Product Strategies under Solvency II and IFRS 4 Phase II

Tze Ping Chng
Thomas Tang
Ernst & Young

Session Number: TBR13
Why is this relevant in Asia?
Implementing Solvency II along with local solvency requirements

- The levels of regulation sophistication and the appetite for Solvency II vary among Asian markets

<table>
<thead>
<tr>
<th>Countries in Asia</th>
<th>EY’s observations</th>
<th>Regulator’s appetite for Solvency II</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>★★</td>
<td>★★</td>
</tr>
<tr>
<td>Philippines</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>India</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Indonesia</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Japan</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Korea</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Malaysia</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Singapore</td>
<td>★★★</td>
<td>★</td>
</tr>
<tr>
<td>Thailand</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Taiwan</td>
<td>★★</td>
<td>★</td>
</tr>
<tr>
<td>Vietnam</td>
<td>★★</td>
<td>★</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophistication level of solvency regulation</th>
<th>Regulator’s appetite for Solvency II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least sophisticated</td>
<td>Capital not risk based, rule based regulation, lower transparency on disclosure</td>
</tr>
<tr>
<td>Less sophisticated</td>
<td>RBC recently established, rule based regulation, medium transparency on disclosure</td>
</tr>
<tr>
<td>Sophisticated</td>
<td>RBC embedded in Business, rule based regulation, medium transparency on disclosure</td>
</tr>
<tr>
<td>More sophisticated</td>
<td>RBC embedded in Business, principle based regulation, high transparency on disclosure</td>
</tr>
<tr>
<td>Most sophisticated</td>
<td>Solvency II or equivalent</td>
</tr>
</tbody>
</table>

- More focused on other topics than on Solvency II (e.g. RBC implementation, Takaful, etc)
- Monitoring Solvency II, may adopt some key elements of Solvency II
- Monitoring Solvency II, may consider a Solvency II equivalence
- Pursue a Solvency II equivalence
Agenda

► Overview of Solvency II
► Strategic and Commercial Implications - Products
► Product impacts
► Key product issues
► Simplified case study
► IFRS 4 Phase II ... comparing to Solvency II
Overview of Solvency II
Part of an Evolution
Tendency towards market consistency and risk awareness

Risk based

Value based

Solvency I
EEV
Traditional insurance accounting

Solvency II
IFRS 4 Ph2
MCEV

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/
Quick overview of Solvency II

► The new Europe-wide framework for prudential supervision of insurance companies
► Increase the level of European harmonization in the solvency regime
► Aim of Solvency II is to link the required capital of insurance companies more closely to the risk profile of insurance companies
► Principles based but more prescriptive than IFRS
► Market consistent approach for valuing assets and liabilities
► Capital requirements linked to risk profile
► Major focus on risk management
► Significant disclosure requirements
Quick overview of Solvency II

Three pillar structure

Pillar I
- Technical provisions
- MCR minimum capital requirement
- SCR solvency capital requirement

Pillar II
- Own risk and solvency assessment (ORSA)
- Internal model
- Supervisory powers and processes

Pillar III
- Disclosure-solvency and financial condition report
- Market discipline
Pillar 1
Capital requirements and market value balance sheet

**Solvency I framework**

- **Statutory balance sheet**
  - Asset
  - Liability
  - Free surplus

  Implicit prudence in technical reserves and assets

- **Solvency I**

**Solvency II framework**

- **Solvency II balance sheet**
  - Asset
  - Liability
  - Free surplus
  - SCR
  - Technical provisions
  - MCR
  - Risk margin
  - Best estimate reserves (including TVOG)

Explicit prudence margin in minimum capital requirement and solvency capital requirement
Pillar 2
Expectations on firms

- Directive expects Firms to address and have in place six key “aspects” of governance based on conditions and functions:

- Pillar 2 requires firms to undertake an Own Risk and Solvency Assessment (ORSA)

- In addition to these requirements on firms, Pillar 2 also includes provisions for Supervisory review and action
Pillar 3
Reporting

Supervisory Reporting and Public Disclosure Requirements
CEIOPS Final Advice Doc 50/09 (former CP 58/09)

Public
- Solvency and Financial Condition Report (SFCR)
  - Public
  - Factual

Private
- Report to Supervisors (RTS)
  - Confidential
  - Future-oriented
  - Greater detail

Quantitative templates
Audit considerations
Strategic and Commercial Implications – Products
The Commercial and Product implications of Solvency II

The industry’s Solvency II attention has to date largely been on the 3 pillars, with predominantly actuarial focus on compliance and implementation. This is rapidly changing with an increased focus on the strategic and commercial implications, not withstanding the ongoing uncertainties in implementation dates, Internal Model approval and key technical issues.

Commercial, Product and Marketing Executives will need to shape and implement significant change arising from Solvency II.

