Insurance in Integrated Flood Risk Management

A perspective based on the 2011 Thailand flooding

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Content

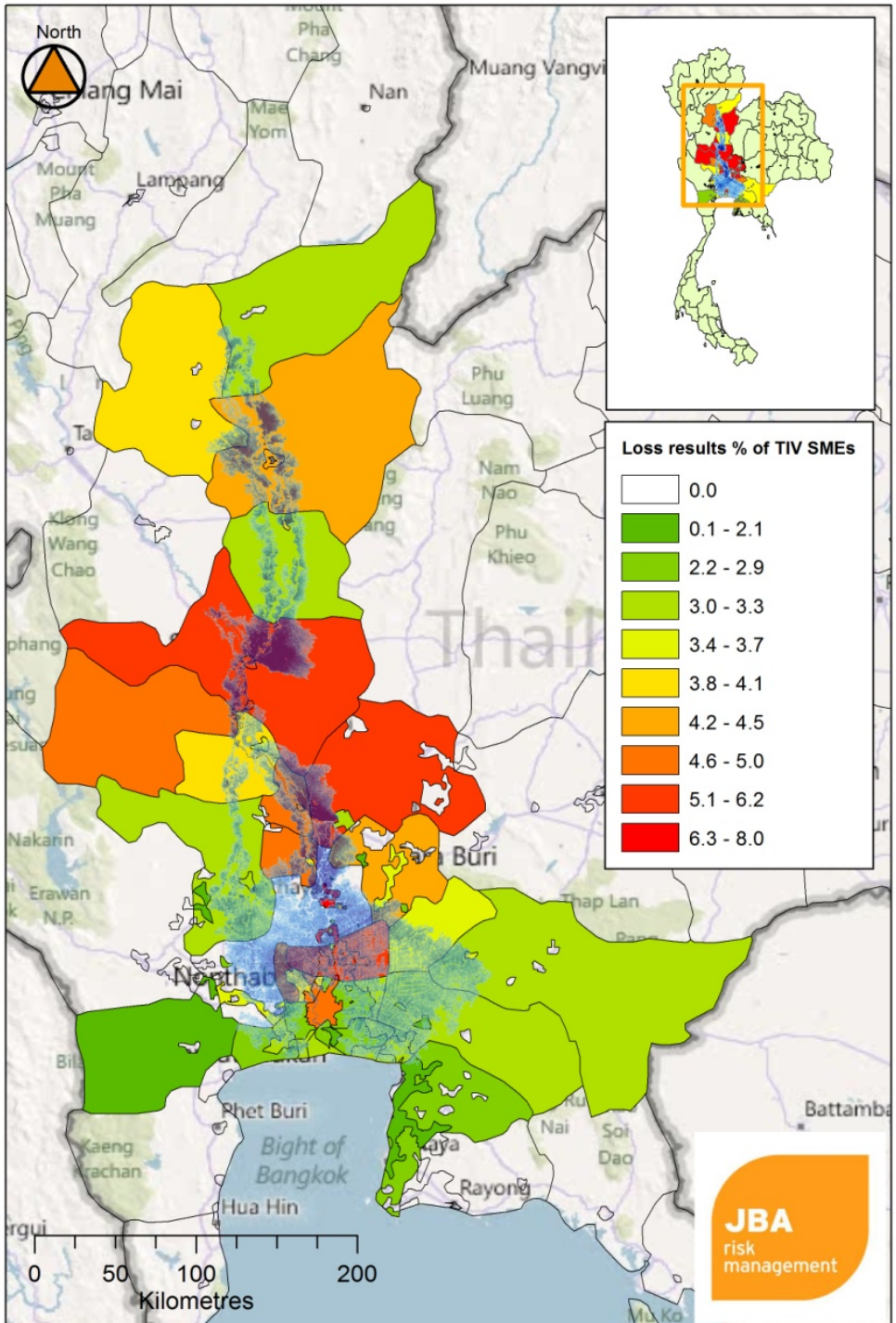
- A retrospective of the Thailand flooding from an insurance perspective
  - A few eggs in 1 basket: Very large losses at few industrial sites
  - Underinsurance: link between the insurance gap and the burden on the tax payer following flood events
  - Spreading the loss: Who paid the insured losses and what impact did the event have on the insurance market?
  - Understanding the risk: Cat models are essential to help insurers gain the knowledge and confidence to provide insurance
  - Have adequate flood risk management measures been undertaken since the event?

