
SINGAPORE ACTUARIAL SOCIETY

# RBC2 Taskforce Update

June 27th, 2014

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# INTRODUCTION & BACKGROUND

# Introduction & Background

## *The SAS Vision beyond the Guidance Notes…*

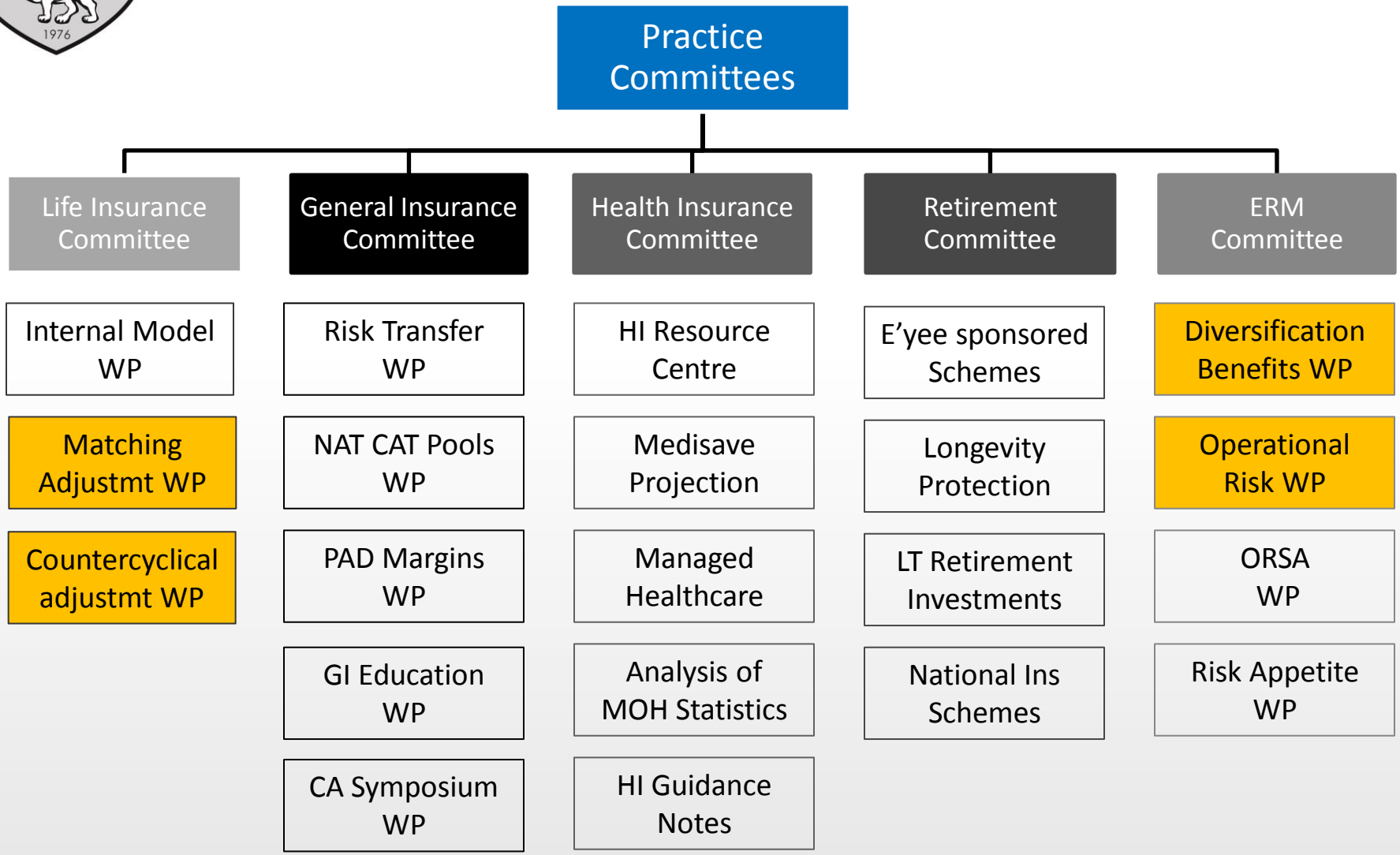
1. Raise profile of SAS and the actuarial profession:
   - Regular meetings with MAS, LIA, GIA, CPF, MOH
   - New Vision / New logo
   - GIA talks/seminars

2. Work as partnership with MAS and industry associations:
   - Formation of first RBC2 Taskforce in June 2012
   - SAS-MAS joint forum on Stress Testing in 2012 & 2013
   - Responded to CPs – at least 4 CPs in last 2 years!
   - Represented at 'Cat' working group by MAS

3. Provide research by capitalising our technical expertise:
   - Formation of working parties
   - Issue working party papers, technical notes