Common emerging themes and questions include:

- New business strategy and product development decisions given Solvency II uncertainties
- The “right” set of metrics for managing the business, and the impacts on the product portfolio and business strategy
- The potential for competitive advantage or disadvantage under Solvency II given the different structures and strategies of individual companies
- The fear of being “behind the game” and out of line with key competitors
SII Commercial Implications – Key Questions

- Capital constraints - can current new business strategy be maintained?
- Are you introducing new metrics – product profitability, timelines, implementation?
- Is your Internal Model basis significantly more onerous than Standard Formula – impact on product pricing?
- Buffer capital – impact on pricing?
- Impact of SII uncertainties on key product lines - how to determine new business strategy and product development agenda?
- Capital optimisation strategies – reinsurance, ALM, product design, diversification etc
- Capital requirements and diversification – how do you compare to key competitors?
- Insured vs non-insured products – relative treatment under SII?
- Are you doing everything you need to be a winner under Solvency II?
- How will you manage to a capital budget?
Strategic & Commercial Implications of Solvency II

In principle,

- Large diversified insurance groups should survive and prosper, benefiting from their spread of risk, diversification benefits, brainpower, resource and budget
- Solvency II will be another driver for decisions, but may not change current strategies for markets and products
- Smaller mono-line players with more capital intensive products and limited diversification may find it increasingly challenging to compete successfully
Strategic & Commercial Implications of Solvency II

But there will be

► A lot of internal change and fine tuning to optimise and manage capital, e.g. in ALM, reinsurance, corporate structure
► Shifts in product offerings and pricing in the direction indicated by new risk adjusted metrics (and by the final Solvency II rules)
► More fundamental change if the organisation is particularly capital constrained, e.g. in new business strategies
► Direct regulatory requirements to satisfy within business areas (the Use Test)
► Additional incentives to divest capital intensive, complex and expensive legacy books or to acquire diversifying portfolios
Strategic & Commercial Implications of Solvency II

Which means (1/2)

► It will be very important to be at least as good at optimising the capital position as key competitors
► Marketing teams will have to learn to work with and provide leadership around a new set of metrics and constraints, which may lead to different strategic and tactical decisions
► Questions to be answered at every stage of the approval process about risk, capital requirements and risk adjusted return - hence pricing areas need the tools and capabilities to be fully on top of this
► Challenges on why certain lines of business are / are not being written, depending how they contribute to overall risk diversification and capital optimisation
Strategic & Commercial Implications of Solvency II

Which means (2/2)

► Understanding the potential risk and capital profiles of portfolio and plans, sensitivity to mix of business and market pricing is crucial and means a robust and Marketing-friendly projection model is essential

► There is potential for the Internal Model basis to be onerous when considered at individual product level - essential to be able to understand and challenge this

► There may well be a strong flow of big deals to banks and reinsurers as groups look to optimise and adjust risk profile and capital

The implications of Solvency II in this presentation are draft only; there are ongoing debates and consultation on most aspects of Solvency II
Developing a Commercial Strategy under Solvency II

Baseline - Current State and SII Impacts
- Starting point - current Pillar I and II balance sheet
- Solvency II impacts - QIS5 Std Formula and latest Internal Model
- Solvency ratio – constraints on business?
- Current risk profile and level of diversification
- Sensitivities – impact of key Solvency II uncertainties
- IMAP risk?
- Benchmarking?

Projection – Impact of Solvency II on Products and New Business capital requirements
- Current New Business strategy
- Product level SII capital requirements
- Projected solvency position
- Sensitivity tests – impacts of Solvency II uncertainties, market pricing
- Capital constraints on new business?
- Revisit new business plan – what will you do if...?

Context – External market Internal change
- External context – are key competitors better placed under Solvency II, do they have additional capital reduction options, how will market pricing respond?
- Internal context - impact of new metrics, level of capitalisation, allocation of diversification, possible changes in strategic investment, new risk and capital approval processes, impact of capital optimisation actions

Key factors - Identify key commercial issues
- Identify the key areas of strength / weakness – eg product issues, IM basis issues, level of diversification, exposure to Solvency II uncertainties
- What is the likely range of outcomes given Solvency II uncertainties
- Options available – does this strategy need revisiting or is it fine tuning only?
- Board level communication and discussion

Action – Strategy Development and Short term actions
- Develop “most likely” capital optimisation strategies
- Pursue these where possible, build optimisation capability where necessary
- Develop and manage product level impacts and decide need for immediate action or possible future action on price and product
- Board level communication and discussion

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/
Commercial strategy development - why now?

► Pricing decisions on some products are already being made with an eye on possible adverse outcomes of Solvency II for some products, particularly annuity business.

► New metrics for some groups are embedded in planning cycles and in some cases are already being run in parallel - these need to be fully understood before targets become “hard”.

► Internal Model bases are emerging and developing, including the allocation of capital, diversification benefits and buffer allowances – these may have significant impacts on new business capital requirements and pricing which need to be understood and debated.

► Some companies are aggressively pursuing de-risking and capital optimisation strategies where possible, or at least considering how they can best prepare for these activities as rules become clear - these could become a source of competitive advantage.

