Emerging Risks or Black Swans?

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Session Number: TBR12
Emerging Risks or Black Swans?

Looking back on 2011, where are we?

While we think we have finally adapted to the ‘new normal’ and sustained low interest rate levels…

- US Government’s Rating Downgrade on 5 August 2011 – interests dropped
- All 3 major U.S. stock indices declined 5-7% in one day
- Cost to insure U.S. debts against default up from 25bps to 75bps
- European debt crisis, Euro zone leaders agreed on package of measures designed to prevent the collapse, October 2011
- US credit spread surged by almost 50% right at Q3 2011
- Extreme stock market volatility and global instability
- Consumer confidence remains at historical lows
- “Inflation as a continuing concern….” (Asian Development Bank)
- Greece weaving through the debt crisis...
### Emerging Risks or Black Swans?

**Worries and achievements...abiding memory**

| ✔ | Successfully seek yield enhancements and improve ALM metrics? |
|   | Increased total balance sheet volatility? |
|   | Running frequent solvency ratios for regulators’ need? |
|   | Worrying about product guarantees and devising strategies? |
|   | RMB market: who still does not have a RMB product by now? |
|   | Expand scope to better operational risk management? |
|   | More complicated actuarial models? |
|   | Meeting Group requirements and up-to-date with regulations? |
|   | Feeling confident for Solvency II readiness? |
|   | Submission, filing and disclosure? |
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According to the Actuaries

Downside Tail Risk occurs every 100 years
• One such event occurred in 2008 Q4
  ➢ Equity Market dropped by 20.1%
  ➢ US 10-year Interest Rates at 2.25%
  ➢ HK 10-year Interest Rates at 1.19%

Well it Happened Again within 3 years!
• Second such event occurred in 2011 Q3
  ➢ Equity Market dropped by 21.5%
  ➢ US 10-year Interest Rates at 1.92%
  ➢ HK 10-year Interest Rates at 1.27%

Will it happen again soon? … lets look at trends
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Lowest ever US interest rates

U.S. 10-Year Treasury Constant Maturity Rate
Source: Board of Governors of the Federal Reserve System

Historical Average 6.25%
In last 20 years 5.09%
In last 10 years 4.01%
31-Jan-2012 1.83%
31-March-2012 2.23%
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Hong Kong interest rates are even lower

Yield on 10-Year Government Bonds

As of 2012 March
United States 2.23%
Hong Kong 1.38%

As of 2006 Q2
United States 5.15%
Hong Kong 4.83%
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The newer normal redefined?

![Graph showing SP500 Qrtly Return vs US 10Yr Rel Qrtly Change with Q4 2008, Q3 2011, Q4 2011, and Q1 2012 highlighted.](image-url)
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Reflecting the top life insurance risk responses...

• Capital: the critical source
  – Capital efficiency, allocation and return
  – In some countries, dealing with asymmetric sensitivities (csv floor, prem def)
  – In others, liability reflects MV => TBS volatility completely driven by economy
  – Some with net premium under regulated valuation rate
  – Impact of balancing credit risk via de-risking
  – Capital management with regular stress testing

• Product: the right strategy
  – New product management: design and pricing
  – VUL hanging to equity optimism, troubled of too much a focus
  – In-force business management
  – Disciplined discretionary benefits determination process

• Inappropriate to assume Tail 3 will hit only in 2112
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Shifting risk appetite?

• Changed distribution with tail events gaining higher probability
  – Maintain target economic capital adequacy following a 1-in-X year event?
  – Earnings has low probability (e.g. 20%) of being >15% below plan?
  – Enterprise value has low probability (e.g. 15%) of falling by 10%+?

How management reacts and feeds back to the components:

Fear of tails?
Feedback from executives / board on response to real event and recalibrate

Normal expected volatility excluding events and prepare to explain tails when they happen
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Addressing views of different stakeholders

Risk appetite metrics
- Time-point value measure vs. Flow value measure
- Accounting vs. Economic
- Short vs. medium term

A multi-dimensional view of risk is favoured
But multitude of measures can constrain business decisions
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Exposure vs. limit