**Formation of SAS RBC2 Taskforce is part of SAS' growing VISION. But we need more VOLUNTEERS!!!**

# SAS Organisational Chart




- Formed as a result of RBC2 CP

# RBC 2 taskforce – timeline

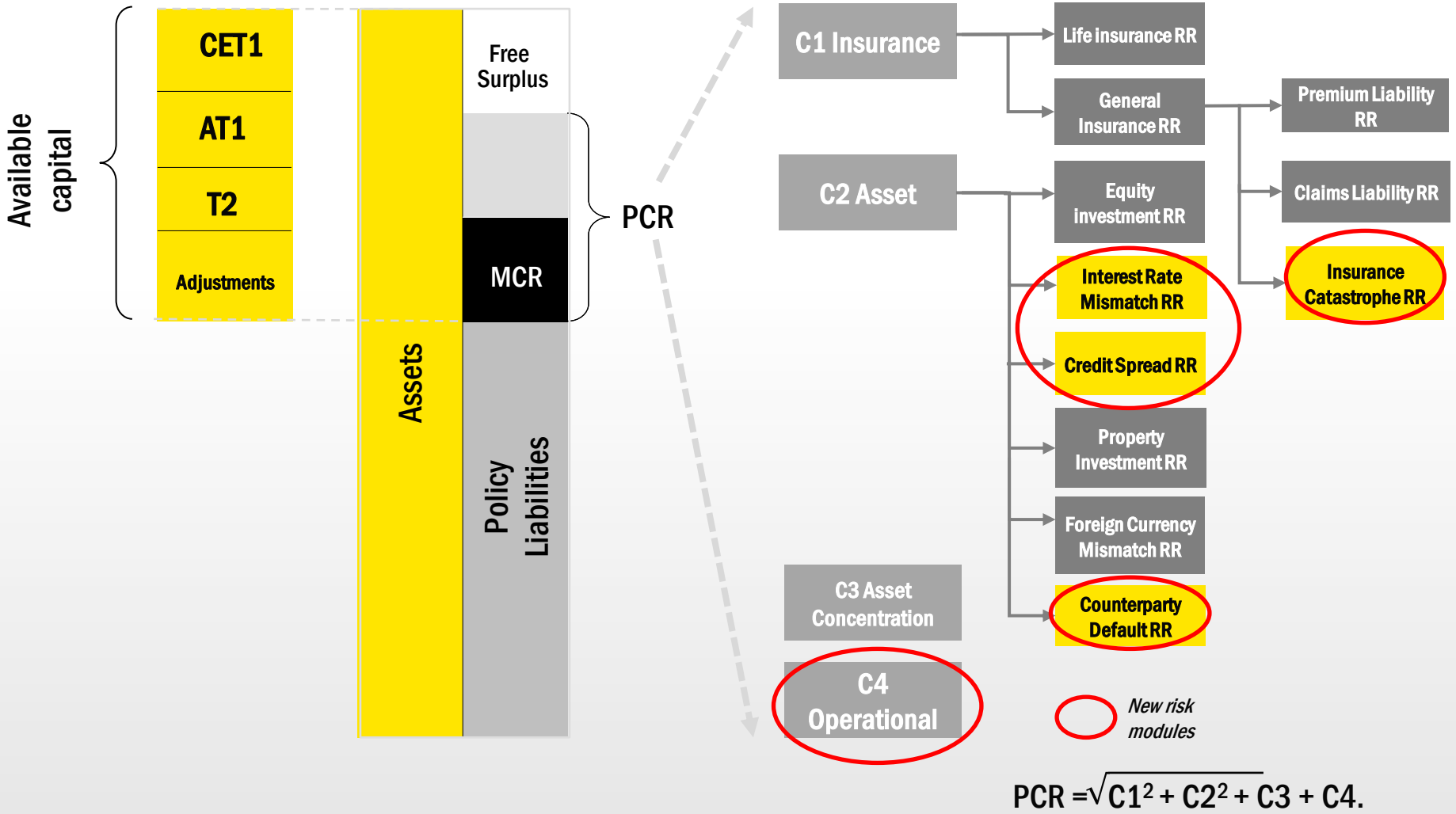
| Timeline | Tasks |
|---|---|
| 9-Apr | RBC2 kick-off meeting - timeline, schedule, roles & responsibilities |
| Various | Practice committees (LI, GI, ERM, Health) - to study each proposal in detail |
| 16-May | Each practice committee sends full comments/responses for consolidation |
| 21-May | RBC2 3 hour night meeting - facts gathering, compile findings into report |
| **30-May** | **QIS Exercise deadline** |
| 30 May | Send draft RBC2 report to taskforce |
| 13-Jun | RBC2 Taskforce meeting to discuss with QIS inputs & refine report |
| 19-Jun | Meeting with MAS |
| 23-Jun | Publish draft taskforce report on SAS website, call for comments |
| **27-Jun** | Taskforce presentation at RBC2 forum |
| 30-Jun | Revise final report with comments from forum |
| 30-Jun | Submit report to MAS, request MAS for time extension if can't |
| **30-Jun** | **RBC2 CP deadline** |

# SUMMARY OF RBC2 CONSULTATION PAPER

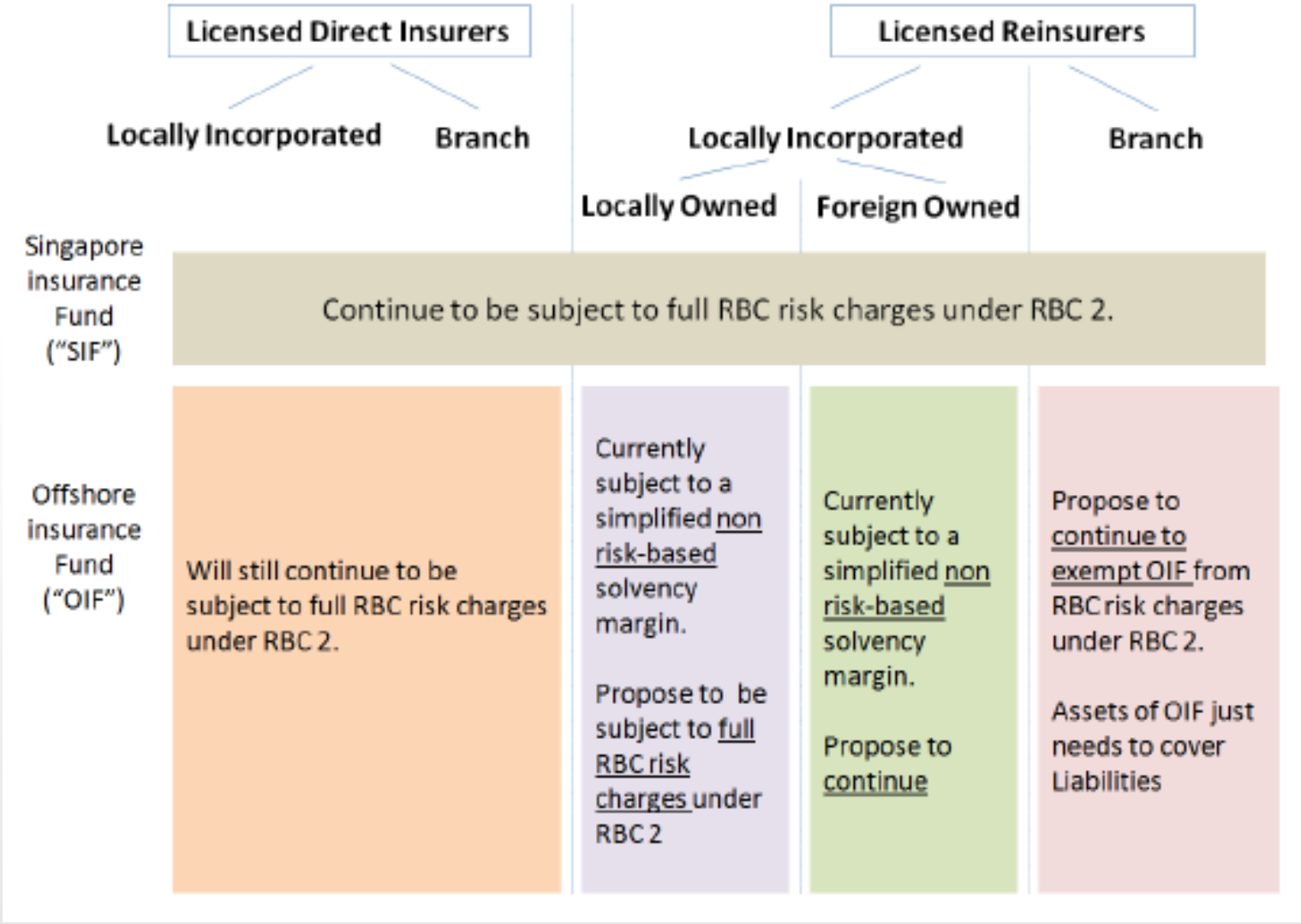
# RBC 2 – Expected timeline


- QIS 1 to be completed by 30 May 2014
- Response on RBC2 2nd Consultation Paper by 30 June 2014
- Further work expected between 2014 and 2016 with an expected implementation date of 1 Jan 2017
- For GI insurers, refinement of insurance calibration (include 'Cat' risk charge) will be undertaken at a later date