► There may be changes to product design which are required to avoid onerous impacts of Solvency II - have these been identified?
Solvency II: Pricing and product optimisation

The key issues to consider:
- The impact of Solvency II capital requirements, compared to current bases used in pricing
- Technical issues such as the interpretation of contract boundaries and EPIFP
- The allowance made for illiquidity premium in pricing and profitability analysis
- The impact of diversification benefits and capital buffers on product capital requirements, and the assumptions used to project them over time
- Taxation changes and the impact on individual product proposition and profitability
- Risk transfer and reinsurance arrangements, to optimise capital at product level
- Product level modelling methodology: e.g. projections of SCR and Risk Margin in profit tests
- Product governance requirements including requirements of the use test and consistency with the Internal Model

Why these are important:
- Having a lower capital requirement than your competitors provides you with competitive advantage
- This can be translated into a greater profit margin, or could be used to gain price advantage in attractive segments of the market, leading to greater sales and a larger market share
- Having an in-depth knowledge of how your capital will behave is key:
  - How much diversification benefit will you have
  - What’s the profile of this benefit, and how does this change if your profitability changes, or your business mix alters
  - What can you do to increase the size of this benefit
  - Where are the opportunities to write more business, generate more value, but with less capital?

There are multiple potential impacts of Solvency II on pricing and products, and scope for capital optimisation through product design

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong www.actuaries.org/HongKong2012/
Market view - Expected Product Impacts
2010 EY survey results

Key messages

► Traditional Annuity business has received the most detailed attention from providers to date

► General expectation that expected adverse impact on capital requirements would be offset at least to some extent by changes in price

► Solvency II not seen as a major driver of annuity volumes (other factors more important) unless for example capital constraints mean some companies were to exit the market

► Possible shift towards investment linked annuities given the capital consequences of guarantees.

► On protection business general expectation of some positive impact on capital requirements

► Other changes at the same time may also have a significant effect, eg tax changes, gender ruling

► Impacts on reinsurance unclear as yet - reduction in reinsurance use because of less regulatory arbitrage, but possibly more use of reinsurance to access diversification benefits and manage overall capital position.

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/
### Market view - Expected Product Impacts
#### 2010 EY survey results

#### Key messages
- General view of relatively little change in capital requirements for investment and pension products, although much depends on details of product and corporate structure.
- Guarantees likely to be a key issue, with possible drivers to product redesign, product de-risking or review of hedging and reinsurance arrangements.
- Variable annuities a particular area of focus given additional regulatory requirements.
- Significant constraints on actuarial resource and development budget is likely to limit new product development whilst organisations were delivering Solvency II.

#### Investment

<table>
<thead>
<tr>
<th></th>
<th>Capital requirement</th>
<th>Profitability</th>
<th>Price</th>
<th>Lapses</th>
<th>Sales volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Medium positive impact</td>
<td><img src="image1" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low impact / No change</td>
<td><img src="image2" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High / Medium negative impact</td>
<td><img src="image3" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Know</td>
<td><img src="image4" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Pensions

<table>
<thead>
<tr>
<th></th>
<th>Capital requirement</th>
<th>Profitability</th>
<th>Price</th>
<th>Lapses</th>
<th>Sales volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Medium positive impact</td>
<td><img src="image5" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low impact / No change</td>
<td><img src="image6" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High / Medium negative impact</td>
<td><img src="image7" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't Know</td>
<td><img src="image8" alt="Graph" /></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/
Market view - Expected Product Impacts
2011 EY survey results - outlook for annuity business more positive...?
## Product Impacts - Key SII uncertainties (1/2)

<table>
<thead>
<tr>
<th>Area of Uncertainty</th>
<th>Next Steps / Mitigation</th>
<th>Impacted Product Line</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transitional Arrangements</strong></td>
<td>➤ In the UK most companies are proceeding with SII programmes, based on current deadline (1/1/13)</td>
<td>All business impacted by overarching arrangements</td>
</tr>
<tr>
<td></td>
<td>➤ However, certain key decisions are being deferred, e.g. in areas of uncertainty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ Market practice will become clearer over the remainder of 2011</td>
<td></td>
</tr>
<tr>
<td><strong>Liquidity Premium / Matching Premium</strong></td>
<td>➤ EIOPA and Groupe Consultatif discussing inclusion of matching and liquidity premium</td>
<td>Could impact many lines of business, but far more material for annuity business than other lines</td>
</tr>
<tr>
<td></td>
<td>➤ Adoption of Level 2 should confirm existence, but might not confirm calibration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ Important for firms to understand sensitivity of business to liquidity premium</td>
<td></td>
</tr>
<tr>
<td><strong>Contract Boundaries</strong></td>
<td>➤ Issue is high on EIOPA, FSA and ABIs issue list, but may not have favourable resolution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ Product terms should be analysed to consider potential impacts and options for existing business and new business</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➤ Worth understanding sensitivity of balance sheet to different approaches to contract boundary (including current IASB definition in IFRS 4 ED)</td>
<td></td>
</tr>
</tbody>
</table>

- **Impact on Product Line**
  - All business impacted by overarching arrangements
  - Could impact many lines of business, but far more material for annuity business than other lines
  - Protection business could be impacted most materially. Future premiums and risk charges on linked business possibly impacted too, although appear to be excluded in latest EIOPA paper.