<table>
<thead>
<tr>
<th>Risk type</th>
<th>Business Group A</th>
<th>Business Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit 1</td>
<td>Unit 2</td>
</tr>
<tr>
<td>Major risk exposures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
<td>50%</td>
<td>90%</td>
</tr>
<tr>
<td>Equity</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Foreign exchange</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Default</td>
<td>65%</td>
<td>75%</td>
</tr>
<tr>
<td>Mortality</td>
<td>45%</td>
<td>60%</td>
</tr>
<tr>
<td>Longevity</td>
<td>20%</td>
<td>50%</td>
</tr>
<tr>
<td>Lapse</td>
<td>50%</td>
<td>35%</td>
</tr>
<tr>
<td>Additional in next year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morbidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underwriting</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>40%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Numbers are indicative for illustration purpose only

Aggregation

Re-allocation?
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Testing your appetite via sensitivities

- **Sensitivity**: incremental change in single risk factor performed on key risks with potential significant impact. Risk tolerance limits and early warnings.

- **Scenario testing**: hypothetical combination and ripple effects, more recent attention on emerging cases and reverse testing.

- **Reporting requirements**: e.g. DST – mandated, plausible, ripple effects.

- **ORSA**: dynamic, forward looking base case scenario, stresses reflect topical and relevant future to assess capita adequacy vs. appetite.

- **Harmonize process** for all tests to achieve consistency and efficiency.

- **Partnering, roles & responsibilities**: CRO, CA, CFO, AA
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Knowing vs. Not knowing

- Known knowns: things we know we know
- Known unknowns: things we know we do not know
- Unknown unknowns: do not know that we do not know

Donald Rumsfeld
Former US Secretary of Defense

Self-reflect: Are most of the risks unthinkable, or are we ignoring the thinkable and think they are distant?
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Black swan management in theory

*Nassim Nicholas Taleb (2007)*

1. a surprise and impossible to predict (to observer)
2. extreme impact
3. retrospective but not prospective predictability

- Call for emergency response and solution formation
- Enquiry and extra requirements from regulatory bodies
- People dynamics and negative impact on productivity
- Panic factor to impact decision making process

✔ Reverse stress-testing
✔ Actionable quantitative analysis
✔ Acknowledge model limitations
✔ Do not ignore the tail
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Black swan or Emerging risks?

Lies in the identification process...

- Remote and systemic
- Unthinkable
- Change with changing landscape
- Interconnected global financial system surprises
- Limited resource and too many priorities

Active
- Plausibility vs. possibility
- Thinkable but ignored
- Herd mentality
- Good time bad time theory
- Fundamental presumptions
- Quarter result focus

Focus only on what-can-go wrong to challenge your business but not what-can-go killing to end your business completely

We cannot be managing it if we do not intend to manage it.
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Currency de-peg risk case study: HKD/USD

- Hong Kong adopts a Linked Exchange Rate System with USD peg
- Policies issued primarily in USD/HKD denomination
- Lack of HKD long term investments to back HKD liabilities
- USD assets with 10/20-year USD T-yield as typical benchmark
- Common currency mismatch with mismatch reserves or hedges
- Currency mismatch risk tolerance limits apply
  - “Prudent provision shall be included”
  - “Zero allowance assuming a peg will never move in not prudent”
  - “Expected future cost of matching currency swap”
  - Same bases requires excess capital charge
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Some background history...

- 1935 - Abandoned silver dollar standard during crisis, linked to Pound @ £1: HKD16
- 1967 - revalued @ £1: HKD14.55
- 1972 - linked to USD1: HKD5.65
- 1974 - Free floating
- 1983 - depreciation and confidence crisis
- 1983 - USD1: HKD7.80
- 1997 - Handover to China
- 1998 - weak side commitment HKD7.75
- 2005 - strong side commitment HKD 7.75 and moved weak side to HKD7.85
- Resilience again external shocks recently...

Source: “Hong Kong’s Linked Exchange Rate System” – Hong Kong Monetary Authority.
http://www.info.gov.hk/hkma/eng/
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The Linked Exchange Rate System (LERS)

**CAPITAL INFLOW**
- Force HKD exchange rate down to be within target range
- HKD interest rates fall
- Currency Board sells HKD to expand monetary base
- Trigger strong side defense
- Market demand on HKD, upward pressure on HKD exchange rate

**CAPITAL OUTFLOW**
- Market sells on HKD to increase supply, downward pressure on HKD FX rate
- Trigger weak side defense
- Currency Board purchase HKD to contract monetary base
- HKD interest rate rise
- Upward pressure on exchange rate to be within target range
# Emerging Risks or Black Swans?