# Regulatory B/S: RBC 1 vs RBC 2



# Impact on different types of insurance entities



# HIGHLIGHT OF KEY SAS RESPONSES

# Important Consideration

- There may be undue increase in regulatory capital over the current requirements. The increased cost of capital will eventually be passed on to consumers through higher premiums or lower coverage

- SAS have not conducted an independent assessment on the calibration factors in the CP. The SAS would request MAS to provide data and assumptions used to derive the calibration factors in circumstances where risk factors:
  - have a significant impact or very different from current regime;
  - appear contradictory to SAS' view

- The SAS working parties will continue to provide further research to partner with MAS to refine the RBC2 risk factors

# Highlight – RBC2 2nd Consultation Paper

| Proposals | Key Topics | Taskforce Responses |
|---|---|---|
| CQ 1 | **3 month timeframe** | • 3 months as guideline to allow companies to develop a plan to restore PCR<br>• To confirm appropriateness of 3-months after the calibration is finalised<br>• "Exceptional circumstances" should go beyond market stresses<br>• Treatment for Head Offices/ Subsidiaries / Branches likely differ |
| CP 3, 4<br>CQ 2, 3 | **Matching Adjustment ("MA")** | • Consider partial recognition of illiquidity for all types of liabilities through volatility adjustment ("VA")<br>• Application of the matching adjustment should be principle based<br>• Rules around gradual phase out of LTRFDR can be considered once liquidity can be built up |
| CP 6 | **Diversification Benefits** | • How to determine the risk pairs to include under C1 correlation matrix for life business and choice of correlation parameter<br>• C1 correlation matrix should extend to all C1 components includes lapse risk<br>• An explicit correlation between different C2 risks will be more helpful and help insurers' in planning their investment portfolio<br>• Diversification between funds should be expanded to all risks (e.g. mortality risk vs annuity risk, credit spread vs credit risk, between lapse risks) |

# Highlight – RBC2 2nd Consultation Paper

| Proposals | Key Topics | Taskforce Responses |
|---|---|---|
| CP 7 ~ 18 | **C1 requirements for Life Business** | • Agree with removal of references to prescribed standard table (mortality & annuity) and placing greater reliance on Appointed Actuaries' judgment<br>• C1 factors (Mortality shock, Mortality (annuity) shock, disability shock & lapse shock) should be calibrated using the change versus expected experience over a specific time horizon<br>• The calibrated risk factor on morbidity shock seems onerous unless outputs of current MAS-prescribed stress test scenario for morbidity catastrophe have been duly taken into account |
| CQ 4 | **C1 requirements for General Business** | • Since the current premium and claim liability calibrations have implicitly included an allowance for catastrophe risk, so need to ensure no double counting when calibrating the new catastrophe risk charge requirements |
| CP 19 ~ 21 | **C2 requirements** | • The SAS encourages explicit diversification to be used<br>• The equity risk charge appears to be too high. Calibration may have overstated as using last 10 years' data may not be appropriate<br>• The diversified factors under RBC 2 are relatively high as compared to other regimes such as Europe and Australia<br>• SAS suggests revising risk charge for CIS of 50% to 60% as per unlisted equities if the insurer chooses not to apply the look-through approach |

# Highlight – RBC2 2nd Consultation Paper

| Proposals | Key Topics | Taskforce Responses |
|---|---|---|
| CQ<br>5 ~ 6 | **Counter-cyclical Adjustments** | • The SAS supports counter-cyclical adjustments (CCA) and agrees CCA should be activated upon significant movements, but disagrees that it is only applied to equity<br>• The formulae should be pre-determined based on a sound basis and be easily explainable. A clear and transparent CCA mechanism is important for capital planning (consistent with ORSA) & ensure a level playing field<br>• CCA should also apply to all classes that exhibit reversion behaviour and not only confined to Singapore listed equities |
| CP<br>22 ~ 31 | **C2 requirements** | • The SAS supports recognition of diversification between insurance funds when calculating interest rate mismatch risk requirement at company level<br>• Diversification should extend to the Par fund<br>• Diversification benefits for insurers writing Health, Life & General Insurance business can be considered<br>• The SAS agrees with the proposal to apply a credit spread risk calculation to both assets and liabilities<br>• The SAS suggests allowing the usage of internal rating models in evaluation of credit rating of unrated bond issuances (in line with spirit of ORSA)<br>• The 50% risk requirement on the marked-to-market value of structured products appears excessive. In addition, a flat rate may create a perverse incentive for insurers to hold those products that are riskier than implied by the risk charge |

# Highlight – RBC2 2nd Consultation Paper

| Proposals | Key Topics | Taskforce Responses |
|---|---|---|
| CP 28 ~ 31 | **C2 requirements** | • On removal of 10% concession for foreign mismatch requirement for SIF, consideration should be given to the risks of asset concentration in a single country as insurers with large Singapore Life Funds may find it necessary to invest in foreign assets<br>• There should be a distinction between premium 'past-due' versus 'unbilled' where the former is more subject to counterparty risk<br>• On premium receivables, it does not appear reasonable to apply a risk charge of 100% to premium which is contractually obliged but is not due to be collected in > 12 months due to the payment structure of the contract<br>• Ageing exposure split by ratings is too granular for general insurance and reinsurance companies<br>• The SAS suggests to treat unrated SMEs the same as unrated persons / policyholders rather than (re)insurers, i.e. apply counterparty risk charge of 7.75% instead of 48.5%<br>• Internal reinsurance should be recognised for non-life insurers |
| CQ 7 | **C3 requirement** | • The SAS suggests to remove C3 requirements because insurers are expected to maintain PCR > 100%, and replace C3 requirement by a deduction of financial resources. Asset deductions should be changed from fund level to company level |
| CP 32<br>CQ 8 | **C4 requirement** | • RBC2 operational risk charge is much higher than that under other solvency regimes in other jurisdictions<br>• The SAS suggests removing C4 and allowing insurers to factor for operational risk within their ERM / ORSA framework |