- **Transitional Arrangements**
  - Timetable for finalisation of rules and guidance not entirely clear
  - It is possible that aspects of Solvency II requirements will not be confirmed by 1 January 2013
  - Firms may still be required to produce Solvency I results at end 2013, possibly in parallel with Solvency II

- **Liquidity Premium / Matching Premium**
  - Inclusion of liquidity premium has support, but some argue it is not market consistent
  - QIS 5 included liquidity premium, although this was included across many product lines
  - Debate now focused on “matching premium”

- **Contract Boundaries**
  - Ambiguity exists over the definition of contract boundary. It differs from the IASB definition
  - Result might be that Insurer would be ‘off-risk’ sooner, with certain “economic” liabilities excluded
  - Risk that firms start changing contracts terms and conditions
### Product Impacts - Key SII uncertainties (2/2)

<table>
<thead>
<tr>
<th>Uncertainties</th>
<th>Area of Uncertainty</th>
<th>Next Steps / Mitigation</th>
<th>Impacted Product Line</th>
</tr>
</thead>
</table>
| IMAP Approval | ▶ FSA has changed approach to IMAP process and now focuses on large firms  
▶ Other firms need to meet same standard but will rely more on independent validation (external to FSA) | ▶ Internal Audit functions and external auditors are playing a leading role in model validation  
▶ Risk that model is not approved, hence many firms modelling standard formula as a contingency option  
▶ Validation could impact ultimate calibration | All business impacted. Ultimate design of the internal model fundamentally influences optimisation and arbitrage opportunities |
| Expected Future Profits in Future Premiums (EPIFP) | ▶ Expected profits arising from future premiums makes up a large amount of capital on some companies balance sheets  
▶ Not clear if EPIFP will count as Tier 1 capital | ▶ Industry is lobbying for inclusion in tier 1. Indications are that this argument will win favour  
▶ Firms could investigate ways of recognising VIF through securitisation or reinsurance | All business receiving future premiums is impacted. Profitable protection and linked business in particular. |
| Deferred Tax: Classification in Capital Tiering | ▶ Deferred tax assets have been treated as tier 3 capital in the draft level 2 implementing measures  
▶ This is despite being resilient under stress | ▶ Industry is lobbying for inclusion in tier 1  
▶ Compromise might be that firms demonstrate that some deferred tax assets are sufficiently resilient and these are recognised | Deferred tax liabilities and assets could be generated by all product lines |
| With-profits liabilities and capital requirements | ▶ Market practice is still emerging as to the treatment of with-profits business on the balance sheet – in particular the risk margin and capital requirements.  
▶ Risk margin approach is important for many Mutuals | ▶ Issues are different for proprietary companies and Mutuals, Some issues are presentational only  
▶ Pillar 3 consultations might help, but little assistance so far  
▶ Important to understand developing practice | Impacts balance sheet for with-profits business |
Solvency II Product Impacts – Protection

Detailed work we have performed for one insurer’s Protection portfolio showed there is potentially some advantage to be derived from Solvency II compared to current pillar 1 basis, i.e. improved capital efficiency especially in early years of contract.

However for another insurer we found there to be an increase in total capital requirements, mainly as a result of the Risk Margin.

In general the position for protection business will be highly dependent on a number of factors including:

► The type of business, with large differences between Life, CI, IP
► Internal model basis compared to standard formula
► Final Solvency II rules
► Other business the company writes (diversification)
► Strength of current reserving and capital bases
► Product design and reinsurance arrangements (including internal reinsurance)
► The level to which the company wants to capitalise
► The definitions of EPIFP, Contract Boundaries, etc.
► There is clear scope for optimisation of reinsurance arrangements

Hence the need for detailed modelling of an insurer’s own products and reinsurance arrangements
Solvency II Product Impacts – Traditional Annuities

Potential significant additional capital requirements, although there remains a high degree of uncertainty. Key issues - allowance for illiquidity premium, risk margin and capital requirements for spread, longevity and interest rate risk.

Mainstream annuity players have taken a variety of approaches to the uncertainties:

► Some are actively investigating possible capital optimisation solutions and engaging heavily with the regulators. This is geared to both capital reduction for existing portfolio and achieving pricing benefits
► Some providers do have optimisation solutions identified contingent on the outcome of the Solvency II rules e.g. in the QIS5 scenario
► Some providers are considering wider balance sheet solutions e.g. branch or central reinsurer to improve diversification
► Some have re-priced their annuity business to reflect expected outcomes around limited illiquidity premium. We believe other providers will be looking for further opportunities to do this

► Other groups consider the possible solutions to be so dependent on final rules that they consider it too early to do much detailed work in this area
► Other groups we have worked with who have a product mix with a lower annuity focus are largely in the process of detailed modeling and understanding of Solvency II at product level and how the profitability and capital efficiency of their products look on their internal model basis and risk adjusted metrics – they have not yet taken any steps to redesign or optimise their position

Source – EY estimates – Model annuity portfolio
Key Product Issues
Reassessment of key profitability metrics (1/2)

Some insurers considering introducing new performance metrics, with a range of measures under consideration. There is likely to be a lengthy implementation period, with parallel consideration of old and new metrics prior to embedding in annual planning cycles.