- Flooding in Thailand in 2011 cost the insurance industry $12-15bn
- At the time of its occurrence, this was the 9th costliest insurance event since 1980
- The insurance industry was unprepared for a loss of this size, from flood, in Thailand

The event

Chao Phraya catchment filled with water following prolonged heavy rain

Losses seen throughout the catchment



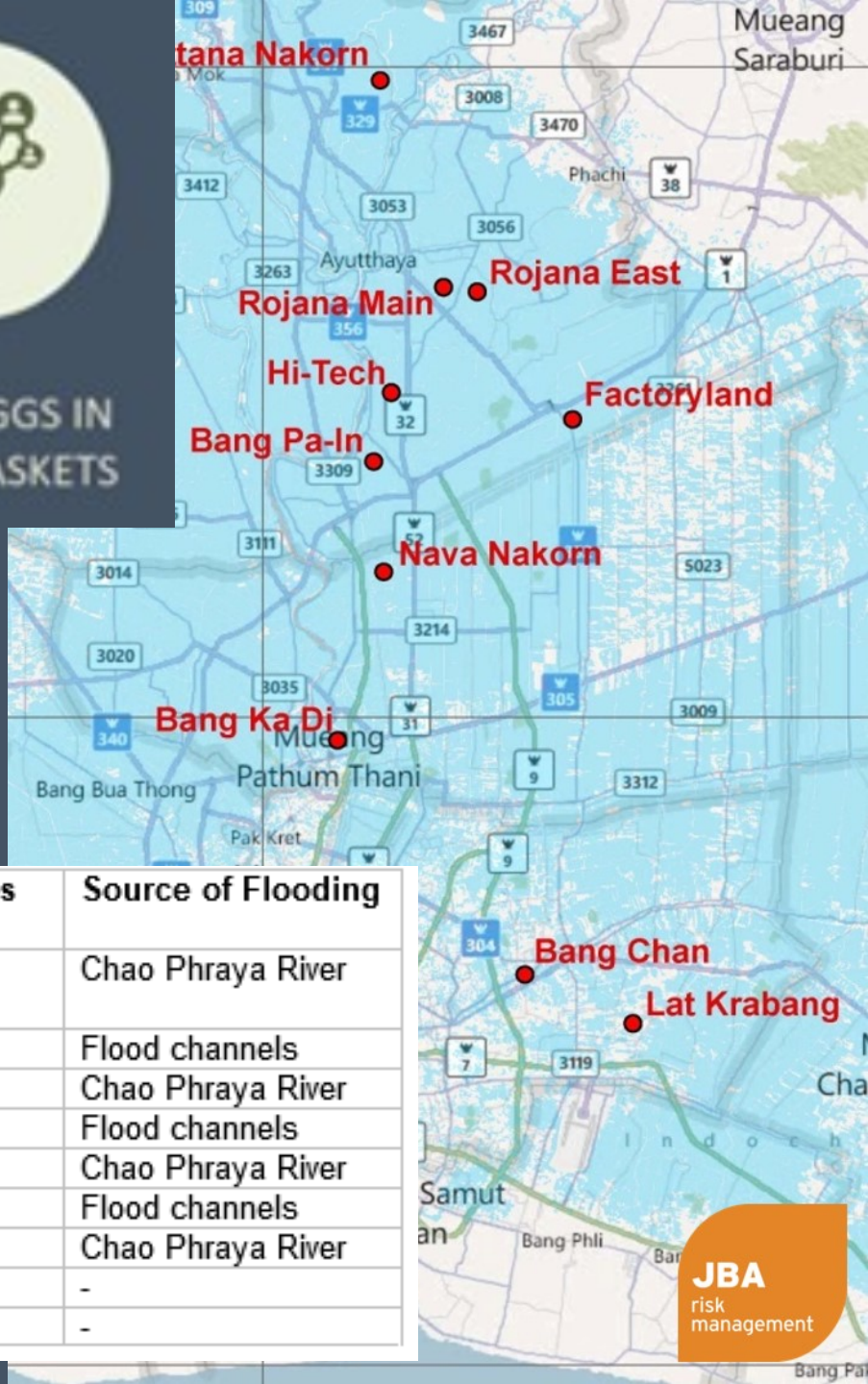
Impact

Economic damage / loss	USD 45.7bn
Deaths (9*)	815
Impacted households (1*)	1,886,000
Displaced people (1*)	2.5 million
Manufacturing sector loss (8*)/(1*)	USD 32bn (71% of real GDP)
Reduction in real GDP growth rate (1*)	4.1% to 2.9%

