and the Hong Kong Federation of Insurers (HKFI) have also asked the QIS 2 participants to derive extra sets of discount rates by making reference to the companies’ own assets and liability portfolios using two “top-down” approaches, namely the “Matching Adjustment” (MA) approach and the “Own Assets with Guardrails” (OAG) approach. The participants were also asked to assess the impact on their solvency ratio under these two approaches.

Despite the MA and OAG approaches being voluntary submissions, the asset portfolios of these companies cover as much as 70% and 40% of the total reserve of long term business participants for the MA submission and OAG submission respectively. The results show that the MA approach can, in general, enhance the solvency positions by less than 10% for most of the companies. The OAG approach could offer a greater uplift that ranges from 15% to 50% when looking at the 25th and 75th percentiles of solvency ratio enhancements due to the recognition of equity spread under this approach. Figure 7 shows the impact on solvency ratio under the different approaches:

FIGURE 7: IMPROVEMENT ON SOLVENCY RATIO UNDER DIFFERENT DISCOUNT RATE APPROACHES



Given the materiality of the impact from the choice of discount rate, the IA has specified that revisiting the VA / MA / OAG design is a key focus in QIS 3.

DYNAMIC ADJUSTMENT FOR CREDIT SPREAD STRESS

Dynamic spread adjustments allow companies to include a higher spread in discount rates under the credit spread scenario. A higher spread of 58bps (versus 32bps in the base case) is used as a proxy to a dynamic VA under the credit spread scenario. Additional data on possible dynamic MA and dynamic OAG were also collected through voluntary submissions to allow the IA to study the potential impacts.

Based on the IA’s analysis, dynamic VA and dynamic MA approaches give similar improvements on solvency ratios equivalent to below 15% for most companies. A dynamic OAG approach is seen to give more significant improvements of around 20% to 40% when looking at the 25th and 75th percentiles of solvency ratio enhancements.

The IA also noted that there are some companies with credit spread risk charges reduced to zero under a dynamic spread approach, and has said that revisiting the dynamic spread approach is one of the top three focus areas under QIS 3.

KEY FOCUS AREAS IN QIS 3 DEVELOPMENT

Based on the observations from the QIS 2 exercise, the IA has summarised the following key focus areas in QIS 3 development:

- Design of different discount rate approaches (VA / MA / OAG)
- Review of key parameters such as risk free yield curves and overseas property risk
- Correlations and dynamic VA / MA in credit spread risk PCR
- Correlations and stress structure in interest rate risk PCR
- Alternative approach for proxy TVOG
- Other possible risks not included in QIS 2
- Review of capital resources
- Holistic evaluation of the industry’s solvency position

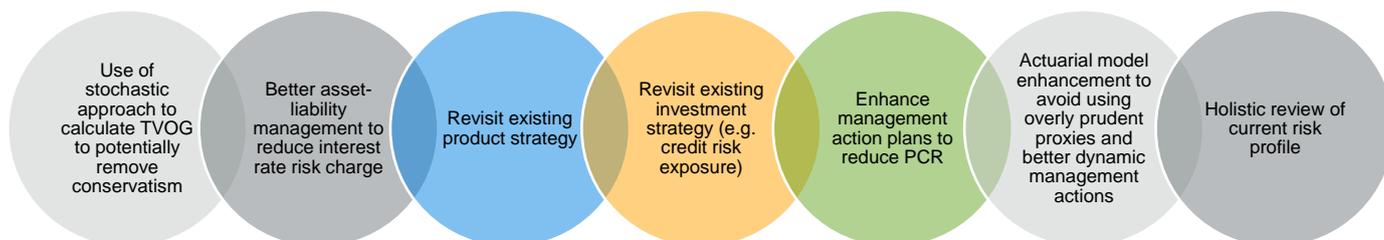
These development areas could have a material impact on solvency ratios under HKRBC QIS 3 basis and there is hope from the industry that these aspects, along with other changes, will help address the current perceived conservatism of QIS 2.

Key lessons learnt from QIS 2 and next steps

Based on the results of the current QIS 2 technical specifications, a large number of long term insurers would be insolvent (with solvency ratios below 100%). The results have come as a surprise to many observers and are generating widespread discussion within the Hong Kong insurance industry on the appropriateness of the QIS 2 requirements and their potential implications.

Some areas for enhancement have already been specified under the technical specifications and the list of key focus areas of refinements in QIS 3 listed by the IA. The IA has planned a pilot test (on a voluntary basis) for companies to test the impact on the revised proposal of VA/MA/OAG, credit spread risk and interest rate risk in Q2 2019 before the QIS 3 exercise commences by the end of Q3 2019. This would be a good opportunity for insurance companies to review critically their approach to establishing an economic capital framework before implementation of the HKRBC framework itself.

Given the potential implications of HKRBC, apart from providing feedback to the IA on the areas of QIS2 conservatism, we would expect long term insurers to be considering ways to enhance their solvency positions under this type of economic capital framework, especially for companies that are insolvent under QIS 2. Some potential actions may include:



If you would like to discuss any aspects of this e-Alert or would like to discuss this further, please contact any one of our consultants.



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

milliman.com

CONTACT

Michael Daly (Principal & Consulting Actuary)
michael.daly@milliman.com

Clement Bonnet (Principal & Consulting Actuary)
clement.bonnet@milliman.com

Sing Yee Yeoh (Consulting Actuary)
singyee.yeoh@milliman.com

Scott Chow (Consulting Actuary)
scott.chow@milliman.com

Clifford Wu (Actuarial Associate)
clifford.wu@milliman.com