In some cases, certain products appear significantly less profitable than under existing metrics

<table>
<thead>
<tr>
<th>Categories</th>
<th>Traditional Measures</th>
<th>Examples of new measures under consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>EV Value of New Business</td>
<td>Solvency II Profit (Change in Own Funds), or Economic Profit (SII Profit less PV of capital x required return)</td>
</tr>
<tr>
<td>Return on Capital</td>
<td>IRR</td>
<td>(Ra)RoC (Economic Profit / PV Capital)</td>
</tr>
<tr>
<td>Capital Efficiency</td>
<td>Payback period (cash or capital, discounted or undiscounted)</td>
<td>Payback period</td>
</tr>
<tr>
<td>Performance</td>
<td>IFRS Profits</td>
<td>IFRS Profits</td>
</tr>
<tr>
<td></td>
<td>EV Profits</td>
<td>Net Cashflow</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SII Profit over 5 year period</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td>SII or Risk Capital (i.e. internal measure of economic capital)</td>
</tr>
</tbody>
</table>
Reassessment of key profitability metrics (2/2)

Key messages
► The standard metrics of Discounted profit margin, IRR and payback period are currently most common
► There are some differences between companies in the definitions of discounted profits (EEV, MCVNB, “risk adjusted”) and the capital allowed for
► An insurer has moved to the “Disc Profit as % of Required Capital” metric which includes a risk adjusted profit measure
► The Post Solvency II responses show some further planned changes, with more mentions of IFRS earnings and also mentions of Economic Profit and Risk Capital

Many insurers are considering economic profit or solvency II profit type measures and are in the process of understanding initial results on these bases
Diversification benefits become a key commercial “asset”

QIS5 Results overview

- The graph below shows a breakdown of the components in the Final SCR
- The adjustment for loss absorbency (in respect of technical provisions and deferred tax) has a relatively significant impact averaging approx. 60% of the Final SCR
- The table alongside provides a split of the diversification impact within and between modules (expressed as a percentage of the Final SCR)

Note:
- The starting SCR is the sum of all SCR components without any allowances for diversification between risks
- The ‘Total Diversification’ is the diversification effect within and between risk modules. The result reflects the BSCR (approximately 145%)

| SCR components (averaged across all companies), expressed as % of Final SCR |
| Sum of SCR components (pre-diversification) | Total diversification (as a % Final SCR) | Operational risk | Adj for loss absorbency (TP) | Adj for loss absorbency (deferred tax) | Final SCR |
| 248% | -100% | -40% | -23% | -100% |

- BSCR = 145%
- Diversification as % of Final SCR Average
  - Within modules -64%
  - Between modules -36%
  - Total diversification -100%

Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/
Capital buffers may have a significant potential impact on pricing

- The allowance for buffer capital in excess of Solvency II requirements is an emerging issue for pricing teams. Most insurers have not yet determined their approach to this issue, but are concerned about the pricing implications.
- From published information below (2009), several large groups calibrate their internal economic capital measures to a higher level than required by Solvency II.
- We have very roughly estimated that a 99.9% internal model calibration could translate into capital requirements of 120-150% of Solvency II requirements.

<table>
<thead>
<tr>
<th>Companies</th>
<th>Confidence Level</th>
<th>Ruin Measure</th>
<th>Return Measure</th>
<th>S&amp;P Financial Strength Rating (at 30th September 2009)</th>
<th>Diversification by business segments</th>
<th>Diversification by risk segments</th>
<th>Diversification by geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aegon</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Allianz</td>
<td>99.97%</td>
<td>1 year VaR</td>
<td>EVA</td>
<td>AA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Aviva</td>
<td></td>
<td></td>
<td>ROE, ROCE</td>
<td>AA-</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>AXA</td>
<td>99.97%</td>
<td>1 year VaR</td>
<td>ROEV</td>
<td>AA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>CNP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eureka</td>
<td>99.95%</td>
<td>1 year VaR</td>
<td>ROE, ROAE</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Fortis</td>
<td>99.97%</td>
<td>1 year VaR</td>
<td>ROE</td>
<td>AA</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Friends Provident</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>ROE</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Generali</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>ROE, ROEV</td>
<td>AA</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Hannover Re</td>
<td>99.97%</td>
<td>1 year VaR</td>
<td>ROE, ROACE, xROCA, RORAC</td>
<td>AA-</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSBC</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>ROE, ROAIC</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>ING</td>
<td>99.95%</td>
<td>1 year VaR</td>
<td>ROE, RAROC</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>KBC</td>
<td>99.96%</td>
<td>1 year VaR</td>
<td>ROE, ROAC</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Legal &amp; General</td>
<td></td>
<td></td>
<td>ROE</td>
<td>AA</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lloyds Banking Group</td>
<td></td>
<td></td>
<td>ROE, ROEVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Munich Re</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>RORAC</td>
<td>AA-</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Old Mutual</td>
<td>99.93%</td>
<td>1 year VaR</td>
<td>ROE, ROCEV, ROAC</td>
<td>A-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prudential</td>
<td>99.50%</td>
<td>1 year VaR</td>
<td>ROE</td>
<td>A-</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SNS Reaal</td>
<td>99.96%</td>
<td>1 year VaR</td>
<td>ROE, RAROC</td>
<td>A-</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Standard Life</td>
<td></td>
<td></td>
<td>ROE</td>
<td>A+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storebrand</td>
<td></td>
<td></td>
<td>ROE</td>
<td>BBB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swiss Re</td>
<td>99.00%</td>
<td>1 year Tail-VaR</td>
<td>RORAC</td>
<td>A+</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vienna</td>
<td>99.95%</td>
<td>1 year VaR</td>
<td>ROE</td>
<td>A-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zurich Financial Services</td>
<td>99.95%</td>
<td>1 year VaR</td>
<td>ROE</td>
<td>AA-</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Not disclosed
# Singapore RBC risk shocks vs. QIS5 risk shocks