Flooding at industrial sites (3*)

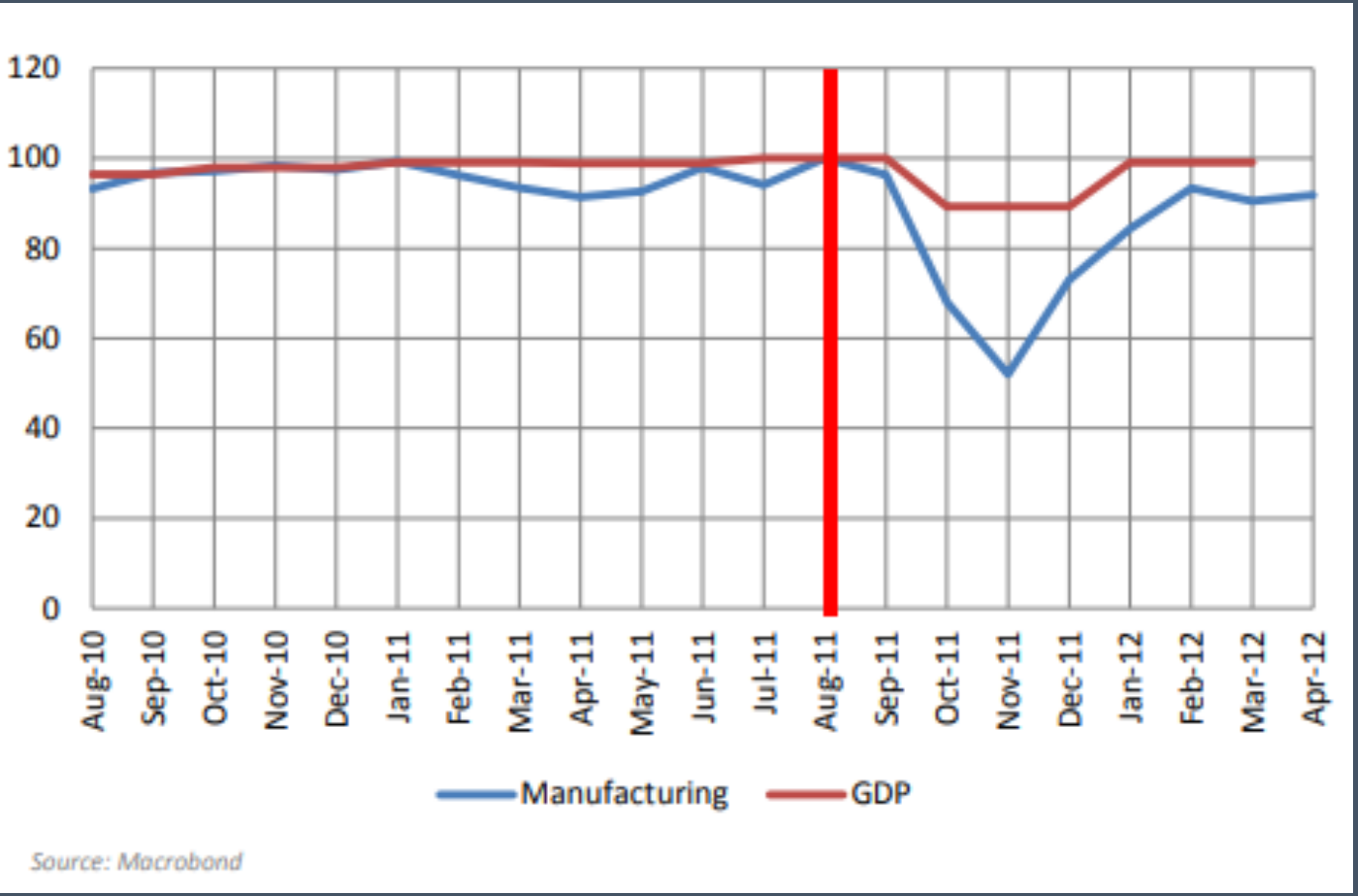
MANY EGGS IN MANY BASKETS

Exacerbated by shift of production from Japan to Thailand following Japan earthquake and tsunami



