GI Asia International Working Party
One Year On

IFoA GI Asia International Working Party
Sie LAU & Nam Nguyen

18 October 2017

Agenda

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Who we are

⬦ GI Asia International Working Party created in Q2 2016

⬦ The first in Asia for the Institute & Faculty of Actuaries UK

⬦ We have members from Singapore, the UK, Hong Kong, India, China and Malaysia

⬦ We are from across the broad background from brokers, reinsurers, insurers, and working in various functions

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Working Party Vision

The vision for the framing of the objectives of the working party is captured by the following mission statement:

"The goal is to be the first regional working party formed outside UK of the IFoA, reaching out to support GI actuaries in the APAC region, to deliberate issues in the region specifically and in turn to support career growth for members in the region more specifically as well as to promote and raise awareness of the profession in the region as a whole, paving way for more such forum for the regions outside UK, and for other actuarial disciplines."

What is the intention of the working party

➡ To facilitate a market wide research on risks specific for the APAC region

➡ To develop relationships with regulators and local actuarial bodies

➡ To develop initially an understanding of the GI insurance and actuarial issues / hot topics

➡ To identify the perceived relative importance of these issues / hot topics for GI actuaries

➡ To focus on specific topics of interest, common to multiple markets, and to provide fresh light and new understanding

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The Risk Landscape: Aon Global Risk Survey 2017

1 Damage to reputation/brand	**2** Economic slowdown/slow recovery	**3** Increasing competition	**4** Regulatory/ legislative changes	**5** Cyber crime/ hacking/viruses/ malicious codes	**6** Failure to innovate/meet customer needs	**7** Failure to attract or retain top talent	**8** Business interruption
9 Political risk/ uncertainties	**10** Third party liability	**11** Commodity price risk	**12** Cash flow/ liquidity risk	**13** Property damage	**14** Directors & Officers personal liability	**15** Major project failure	**16** Exchange rate fluctuation
17 Corporate social responsib... sustainab...							**24** Weather/natural disasters
25 Failure t... or com... strategy							**32** Crime/theft/fraud/ employee dishonesty
33 Lack of t... infrastru... support ... needs							**40** Globalization/ emerging markets
41 Unethic...							**48** Absenteeism
49 Social m...							

CREDIT: TARO KARIBE/GETTY

www.aon.com/2017GlobalRisk

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But what about here?

Thailand flood

Japan Earthquake and Tsunami


New Zealand Earthquake
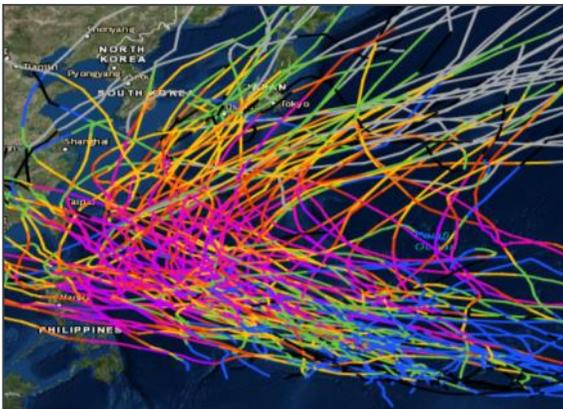
Typhoon

Volcanic Risk

Source: Deltares

Jakarta Flood

- Seven of the top ten Mega Cities will be in Asia by 2025

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Asia Economic and Insured Losses from Catastrophes

- In 2016 just over 10% of catastrophe losses in Asia were insured (US 51%, Europe 30%)

- Minimal <u>insured</u> experience to help develop and validate models

Asia Economic & Insured Losses

Legend: ■ Economic Loss (Inflated) ■ Insured Loss (Inflated)

Y-axis: USD Bn (0 to 350)