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Singapore RBC</th>
<th>Solvency II QIS5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>Equity specific risk: 8%, Equity general risk: 8%, % of market value of each equity position or net position by country</td>
<td>Global equity: 30%, Others (incl. Singapore): 40%, An immediate decrease % of equity market value</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Absolute shock: 0.6% - 1% by maturity year, shocked rate floored at 0%, upward or downward shock on the term structure of interest rate</td>
<td>Upward: 25% - 70% by maturity year, Downward: 30% - 75% by maturity year, Instantaneous upward or downward shock on the term structure of interest rate</td>
</tr>
<tr>
<td>Lapse</td>
<td>Lapse increase/decrease: +25%/-25%</td>
<td>Permanent lapse increase: 50%, cap at 100% lapse rate, Permanent lapse decrease: 50%, absolute change cap at 20%, Mass lapse: 30% for policies with surrender strain, 70% for non-retail business</td>
</tr>
<tr>
<td>Longevity</td>
<td>Mortality improvement: 5 year setback</td>
<td>Permanent mortality decrease for each age: 20%</td>
</tr>
<tr>
<td>Mortality</td>
<td>112.5% or 125% of insurer’s best estimate</td>
<td>Permanent mortality decrease for each age: 15%</td>
</tr>
</tbody>
</table>
Statistical study: Singapore RBC vs. QIS 5 shock levels
(Diversification impact not considered)

Key observations
► Based on the Dec 2010 QIS5 basis given this represents an observable, tested set of data
► Most RBC and QIS5 prescribed shocks fall below the 99.5% Confidence Level (CL)
► QIS5 prescribed-shocks provide higher CLs compared to RBC shocks except for mortality and longevity risks
► Although the size of QIS5 risk shocks is not directly relevant to Singapore market experience, risk calibration could give clearer “confidence” to Singapore
Solvency II Product Impacts

Simplified Case Study
Solvency II Product Impacts ... a simplified case study

► A simplified case study is carried out to analyse the impact of product features and mix on Solvency II capital
► In this simplified case study, we have assumed an insurance company with only two products, one universal life and one term life, with features commonly found in the Asian markets
► The case study focuses on the creation of shareholder value and the returns on shareholder capital
  ► This is calculated based on the MCEV and Solvency Capital at the time of inception
  ► The objective is to maximize the shareholder value creation
  ► A risk-adjusted return on capital approach is also utilised
Simplified Case Study

Risks considered

\[ \text{SCR} = \text{BSCR} + \text{Adj} + \text{Op Risk} \]

- **SCR\text{market}**
  - **Mkt\text{fx}**
  - **Health\text{SLT}**
- **SCR\text{health}**
  - **Mkt\text{prop}**
  - **Health\text{Mort}**
  - **Mkt\text{int}**
  - **Health\text{Long}**
  - **Mkt\text{eq}**
  - **Health\text{Dis}**
  - **Mkt\text{sp}**
  - **Health\text{Lapse}**
  - **Mkt\text{conc}**
  - **Health\text{Exp}**
  - **Mkt\text{ip}**
  - **Health\text{Rev}**

- **SCR\text{def}**
  - **Health\text{NonSLT}**
  - **Health\text{CAT}**

- **SCR\text{life}**
  - **Life\text{Mort}**
  - **Life\text{CAT}**
  - **Life\text{Long}**
  - **Life\text{Dis/Morb}**
  - **Life\text{Lapse}**
  - **Life\text{Exp}**
  - **Life\text{Rev}**

- **SCR\text{non-life}**
  - **NL\text{PremandRes}**
  - **NL\text{CAT}**

- **SCR\text{intang}**
  - **NL\text{Lapse}**

\( \text{Adj} = \text{adjustment for the risk mitigating effect of future profit sharing} \)
Simplified Case Study
Illustrative product features – universal life

Universal Life

► Premium payment term: 10 years
► Benefit term: whole life
► Death Benefit: Sum Insured - Account Value
► Sum Insured = 10 x Premium
► Fee structure:

<table>
<thead>
<tr>
<th></th>
<th>Yr1</th>
<th>Yr2</th>
<th>Yr3</th>
<th>Yr4</th>
<th>Yr5</th>
<th>Yr6 +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Loading (% premium)</td>
<td>50%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Admin Fee ($)</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Management Fee (% FUM)</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Surrender Charge</td>
<td>10%</td>
<td>8%</td>
<td>6%</td>
<td>4%</td>
<td>2%</td>
<td>0%</td>
</tr>
</tbody>
</table>

► Surrender Benefit = AV - Surrender Charge
► Persistence Bonus of 2% of premium from year 6
► Guarantees
  ► Minimum credited rate: 2%
  ► No lapse guarantee
Simplified Case Study
Illustrative product features – term life

Term Product

- Premium payment term: 10 years
- Benefit term: 10 years
- Death Benefit: $1,000,000
- Pricing rate: 3% (flat)
- Illustrative annual premium: $818 for a standard risk, 35-year old Male
- Surrender Benefit: None
- Persistence Bonus: None
- Other guarantees
  - None
Simplified Case Study
Modeling approach – technical setup (1/3)

► The case study is done with an Microsoft Excel based model, with VBA macro

► The MCEV is calculated using the income statement approach
  ► It is the Present Value of Future Profits (PVFP) - Time Value of Options and Guarantees (TVoG) - Cost of Non-hedgeable risks (CNHR) - Cost of Capital (CoC) + Adjusted Net Asset Value (ANAV)
  ► i.e. MCEV = PVFP - TVoG - CNHR - CoC + ANAV

► Solvency II technical provision
  ► Best Estimate Liability + Risk Margin
  ► For Universal Life, the Best Estimate Liability includes the cost of minimum credited rate and cost of no lapse guarantee
Simplified Case Study
Modeling approach – technical setup (2/3)

► The costs of minimum credited rate and no lapse guarantee for the universal life product are projected through the use of constant factors applied to selected risk drivers
  ► The constant factor is determined at issue and is kept the same throughout the projection period
► The risk driver for the minimum credited rate uses the Black Scholes value as a proxy, whereby:
  ► $S$ = current account value
  ► $X$ = current account value accrued at the guaranteed rate to policy term
  ► $T$ = Policy term (persistency adjusted)
  ► $\sigma$ = portfolio implied volatility, based on underlying asset mix, with no correlation
  ► $r$ = spot rate corresponding to swap rate and policy term
Simplified Case Study
Modeling approach – technical setup (3/3)

► The risk driver for the no lapse guarantee is the actuarial present value of the death benefits paid after the Universal Life account balance goes to down under the best estimate scenario

► For the calculation of the SCR, the 99.5% shock levels and the correlation factors are based on the values prescribed in the QIS 5 technical specifications

► For the term life product, catastrophe risk is also included in the SCR calculation

► The risk margin is computed as 6% of the future SCR, discounted at the risk free rate

► The actuarial assumptions used are standard industry assumptions; no dynamic policyholder behaviour is modelled
Universal Life

The product is profitable under a real world basis, with an IRR of about 12%

While it is important to study the pricing results in both real world and market consistent basis, this presentation focuses solely on a market consistent valuation

Under the current low interest rate environment, the market consistent pricing shows that a barely positive MCVNB basis for the 2% minimum guarantee rate Universal Life product with a no lapse guarantee
  
  Note that we have assumed no liquidity premium in the projections

The resulting Solvency II capital also shows a significant capital charge

In coming slides, we show the impact of product design changes
Simplified Case Study
Universal Life – guarantee minimum credited rate

► In order to maximize the shareholder (SH) value, we have utilized a measure defined as “MCVNB / Solvency Capital”
► The numerator MCVNB represents the value created by new business
► The denominator Solvency Capital required represents the capital required to support the new business (without taking into account any diversification or aggregation benefits)

The long-term guarantee nature of the minimum credited rate is a capital-intensive feature.

Impact of Min Guarantee Rate

The long-term guarantee nature of the minimum credited rate is a capital-intensive feature.
Simplified Case Study
Universal Life – asset mix

- Keeping everything else the same, introducing equity into the mix of assets supporting the Universal Life product decreases SH value
- Under Solvency II, the higher volatility from the equity market results in a higher capital charge
- This is when studying the pricing measures under both bases become valuable

If equity results in a higher capital charge, why are they still used to support the product?
Simplified Case Study
Universal Life – level of COI charge

► The level of COI charges assessed on the net amount of risk is also varied to study its impact
► The impact is as expected, increasing the level of COI charge increases SH value ... keeping everything the same
► The study has NOT considered the impact of this to sales volume, etc.

Impact of changing COI Charge

How much room there is within the UL product for an insurer to increase the COI charge?