# Highlight – RBC2 2nd Consultation Paper

| Proposals | Key Topics | Taskforce Responses |
|---|---|---|
| CP 38 ~ 39<br>CQ 12 | **Treatment of Negative Reserves** | • Given that negative reserve is computed after applying all insurance shocks, the basis is already overly prudent. Therefore 100% allowance should be granted. The SAS also noted that other jurisdictions have not applied insurance shocks to the negative reserves.<br>• The SAS agrees that recognition for negative reserves at both company and fund level is appropriate. |
| N/A | **Treatment of Aggregate of APNGB** | • The SAS proposes that the financial resources for non-guaranteed benefits should be 100% rather than 50%. The Society would like to reiterate that loss absorption capability is a key feature of Par products. A cap in the FR recognition, coupled with a significant higher calibration, will affect the viability of Par products. |
| CP 43<br>CQ<br>15 ~ 16 | **Proposed Timeline and Transitional Provisions** | • The time and effort needed to undertake research and analysis arising from this round of consultation/QIS should not be under-estimated. A more realistic timeline would be for QIS2 to commence in Q2 2015. MAS should share its findings from QIS some time in Q4 2014 and have additional discussion with the industry (including the SAS) in preparation for QIS2. |

# UPDATES FROM WORKING PARTIES

# VALUATION INTEREST RATE WORKING PARTY

With contributions from the team members:

Abhishek Kumar (WP Lead)

Alex Lee

Cheung Kwok Kei

Lim Mei Mei

Ng Kok-G

Zhu Yan

Chen Shao Guang

Harry Lee

Mark Shi

Tan Yue Li

# Scope

- Evaluate the proposed MA framework, including assessing the appropriateness of the requirements in Singapore context
- Counter propose alternatives to MA
- Comment on the proposal on the LTRFDR mechanism
- Identify areas where further investigations are required

# Key Observations and Recommendation

Key Observations

- Certain criteria for the matching adjustment application are stringent in the Singapore context.
- In its current form, MA does not recognise the underlying illiquid nature of some insurance liabilities.

Recommendation

- Consider partial recognition of illiquid in the insurance business, such as through Volatility Adjustment. MA available to insurers who are able to demonstrate better ALM matching. Propose to work with MAS and industry bodies to further refine the calculation and application.
- Propose to work with the MAS to test and refine the MA criteria.
- Conduct further research on the valuation interest.

# Volatility Adjustment (VA)

- Recent legislation on Solvency II includes an allowance for the partial recognition of illiquidity in the form of VA. VA is also designed to reduce the volatility in balance sheet and reflect that insurance companies typically hold a certain proportion of illiquid assets.
- Propose VA :
  - To be applicable to all insurance liabilities as a default adjustment, with safeguards to avoid cherry picking;
  - To be based on an average spread for the assets held in a reference portfolio (which represent a typical portfolio held by insurance companies);
  - No need for ring fencing assets and liabilities;
  - On balance sheet and will be subject to a bi-directional credit spread stress to avoid cherry picking by insurers;

# Matching Adjustment

Initial Evaluation on MA

- Shortage of long term assets in Singapore market will impose challenges to "cash flow shortfall" criterion.
- Insurance risk. Our initial finding shows that generally shorter term liabilities are able to satisfy the 20% criteria.

To further consider:

- Fixed cash flow are portfolio level (rather than at asset level)
- The use of derivatives to improve matching
- Clarity on the requirement on the separate management of assets and liabilities.

# LTRFDR Mechanism

- MAS proposes to remove the existing Long Term Risk Free Discount Rate (LTRFDR) mechanism after 5 years. Gradual transition to market yields until year 30 and a flat yield beyond 30 years.

- Propose to carry out further work. We are proposing to work with the MAS in the following areas:
  - Extrapolation of risk free rate;
  - Definition of the last illiquid point;
  - Use of market yield and its related impact on volatility.

Next Step:

The WG will work further on the proposals, and expect to complete by 2H 2014. Volunteers and comments are welcomed!

# COUNTER-CYCLICAL ADJUSTMENT WORKING PARTY

With contributions from team members:

Alex Lee (WG Lead)

Harry Lee

Mark Shi

Cheung Kwok Kei

Ng Kok-G

Zhu Yan

# Scope

- Confirm the need for a Counter-Cyclical Adjustment (CCA)
- Evaluate the principles
- Enlarge scope to include other asset classes where adjustment should be considered
- Evaluate the choice of proxy

# Justification for CCA

- Risk is defined based on the net impact on A&L value changes within 1 year, which is not a good match to life insurance duration (mostly long-term).
- Market volatilities will bring swings to life insurers' PCR which subsequently cause insurers to liquidate assets to comply with PCR during the down period.
- The workgroup hence believe that a well designed CCA is critical.

# Feedback to Principles Proposed by MAS

- We agree with MAS that the formula should be predetermined, based on sound basis and easily explainable. In particular, we are of the view that this is important for the purpose of capital planning, as well as to ensure a level playing field for all insurers.

- We agree that CCA should be activated upon significant movements, but disagree that it is only applied to equity. Need to define what is deemed as significant as also whether it should be variable yearly (to be balanced with the point above). Risk requirement just before and after the trigger points should be continuous instead of discreet to prevent the "cliff/jump" behavior.

- We disagree that application only confined to Singapore listed equity. It should be principle based and should apply to classes that exhibit reversion behavior. Non-Singapore listed equity should be considered at the minimum.

# Feedback to Principles Proposed by MAS

- We broadly agree with an appropriate proxy. There is a balance to be struck between ease application (principle 1) and risk sensitivity. STI seems appropriate. But again, it should not only confined to Singapore equities.

- On adjustment not causing significant deviation, we are of the view that the adjustment should reflect the strength of the reversion behavior in the observed risk type (can be allowed to negate most base requirements if sufficient data to support this). Nonetheless we are agreeable to a cap, similar to the SII standard formula.