Hotspot	Flooding reaches property	Flooding recedes from property	Source of Flooding
Saha Rattana Nakorn	4 October	4 December	Chao Phraya River
Rojana	9 October	1 December	Flood channels
Hi-Tech	13 October	26 November	Chao Phraya River
Factoryland	15 October	15 November	Flood channels
Bang Pa-in	16 October	21 November	Chao Phraya River
Nava Nakorn	17 October	29 November	Flood channels
Bang Ka Di	20 October	26 November	Chao Phraya River
Bang Chan	Did not flood	-	-
Lat Krabang	Did not flood	-	-

Thailand manufacturing index / GDP output (4*)



Industrial losses in Thailand: Insurance takeaways

Potential for losses globally following flooding at only 7 industrial sites

Losses due to business interruption, contingent business interruption and supply chain disruption are extremely hard to predict

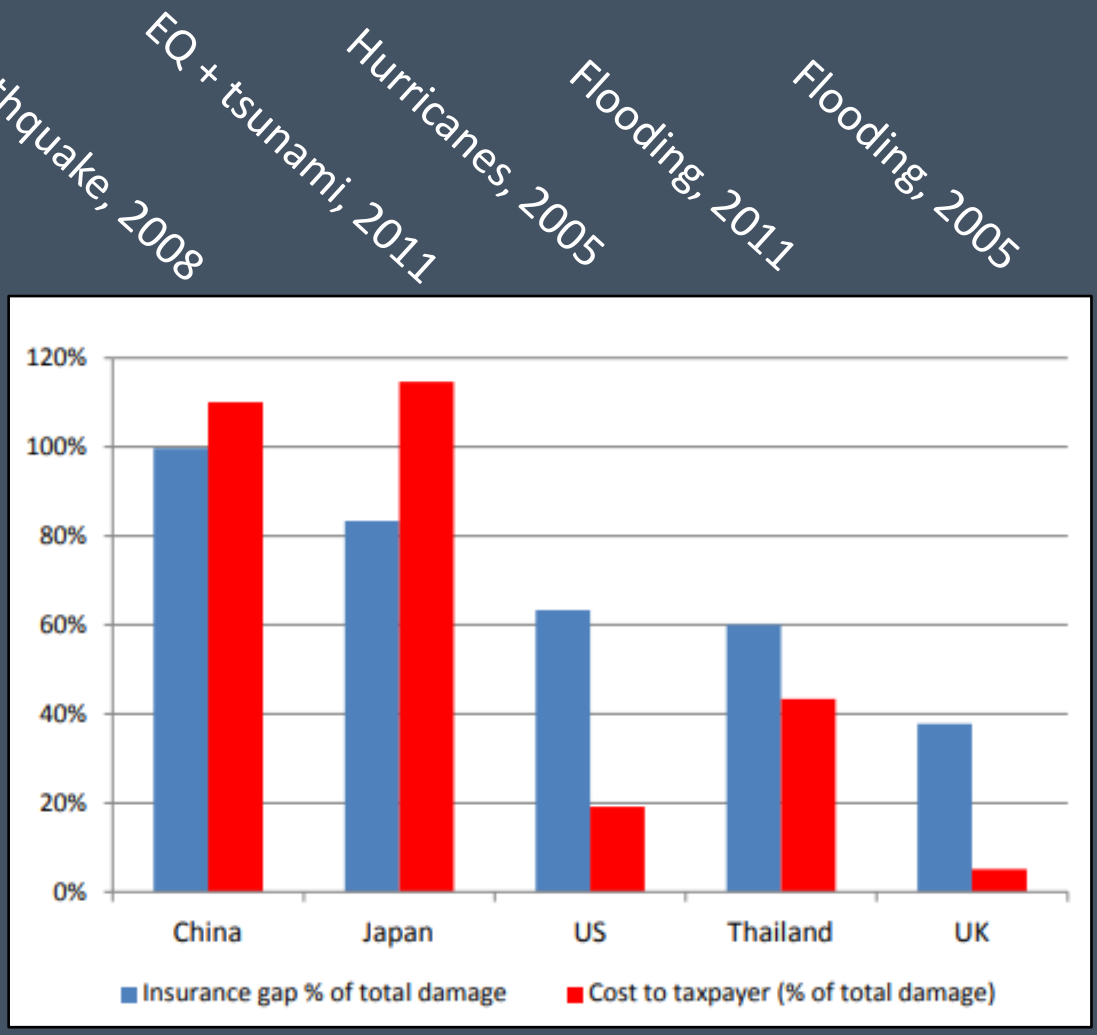
Potentially unknown levels of exposure at such sites