[Graph showing the impact of changing the COI charge on MCVNB/SCR]
Simplified Case Study
Universal Life – no lapse guarantee

► For completeness, we also studied the impact of offering no lapse guarantee (NLG)
► Depending on the target market of the Universal Life product, this feature may not be as highly valued by some
► Providing a no lapse guarantee over the lifetime of the policyholder can be a very costly feature under Solvency II

There are also other ways to bring down the NLG cost, such as limiting the NLG term or prescribing other NLG requirements (minimum premium or shadow account)
Simplified Case Study
Term Life

▶ For the term life product, there is no embedded options and guarantees so the pricing is easier
▶ The increase in the SCR is non-linear as the duration of the term product increases
▶ Does the premium rate increase fast enough to compensate for the additional capital charge?

How likely are insurers in Asia able to source the long-term bonds necessary to support the term product?
Simplified Case Study
Universal Life vs. Term

► The simplified case study "scratches the surface" on what insurers can do in formulating its product strategies under Solvency II

► There are other areas (not covered in the study) that should be considered:
  ► The impact of aggregation and diversification
  ► The level of local regulatory capital vs. Solvency II
  ► The use of reinsurance or other risk management tools in managing undesirable risks
  ► The parameters used in determining the SCR
  ► How the product fits into an insurer's overall strategy
  ► etc.

► While some of the product design changes have minimal impact, the cumulative impact of aggregated changes can be significant
IFRS 4 Phase II … comparing to Solvency II
Addressing IFRS 4 Phase II requirements alongside Solvency II

A final standard for IFRS 4 is expected in 2012. If this occurs, it will require amendment to the systems and processes being developed to address Solvency II.

Key considerations:
- Maintaining sufficient flexibility in the modelling tools is essential as both IFRS and Solvency II requirements evolve during the implementation window
Comparison between Solvency II and IFRS 4 Phase II

The starting point for Solvency II and IFRS 4 Phase II is the same – an economic, market-consistent approach to the valuation of assets and liabilities.
### Technical alignment between IFRS and Solvency II

<table>
<thead>
<tr>
<th>Reporting Base</th>
<th>Probability weighted cashflows</th>
<th>Options and guarantees</th>
<th>Recognition</th>
<th>Overheads</th>
<th>Income taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IFRS 4 Phase II</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Inception</td>
<td>Attributable only</td>
<td>Excluded</td>
</tr>
<tr>
<td><strong>Solvency II</strong></td>
<td>Yes (contract boundary may differ)</td>
<td>Yes</td>
<td>Earlier of signing or inception</td>
<td>Yes</td>
<td>Excluded</td>
</tr>
</tbody>
</table>

- **Present value of fulfillment cashflows (IFRS Phase II)**
- **Technical provision (Solvency II)**

<table>
<thead>
<tr>
<th>Reporting Base</th>
<th>Discount rate</th>
<th>Unbundling</th>
<th>Risk margin</th>
<th>Residual margin</th>
<th>Short duration model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IFRS 4 Phase II</strong></td>
<td>Characteristic of liab</td>
<td>Yes</td>
<td>Yes (prescribes 3 methods)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Solvency II</strong></td>
<td>Risk free plus liquidity premium</td>
<td>No</td>
<td>Yes (only permits cost of capital)</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Unbundling under IFRS 4 Phase II

Exposure Draft

► An insurer should unbundle components of a contract that are not closely related to the insurance coverage specified in that contract.

► Examples:
  ► Embedded derivatives
  ► Components that are unbundled should be accounted for using other applicable standards (such as the financial instruments standard).

Update

► Decisions from the joint meeting on 21 March 2012 show that the IASB/FASB are now moving towards measuring the entire contract liability under the insurance model. This represents a dramatic change from the earlier unbundling discussions.
In accordance with the ED, a universal life contract should be **unbundled** into **Insurance component** and **Investment component**.

**Note:** this may have been superceded by the decisions from the IASB/FASB joint meeting in late March.

**Method 1:** All policy charges and expenses are unbundled to the **insurance component**.
- > COI
- > Surrender charge
- > Premium load
- > Management fee
- > Commission expense
- > Acquisition expense
- > Maintenance expense

**Method 2:** Only the COI charge is unbundled to the **insurance component**. All other policy charges and expenses are unbundled to the **investment component**.
- > Surrender charge
- > Premium load
- > Management fee
- > Commission expense
- > Acquisition expense
- > Maintenance expense

**Joint IACA, IAAHS and PBSS Colloquium in Hong Kong**
www.actuaries.org/HongKong2012/
Unbundling – illustration of Universal Life product
Observations (1/2)

Insurance Component
Due to lower expense margin, Method 2 yields a higher profit margin as compared to Method 1.

Investment Component
Method 2 produces a volatile profit pattern due to the varied expense margins throughout the premium paying period.

Note: this may have been superseded by the decisions from the IASB/FASB joint meeting in late March.
Unbundling – illustration of Universal Life product
Observations (2/2)

Total contract = Insurance component + Investment component

- No unbundling produces the smoothest profit emergence
- Profit pattern of the investment component fluctuates significantly when unbundling most charges and expenses into investment component
- The issue of unbundling goods and services and account balances still remains

Note: this may have been superceded by the decisions from the IASB/FASB joint meeting in late March
Questions?

tze-ping.chng@hk.ey.com

thomas-hy.tang@hk.ey.com