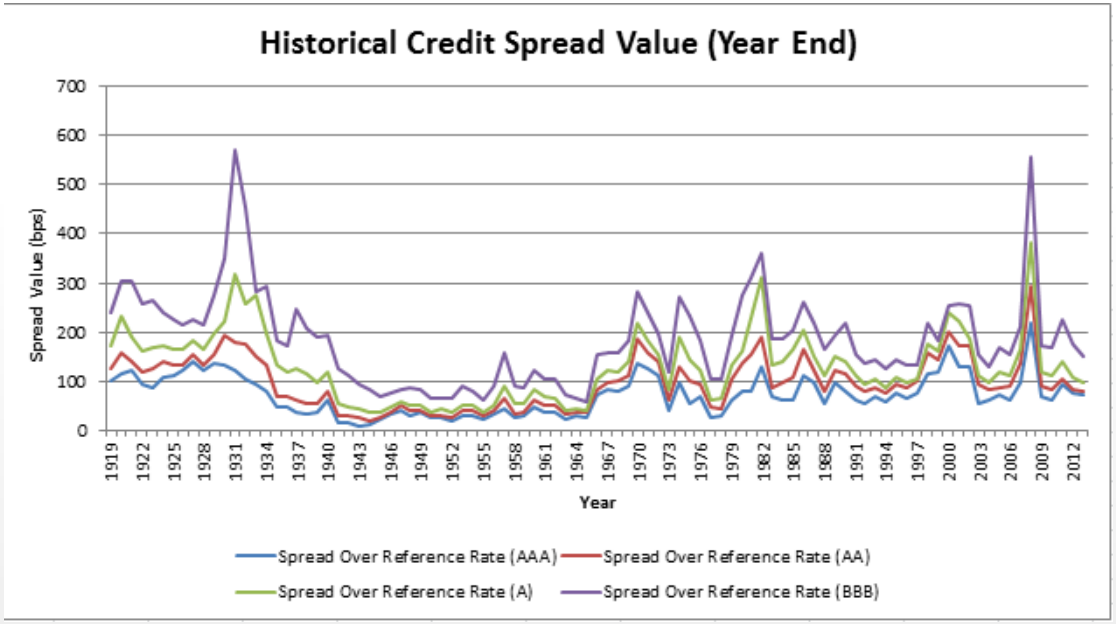
# Scopes Covered by CCA

- **Not only on equity risk, but also spread risk and interest rate risk requirements.**
  - Bond force-selling may cause bond market to dislocate and the spread to widen further.
  - Interest rates exhibit mean reversion, although we note that the proposed expression of interest rate shock as %(and a cap) is a "natural" CCA.

- **Not only limited to Singapore market but global.**
  - Both local and Singapore asset fire sale to restore PCR during a down market will cause the insurance industry as a whole to be weaker financially.

# Reversion Behavior of Credit Spread

- Initial research tends to support the existence of mean-reversion characteristic in credit spread. The diagram below shows the history of US corporate spreads since 1919.




- Studies also show that the strength of reversion depends on the initial value of credit spread. For instance, the higher the spread level, the more likely it would drop in the subsequent period.

# Choice of Market Proxy

- A balance between risk sensitivity and ease of application/understanding.
- CCA should not be dependent on how diversified the insurer's holding is, as CCA should seek to reflect the systemic risk component of price movement.
- Therefore, STI can possibly be used as a proxy for equity investments.

Next Step:

The WG will work further on the proposals, and expect to complete by 2H 2014. Volunteers and comments are welcomed!

# OPERATIONAL RISK WORKING PARTY

With contributions from the team members:

Julien Parasie (WP Lead)

Raymond Cheung

Bruno Pinson

David Maneval

Esther Huang

Loh Veng Hoong

# Scope of survey

- Our survey is based on publicly available 2012 MAS Return.
- We selected 27 companies in order to obtain a fair coverage of the Singapore insurance market but also to cover some niche players.
- The population is composed of:
  - 7 Direct life insurers;
  - 4 Life reinsurers;
  - 10 Direct general insurers; and
  - 6 General reinsurers.
- The coverage is as follows (by premium income):
  - OIF Life insurance: 72%
  - SIF Life insurance: 88%
  - OIF General Insurance: 44%
  - SIF General Insurance: 55%

# Method Used & Assumptions

- Assumptions and shortcuts:
  - Gross policy liabilities are not available in MAS returns, we applied a retention ratio (derived from gross and net premium) on net policy liabilities.
  - In the Singapore formula, C4 is capped at 10% of RBC 2 TRR. As RBC 2 TRR are not available, we used the RBC 1 TRR.
  - In the Solvency 2 formula, operational risk charge is capped at 30% of S2 BSCR. As BSCR are not available, we did not apply any capping.
  - Regarding the Taiwan formula, we assumed that the assets under management corresponds to the invested assets. Figures related to annuity business are not available, we apply a risk charge of 0.5% to the entire life business.

# Recap: RBC 2 Operational Risk Requirement Formula

- MAS proposes the C4 operational risk requirement to be calculated as follows:

  x% of the higher of the past 3 years' averages of

  (a) Gross written premium income;

  (b) Gross (of reinsurance) policy liabilities.

  Where x = **4%** (except for investment-linked business, where x = 0.25%)

  subject to a cap of 10% of the total risk requirements (after applying the diversification benefits but excluding the operation risk requirement itself, in order to avoid circularity in computation)

# Comparison of formulae across jurisdictions

| Jurisdiction | Highest of a % of premium and reserves | | | % of AUM | Capping? |
|---|---|---|---|---|---|
| | GI | Life excl IL | IL | | |
| **Singapore RBC2** | 4% | 4% | 0.25% | 0% | Yes |
| **Europe Solvency 2** | 3% | 0.45% | NA* | 0% | Yes |
| **Australia GPS118 and LPS 118** | 2 to 3%** | 2 to 3%** | | 0% | No |
| **Taiwan** | 1.50% | 0.5% to 1%*** | | 0.25% | No |

* 0.25% of yearly expenses incurred in respect of IL pollicies

** 2% for reinsurance inward, 3% for others

*** 0.5% for life business, 1% for annuity business and 1.5% for all other businesses

- Depending on jurisdiction, percentage applied on premium/reserves ranges from **0.25% to 4%.**
- According to our survey, operational risk charge exceeds:
  - 30% of the RBC1 TRR on average for life insurers before capping;
  - 15% of the RBC1 TRR on average for non-life insurers before capping;
  - 12% of the RBC1 TRR on average for reinsurers before capping;

# Comparison across jurisdictions - Life Insurance

- The RBC2 operational risk charge formula for life insurers (4%) **is 9 times higher** than Solvency 2 (0.45%). The cap is triggered for every life insurance company.
- Cap on TRR (C1 to C3) suggests companies to focus on asset risk and insurance risk but not operational risk.
- Unclear why ILP attracts a lower risk charge – more transparent to list the categories of operational risk events that C4 is meant to cover, and how different business lines contribute to them.
- Proposed risk charge for non-linked business (i.e. 4% of liabilities) may be excessive. Applying the same x% to both earned premium income and gross policy liabilities may not be appropriate – new business exposes an insurer to greater operation risks (e.g., market conduct, product development, system implementation, expense over-run, etc) as compared to in-force business.