Source: Aon Benfield

Year	Economic Loss	Insured Loss
2000	31	2
2001	13	0
2002	24	1
2003	25	1
2004	93	14
2005	34	2
2006	38	2
2007	32	3
2008	145	2
2009	28	1
2010	95	2
2011	316	57
2012	41	1
2013	97	6
2014	75	10
2015	62	4
2016	111	9
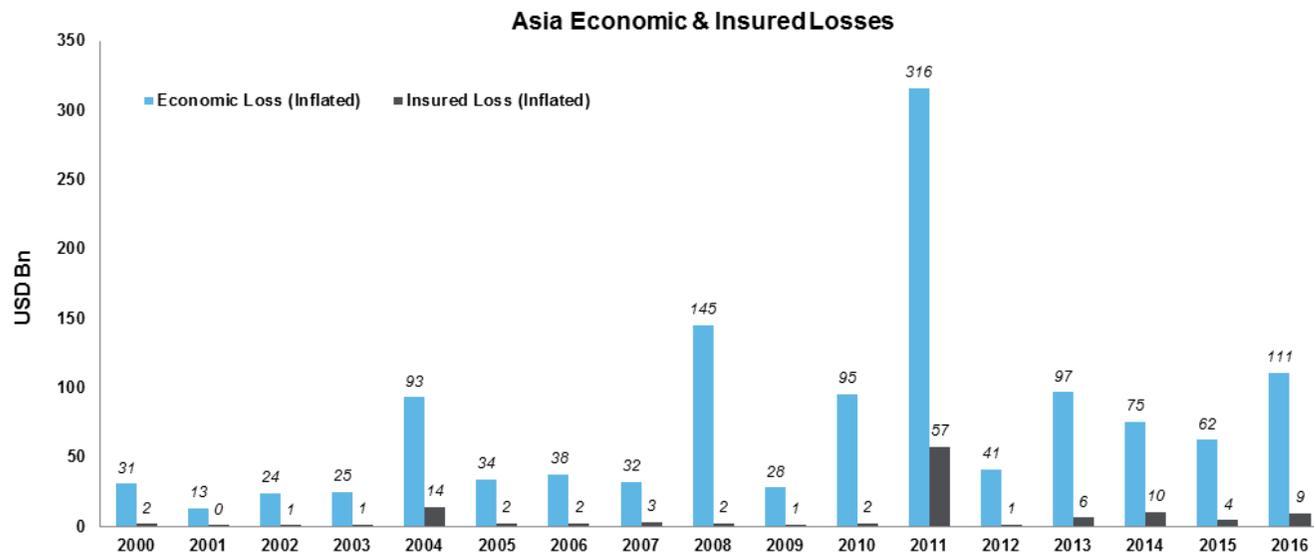
Insured to Economic Loss %	
US	53%
Europe	33%
APAC	12%
AU/NZ	40%
Japan	40%
Asia (exJPN)	6%

- Understanding nat-cat more widely and accurately may help us design products to allow more prefunding for nat-cat loss in Asia (via insurance pools, fund, bonds etc.)

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Reasons for Underinsurance

- Perception of risk and lack of knowledge of insurance

- Lack of trust in insurers

- Reliance on government post-disaster relief

- Limited access and ease of doing business

- Lack of experience and expertise in modelling, impacting availability and affordability of coverage

- As economies grow, some of these factors (e.g. affordability) will become less important

- As markets open up, new entrants will bring expertise (e.g. reinsurance sector in India)