## Rationale of the link – taking it for granted?

<table>
<thead>
<tr>
<th></th>
<th>Past</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key trading partner?</td>
<td>United States</td>
<td>China, and others</td>
</tr>
<tr>
<td>Interest rate anchor?</td>
<td>&gt; 10%</td>
<td>&lt; 2%</td>
</tr>
<tr>
<td>International strength?</td>
<td>Strong position</td>
<td>Slugghish recovery</td>
</tr>
<tr>
<td></td>
<td>GDP growth 9%</td>
<td>GDP growth 2%</td>
</tr>
<tr>
<td>Business cycle</td>
<td>Very close</td>
<td>Divergent</td>
</tr>
<tr>
<td>synchronization?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monetary base?</td>
<td>Low intervention</td>
<td>Strong side intervention;</td>
</tr>
<tr>
<td></td>
<td>cost as FX stable</td>
<td>doubled from HKD507bn to HKD1011bn ’2008-2009</td>
</tr>
</tbody>
</table>

“Limitation: ...at times when the economic cycles of Hong Kong and the US may not necessarily be moving in tandem...If there is a misalignment ...may not be best suited to the macroeconomic conditions of the domestic economy.”

*Source: Hong Kong Monetary Authority*
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What are the “thinkable” outcome

- HKD float again?
- HKD/USD revalued?
- HKD peg to a basket?
- HKD/RMB to peg?

Factors of considerations:
- Transparency
- Simplicity
- Sustainability
- Trading partners
- Convertibility...

Not a question of if but a question of when
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Assessing the forces?

RMB liberalization journey

- 2003/4 HK became offshore RMB clearance centre
- 2007/8 Start of RMB bond market (‘‘dim sum bond’’)
- 2009 RMB trade settlement scheme for cross-border
- 2010 PBOC / HKMA entered agreement for interbank mkt
- 2011 PBOC pilot allow qualified domestics to use RMB for out-investments

RMB IPO…
MNC dim sum bonds…
More offshore centers…
Reserve currency…

Source: RBS

FX to indicative currencies (HKD per Currency)

Jan-09 Apr-09 Jul-09 Oct-09 Jan-10 Apr-10 Jul-10 Oct-10 Jan-11 Apr-11 Jul-11 Oct-11 Jan-12

USD anchor
CAD
AUD
RMB
SGD
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Inherited risks in all circumstances

- Immediate loss unlikely
- Hedge cost movements
- Reserve valuation rates
- Lower investment return for shareholders
- Lower dividends and crediting rates for policyholders
- Repricing, new design and denominations
- Inforce block management – investment / hedging strategies

Source: Bloomberg
Emerging Risks or Black Swans?

Getting prepared

• Assessing the potential financial impacts
  ➢ Reserve impact
  ➢ Solvency impact
  ➢ With and without hedge coverage
  ➢ Local, IFRS, other reporting bases

• Try single stresses and combined scenarios
  ➢ HKD appreciation by X%
  ➢ Hedge cost multiplied by n times
  ➢ US/HK spread widening, or HKD yield drops
  ➢ Capital injection?
  ➢ Shift in product mix?
  ➢ Sensitivity to hedge durations?
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So, are we fully prepared now...anything more?

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Financial risks</strong></td>
<td>- Different shocks to assets and liabilities leading to changes in net income and capital</td>
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<tr>
<td></td>
<td>- Unpredictable policyholder behaviour heightens liquidity needs over a short timeframe</td>
</tr>
<tr>
<td><strong>Operational &amp; IT risks</strong></td>
<td>- Set and execution of exchange rate or band</td>
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<tr>
<td></td>
<td>- Bulk transaction volume: system/resource capability issues</td>
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<tr>
<td></td>
<td>- Inadequate infrastructure to sufficiently handle various requirements</td>
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<tr>
<td><strong>Reputation risks</strong></td>
<td>- Distribution and/or customer expectations not fully met</td>
</tr>
<tr>
<td></td>
<td>- Pro-activeness in reacting to competitors’ responses</td>
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<td></td>
<td>- External communication</td>
</tr>
<tr>
<td></td>
<td>- Internal planning</td>
</tr>
<tr>
<td><strong>Product risks</strong></td>
<td>- Ability to maintain the existing product sales</td>
</tr>
<tr>
<td></td>
<td>- Sales tools and contracts</td>
</tr>
<tr>
<td><strong>Business model</strong></td>
<td>- Sustainable for traditional products?</td>
</tr>
</tbody>
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Concept of crisis management