# Comparison across jurisdictions – General Insurance

- Using gross policy liabilities could lead to extreme volatility (e.g., for small specialist insurers immediately following a large claim, or for small/medium property (re)insurers immediately following a catastrophe). Net liabilities should be considered instead.
- There should be a distinction between reinsurance business and direct business. In particular, reinsurance companies should apply a lower operational risk charge- given that reinsurance business involves fewer individual policies, claims-processing activities and lower sales & marketing risk.
- In general, non-life insurers may utilise a high level of reinsurance, and so the operational risk factors calculated on a gross basis could result in triggering the 10% cap quite easily.

# Relevancy of Operational Risk Requirement (1)

- In our opinion, addressing the operational risk through a capital charge should not be the preferred approach:
  - There is no industry consensus regarding the way to assess the operational risk in terms of models and data. No study shows there is a reliable methodology to measure it (please refer to ORWP presentation for the 2013 EAAC).
  - Using a percentage of premium or reserves does not capture some of the operational risks (system failure, legal risk, etc). Operational risk charge is hard to estimate accurately due to no agreed model, methodology as well as lack of data.
  - Part of the operational risks are included in other risk charges like the C1. Adopting the banking approach of deriving operational risk charge from ground-up will lead to double-counting of risk.

Next….

# Relevancy of Operational Risk Requirement (2)

Continued….

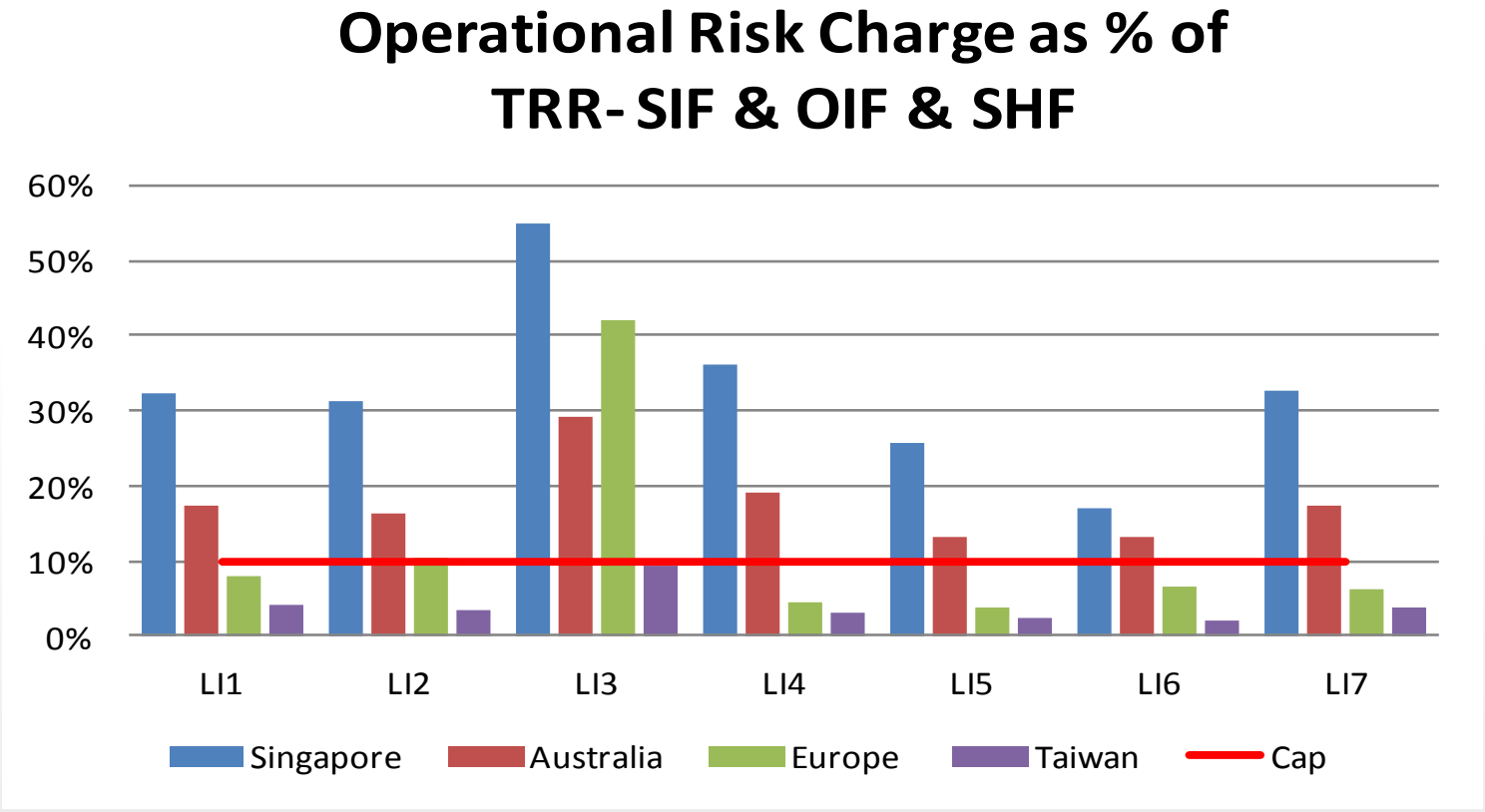
- The default of insurance companies in history are not operational risk triggered (with an exception of HIH Insurance group in 2001 due to misselling), so the significance of an operational risk charge is questionable.
- A qualitative approach via the ERM framework may be more suitable to promote sound risk management practices and incentivise organisations to better understand the causes of operational failure.

# Our Recommendations

- We propose not to impose a standardised operational risk requirement which is not related to the quality of management of this risk.
- We consider it more appropriate to address operational risk under the insurer's ERM framework or the ORSA process. By removing C4 and including operational risk under ERM/ORSA framework, MAS could still effectively apply an additional capital charge if a insurer's ERM framework proves to be inadequate.
- Insurers should be encouraged to implement proper risk management processes in order to identify and manage their key operational risks (e.g. improved IT system, proper internal controls, adequate peer review/self audit, scrutiny of large transactions, etc).
- We do not support a compulsory industry-wide implementation of an economic capital model for the purpose of quantifying operational risk.
- However, we support the insurer's own internal assessment of its operational risk profile (for instance based on scenario analysis).