UNDERINSURANCE MAP
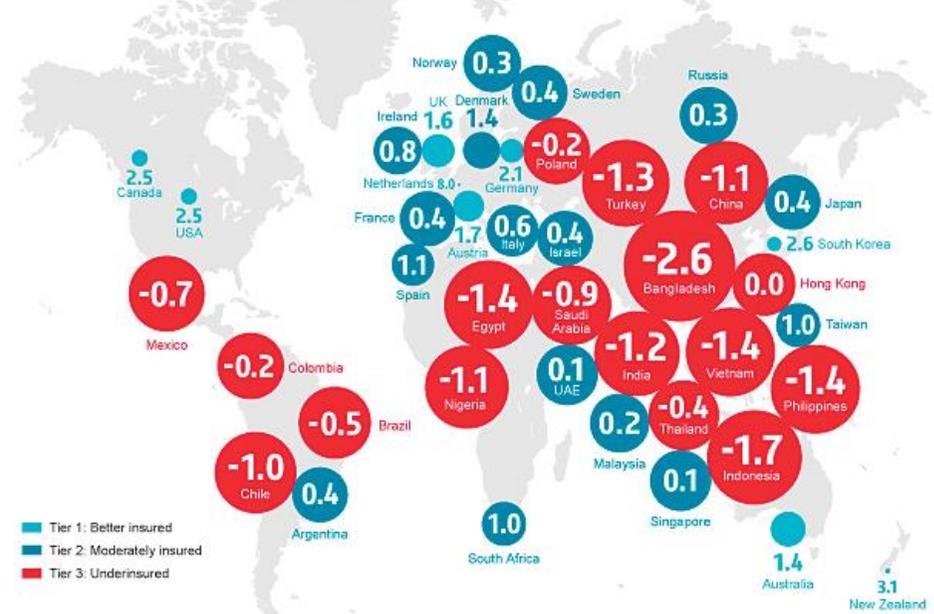
Challenges in Catastrophe Risk Assessment in Asia

Nature of typical insured portfolio – law of large numbers

- In some cases, smaller portfolios of high valued risks – higher potential volatility

Low insurance penetration, specialist portfolios

- Access to and lack of loss experience
- Typhoon Haiyan is a typical example

Access to development data

- Difficult to access required data - thus reliance on lower resolution or regional data

Historically US centric development with catastrophe modelling

- Recently changing with recognition of local needs

Modelled perils can give rise to large losses

- Surge, fire following, tsunami etc.
- Exasperated by all points above

Aftermath of Hurricane Andrew 1992 – note the flattened residential neighbourhoods

© 2010 FEMA
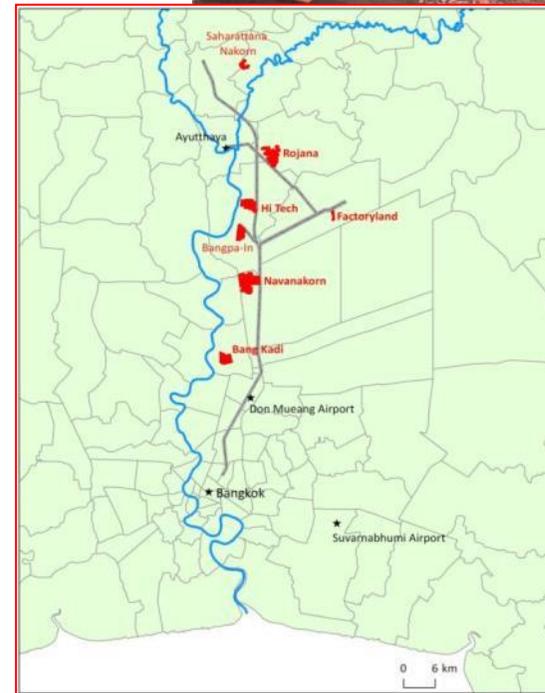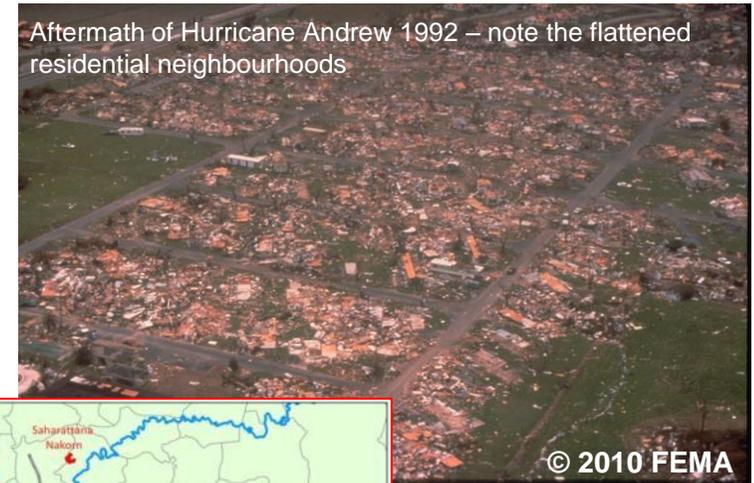
Red areas: industrial estates