3-stage concept:

Pre-crisis preparation

Building the team
Choose indicators
Define “event” – measurable
Define triggers on base + stresses
Regular tracking

During event:

Internal needs-to-know defined
How and what message
External communication
Local / Regional / Global

Post event

Frequent review
Continue monitoring
Smooth transitions
Debrief

Debrief
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Sample plan (pre)

- **Business rule**: Finance, Investments, Operations, IT
  - Frequency of spot rates / Fix or band width / Time to fix
  - Implementation to scenarios
  - Impact checklist and procedures / system enhancement
  - Application vendor

- **Product elements**: Marketing, Legal
  - Sales material and provision on guarantees
  - Careful handling of promises and potential disputes
  - MVA features in products

- **ALM checkpoints**:
  - Trigger monitoring and whistle blowing
  - Local bonds purchase capability and hedge position monitoring

- **Others**: accounting entries, distribution compensation
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Sample plan (at & post)

- Taskforce chairperson: declare event and activate procedures

- **Operations:**
  - Customer notification / Customer service training / Q&A templates
  - Staff sourcing plan
  - Policyholder behaviour changes
  - System triggers and user notification / Vendor standby mode

- **Business:**
  - Assess competitors’ response to market
  - Product line management and channel reactions

- **Financials:**
  - Movement on exchange rate / yields / hedge cost / credits
  - Capital impact and volatility

- **Line of communication** and seamless collaboration
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The Emerging risk radar

**Extreme thoughts....**
US downgrade further
Eurozone breakdown
Interest rate goes below 1%
Product flaws
Exemptions no longer available
Radical change to solvency regime
Significant reputation scandal
Fundamental model error
Flight to safe credits in plan unavailable
Hyperinflation
Infrastructure failure

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Regulatory changes

- OSFI guideline for capital requirements:
  - Segregated funds capital
  - Holdco & Solo capital standards

- Capital Requirement by Bermuda Monetary Authority

- Solvency II: New regulatory solvency standards for insurance industry

- The Financial Services and the Treasury Bureau (FSTB) proposed establishment of an Independent Insurance Authority (IIA).
  Proposed revision to Privacy Ordinance.
  Tight control on requirements re Investment Linked Assurance schemes (ILAS).

- ERM guideline
- VA guideline

- The National Association of Insurance Commissioners: Solvency Initiatives
- Dodd-Frank regulations for financial services
- FATCA

- Indian Regulatory changes impacting the Unit Linked Insurance Products (ULIP) Structure, Charges and Distribution channels

- OSFI guideline for capital requirements:
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- India
- China
- Europe

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Global Regulatory Changes leading higher capital requirement:
- International Financial Reporting Standards
- Anti Money Laundering / Anti Terrorist Financing Act
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Risk management is all about execution

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<thead>
<tr>
<th>Strategy</th>
<th>Value</th>
<th>Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assess existing threats to realization of business strategy</td>
<td>• Understand risk drivers to financial results and plan, supporting management decision on risk-adjusted returns</td>
<td>• Optimize capital management and allocations</td>
</tr>
<tr>
<td>• Identify emerging hurdles to longer term goals and business targets</td>
<td>• Ownership of risks concept and improved accountability</td>
<td>• Capital intensiveness and volatility</td>
</tr>
<tr>
<td>• Defined appetite for tolerance levels in various exposures</td>
<td>• Prepare for emerging risks before it hits as a surprise</td>
<td>• Increasing risk-based focus of regulatory initiatives</td>
</tr>
<tr>
<td>• Make go / no-go decisions ahead</td>
<td>• Enhanced efficiency of overall enterprise operations</td>
<td>• Rating agency expectation on ERM</td>
</tr>
</tbody>
</table>

Risk management is all about execution.
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The next step: Going from Good to Great...

“It is not a task, it is a journey....A well-conceived strategy is important, but I could give our strategic plan to our competitors and not worry about it – because it’s all about execution.”

Richard M. Kovacevich, Chairman, Wells Fargo Bank

“Be skeptical of history-based models. Constructed... using esoteric terms ... these models tend to look impressive...” “Risk comes from not knowing what you’re doing.”

Warren Buffett, CEO, Berkshire Hathaway
Thank you

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