# SOME SURVEY RESULTS

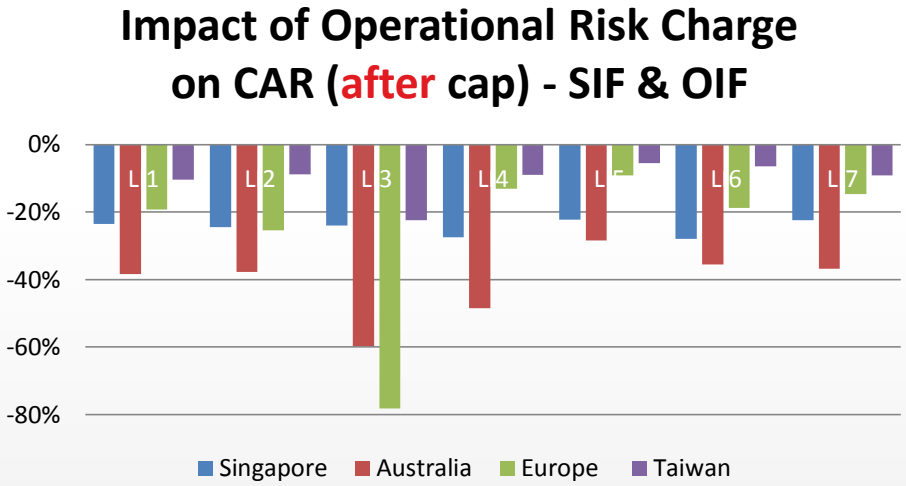
# Life Insurers (1)

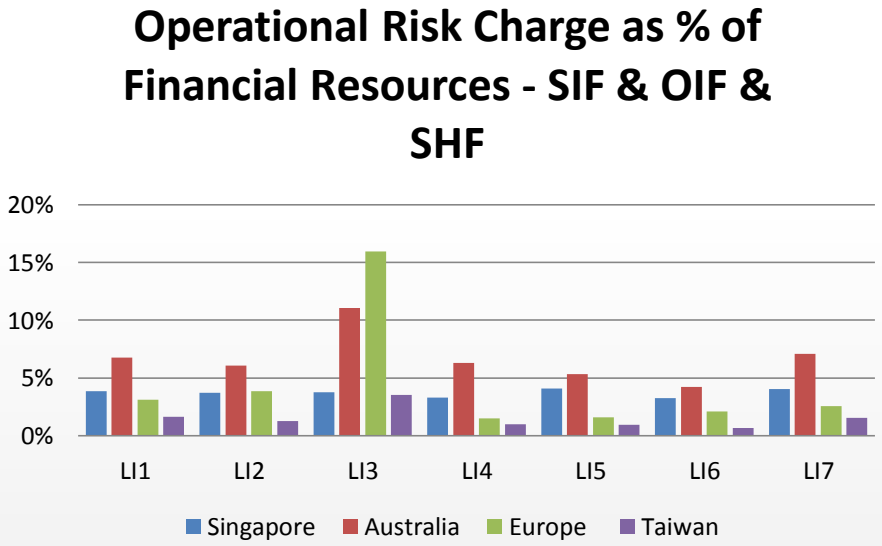



**Remarks :**

1. Operational risk charges for all 7 life insurers substantially exceeded the cap of 10% of TRR imposed under RBC2, suggesting a need for recalibration.
2. RBC2 operational risk charge before cap is significantly higher than other jurisdictions

# Life Insurers (2)

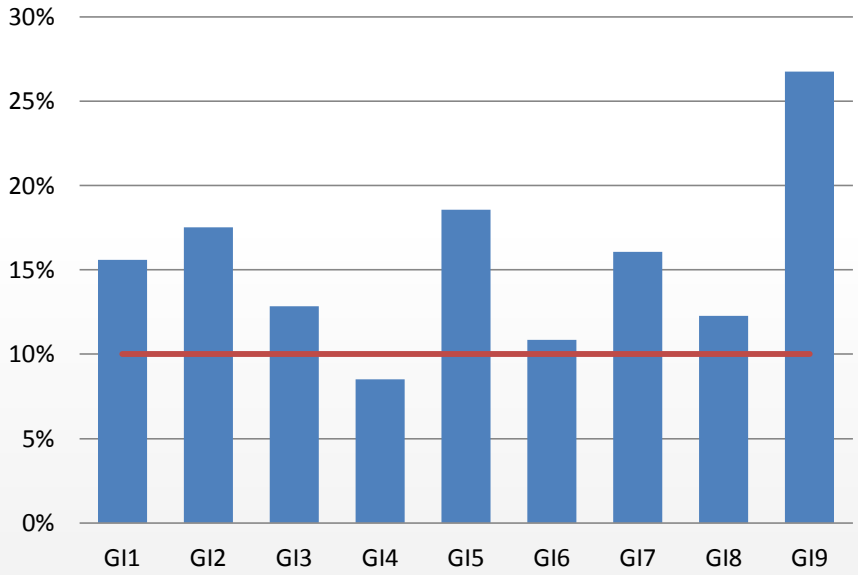


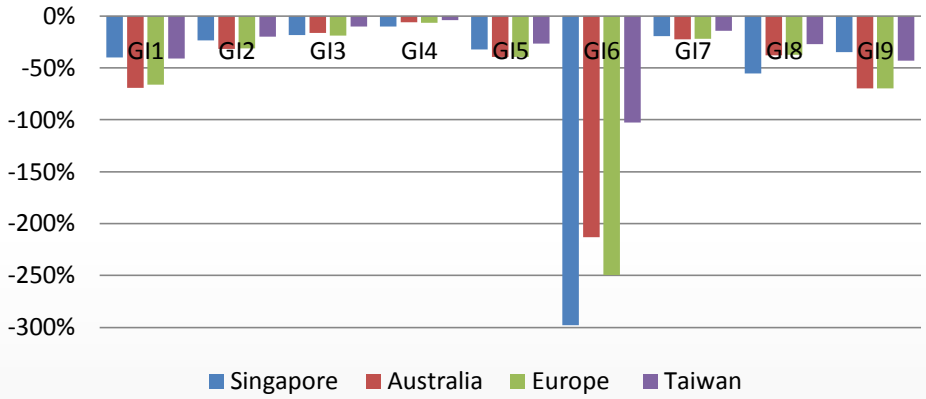

**Remark:** After capping the operational risk charge at 10% of the TRR, the charge is relatively in line with other jurisdictions.