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Implication of these challenges: Indonesia 1:250 modelled loss vs. single risk
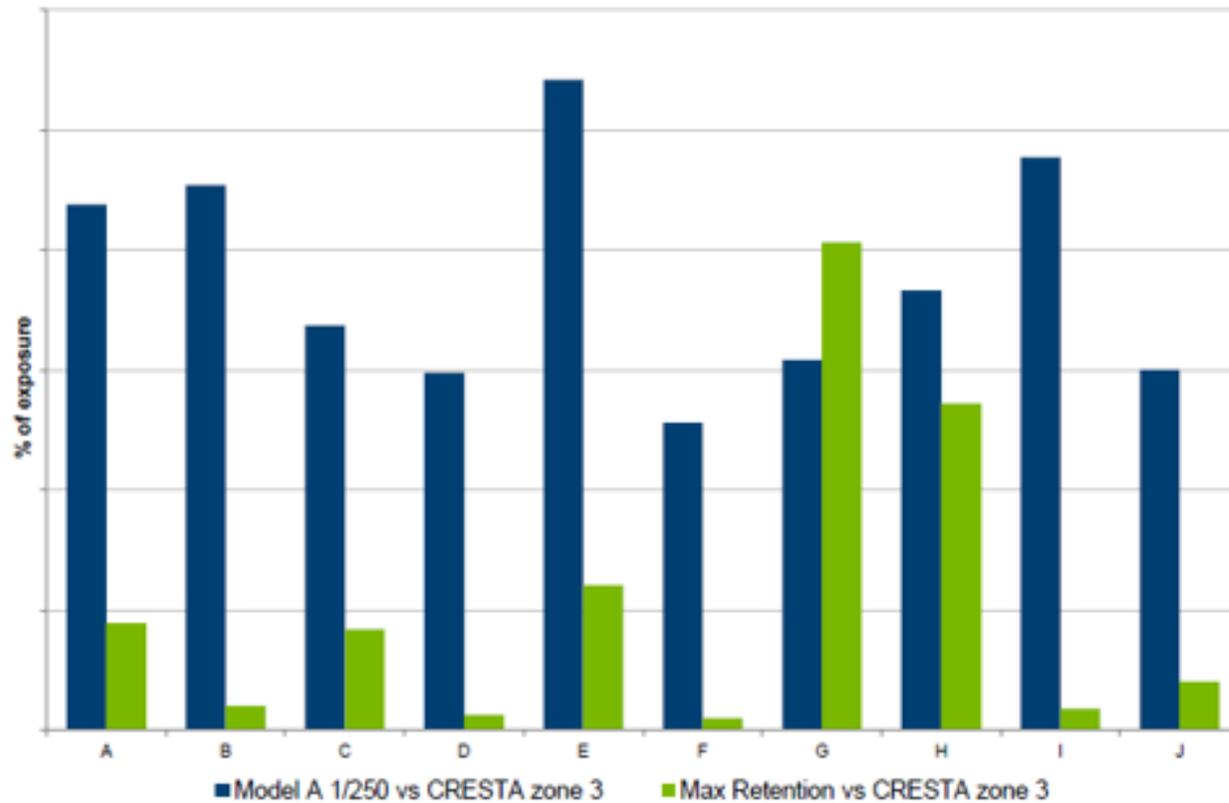
Aon Benfield

Regulatory Approach to Catastrophe Risk - Asia

- Regulatory focus on catastrophe risk has increased significantly in recent times

- Regulation requirements vary by country with prescriptive oversight common, especially in emerging countries (e.g. Indonesia, Philippines etc.)

- Several jurisdictions have moved or are in the process of moving to risk-based capital (RBC) requirements but is still considered relatively simplistic

- Catastrophe related RBC requirements in the region:

  - Factor based approach – e.g. China under C-ROSS

  - Scenario based approach – e.g. Australia regarding Insurance Concentration Risk Charge

  - To be decided – e.g. Singapore (catastrophe risk charge to be implemented after the rest of the RBC2) & Hong Kong (catastrophe risk charge has yet to be included in the proposed RBC system)

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Example of Factor Based Approach – China C-ROSS

- China's second-generation solvency regime, China Risk-Oriented Solvency System (C-ROSS) has come into effect since 1st January 2016.

  - The old supervisory regime did not take into account catastrophe risk of non-life insurance business, which was regarded as one of drawbacks of the old regime.

$$MC_{Non-life} = \sqrt{MC_{Non-Cat}^2 + 2 \times \rho \times MC_{Non-Cat} * MC_{Cat} + MC_{Cat}^2}$$

- Regarding non-life insurance risk, C-ROSS computes non-cat risk capital and cat risk capital respectively and uses them to compute the whole non-life insurance risk capital with a coefficient of correlation.

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Example of Factor Based Approach – China C-ROSS

- Currently C-ROSS takes into consideration four sorts of catastrophe risks.

  - Typhoon Property

  - Earthquake Property

  - Agricultural Insurance

  - Motor Insurance

$$\text{MC}_{\text{Cat}} = \sqrt{\sum_i \text{MC}^2_{Cat_i} + \sum_{i,j(i>j)} 2 \times \rho_{i,j} \times MC_{Cat_i} \times MC_{Cat_j}}$$

- C-ROSS computes the four sorts of cat risk capital respectively and uses them to compute the whole non-life cat risk capital with a matrix of correlation.

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Example of Scenario Based Approach: AUS APRA

- Regulatory focus on catastrophe risk has increased significantly in recent times.
  - ownership and understanding of cat risk management resides with the insurer
  - non modelled perils and components
  - methodology, data and assumptions
  - sensitivity of results

- *These points lead to more intensive scrutinisation that may require catastrophe modelling to be augmented with additional data or assumptions to address any concerns or non modelled elements*

- APRA are not unique in these concerns, with Solvency II and other regulatory regimes taking a similar stance including rating agencies.

- Asia looking to others for best practice

GPS 116: Catastrophe models

55 It is common practice for an insurer to use computer-based modelling techniques, developed either in-house or by external providers, to estimate likely losses under different catastrophe scenarios. If an insurer uses such a model, the model must be conceptually sound and capable of consistently producing realistic calculations.

An insurer must be able to demonstrate:

(a) that the model has been **researched** and **tested**;

(b) that the insurer has taken measures to ensure that the data used to estimate its losses is sufficiently consistent, accurate and complete, and there is appropriate documentation of any estimates of data used; and

(c) **an understanding of the model used** in estimating losses, including;

  (i) perils and elements that are not included in the model;

  (ii) assumptions and any estimates used in the modelling process; and

  (iii) the **sensitivity of the model outputs** as a result of the factors in (i) and (ii).

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Catastrophe Model Landscape for Asia

- In the past two years, the modelling landscape in Asia has seen an increase in sophistication and scope – thus increased focus on data quality

- External pressure from events and regulatory bodies has also put higher focus on data

- Continual investment in Asia from Catastrophe Model Vendors in recent times. All model vendors now have local offices in Asia. Many of the secondary perils (precipitation, flooding, storm surge, tsunami) are now addressed.