# General Insurers

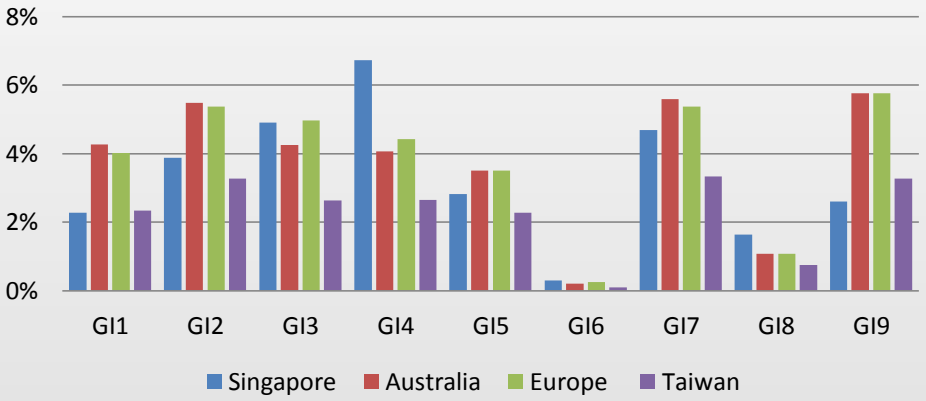
## Operational Risk Charge as % of TRR (before cap) - SIF & OIF & SHF




## Impact of Operational Risk Charge on CAR (after cap) - SIF & OIF

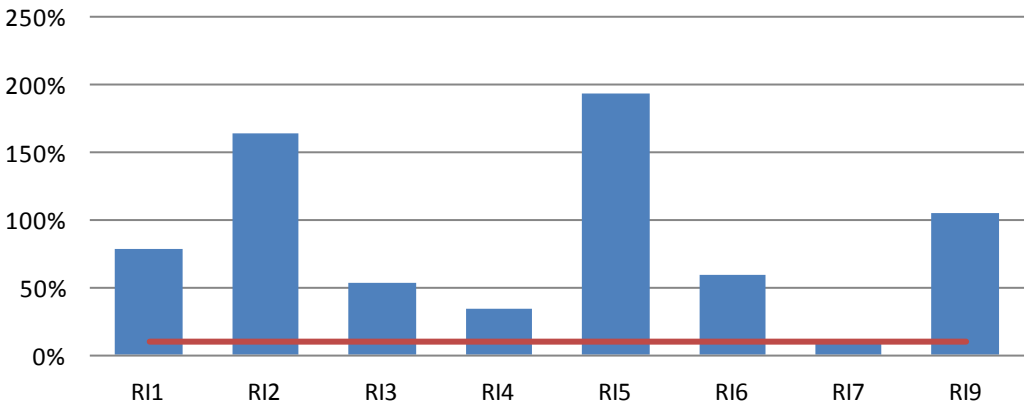


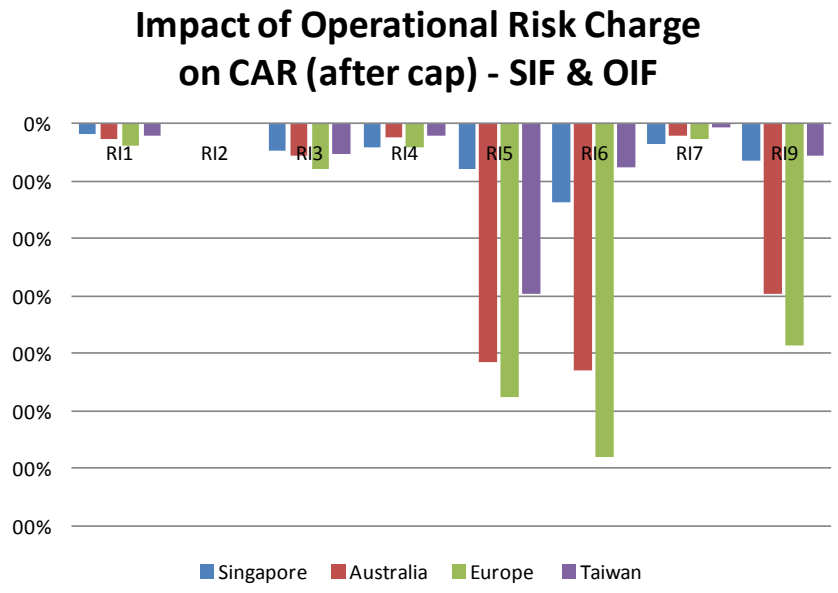

## Operational Risk Charge as % of Financial Resources - SIF & OIF & SHF



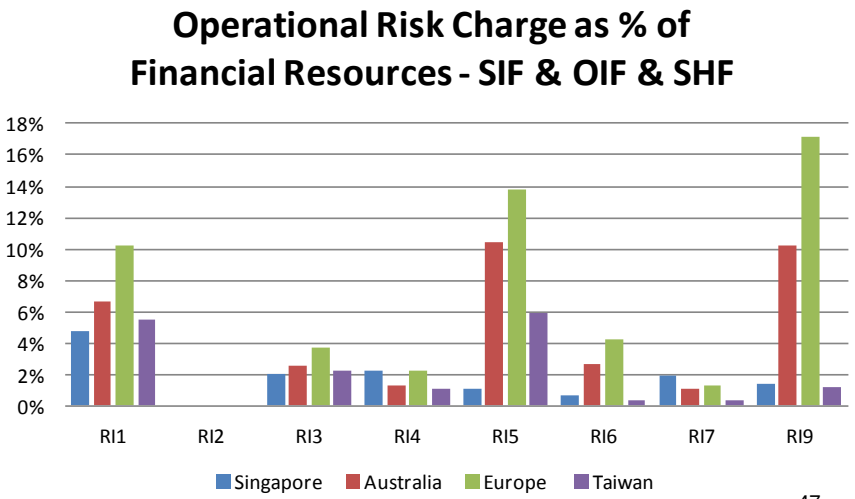

**Remark:** Apart from one instance (GI4), all the rest of the general insurers have operational risk charge exceeding the cap of 10% of TRR imposed under RBC2, suggesting a potential need for recalibration. After cap, the RBC2 operational risk charge is roughly in line with other jurisdictions.

# Reinsurers




**Remark:** Apart from one instance (RI7), the rest of the life, general and composite reinsurers have an operational risk charge exceeding the cap of 10% of TRR imposed under RBC2, suggesting a need for recalibration.
After the cap, the RBC2 operational risk charge seems lower than in other jurisdictions.



# LIKELY IMPACT OF RBC2

# RBC 2 – Summary of Likely Impact

- **Capital Impact**
  - Higher regulatory capital cost
  - Reinsurance – use more reinsurance to lower capital requirements?
  - Capital management & optimisation (e.g., to have robust capital structure)
  - Active liquidity and cash management
  - More robust stress testing / scenario analysis

- **Operational Impact**
  - Higher regulatory compliance cost (e.g., need to build infrastructure / template and new processes for regulatory reporting)
  - Allowance for additional resources, time & cost of implementation
  - Continuous maintenance – focus on data quality
  - Automation of certain reporting processes (e.g., use modeling)

- **Business / Strategy Impact**
  - Change risk appetite / internal capital trigger point?
  - Change the level playing field for some companies (e.g., local reinsurers)
  - Review investment strategy
  - A comprehensive ERM framework, ORSA process and culture
  - Better decision making, i.e. using capital more efficiently?

# Q&A