- While many perils previously unmodelled are now covered by vendor models, adoption of these tools varies significantly by country:
  - Multinational with head/regional office support are likely in general to adopt catastrophe models as part of BAU
  - Similarly for large local firms in developed markets (e.g. Japan, Singapore, South Korea etc.)
  - Other firms, especially in emerging markets, have varying degree of adoption ranging from firms with little understanding of catastrophe modelling to firms that use outputs from external parties (e.g. reinsurance brokers)

Catastrophe Model Availability, number of models available from global providers

Country	Perils Covered		
	EQ	WS	FL
Australia	3	3	
China	3	3	1
Hong Kong	3	3	
India	3	2	
Indonesia	3		1
Japan	4	4	
New Zealand	3	1	
Philippines	4	3	
Singapore	4		
South Korea	1	4	
Taiwan	3	4	
Thailand	4	2	1
Vietnam	3	2	1
Macau	3	3	
Malaysia	3	2	1
Pakistan	2	1	
Guam	1	3	

Indicates where there is a new or revised model for 2016/17

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Role of Government in Catastrophe Risk Management - Asia

- Various pools in existence (Taiwan EQ pool, New Zealand EQ fund etc.)

- Case study of India:

  - Terrorism pool created in 2002 (Mumbai attack in 2008 wiped out 1/3 of pool)

  - Subsidised crop insurance cover introduced in 2016, expecting to cover 50% of farmers in two years from now

  - Subsidised property insurance for Below Poverty Line has also been proposed

- Aside from the pools/subsidies above, alternative cat risk solutions are also available within the region, albeit not common

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Alternative Risk Transfer Case Study - China

- On 1st July 2015, China's first catastrophe bond was issued by China Re on the international capital market, through Panda Re, a Bermuda-based special purpose vehicle.

  - The face amount of the cat bond is USD 50 million.

  - The cat bond covers risks incurred from earthquakes in China. A portion of the earthquake insurance underwritten by China Re and its subsidiary was ceded to Panda Re, which then sought financing for the coverage on the bond market.

  - Subsidised property insurance for Below Poverty Line has also been proposed

- There are several types of triggers for Cat bonds:

  - Indemnity Trigger

  - Modelled Loss Trigger

  - Index Trigger

  - Parametric Trigger

- The first cat bond in China is based on indemnity trigger and the principal is at risk

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Alternative Risk Transfer Case Study - Philippines

- August 2017, after several years of discussion with the World Bank, the Philippines has launched a parametric natural catastrophe insurance programme (typhoon and earthquake) backed by a catastrophe swap.

  - Insureds are the provincial governments units, with parametric payouts based on modelled losses, intended to provide quick payouts to facilitate disaster response.

  - This is backed by a catastrophe swap with international reinsurers include Nephila, Swiss Re, etc. providing up to US$206 million of coverage

- The initial pilot covers 25 of 81 provinces for 1 year, with the intent to expand nationwide eventually.

- This is part of a multitier approach to disaster financing being developed in the Philippines (including a long-planned householders cat pool and national level contingent loans / planned cat bonds).

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Further Related Areas of Interests for Local Practitioners

- Following a presentation by the GI Asia International Working Party earlier this year in Singapore, we have received various queries and feedback. This has demonstrated significant interests from local practitioners with regard to catastrophe modelling.

- One main theme is the credibility of catastrophe model results, in light of various updates/changes made to many regional models over the past year. Model users are unsure how often a catastrophe model would give an accurate tail event and how they can trust model outputs given that results change every year.

- Another theme that was raised is the prospect of Big Data and Machine Learning to aid natural catastrophe modelling, in view of lack of economic losses in the region.

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What are the Next Steps for Working Party

- We want to hear from local practitioners

  – Local, Regional Challenges

  – Key issues within local markets

  – Data challenges

  – Our immediate focus is on Nat-Cat Risk

- How will the working party aim to engage

  • Survey

  • One-on-one

  • Continuous Feedback

  • Industry events

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Who we are

Members

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THANK YOU