High quality flood modelling needed to predict what can physically happen at high-value industrial sites

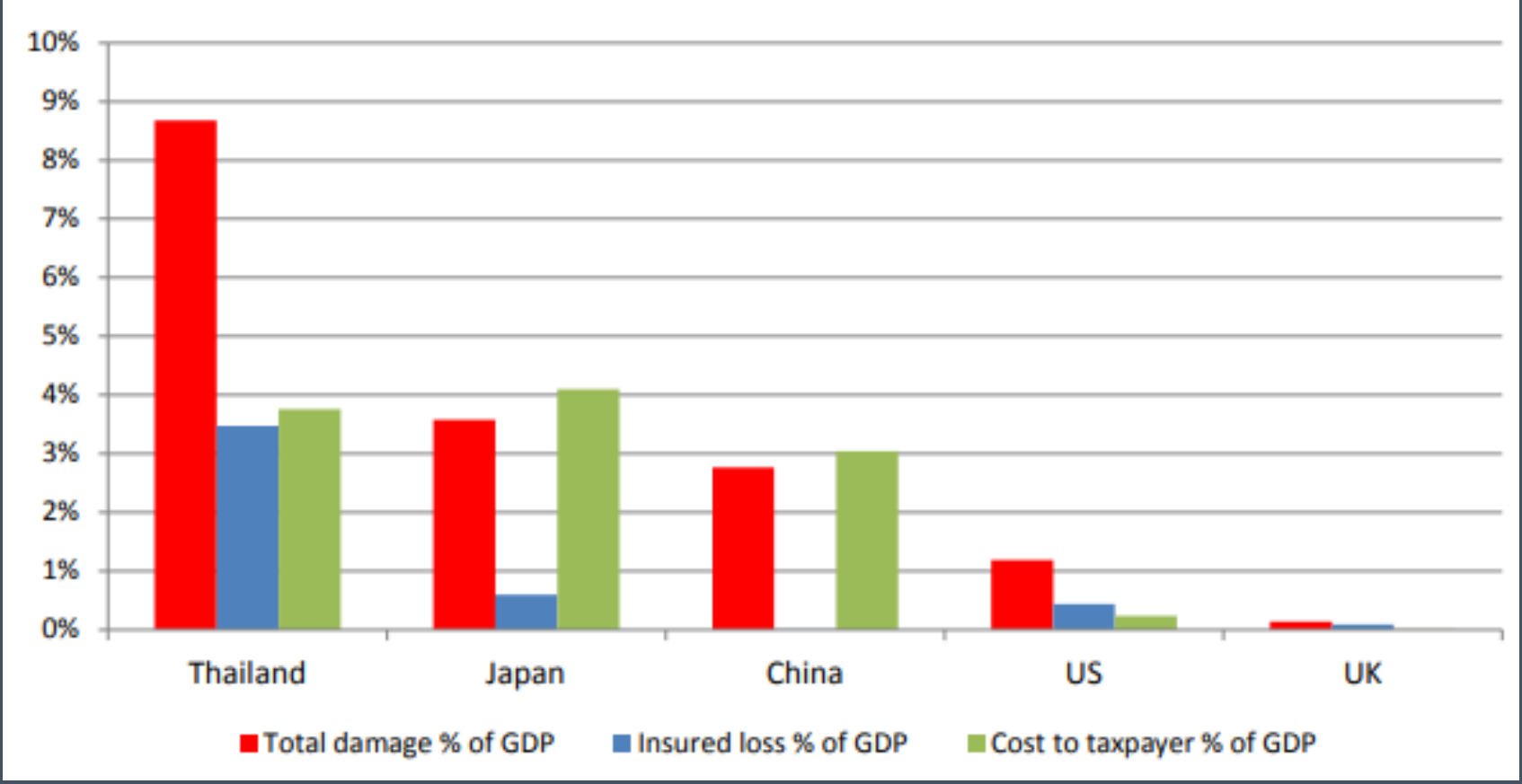
Insurance gap and cost to tax payer(4*)

Insurance gap = total damage – insured damage

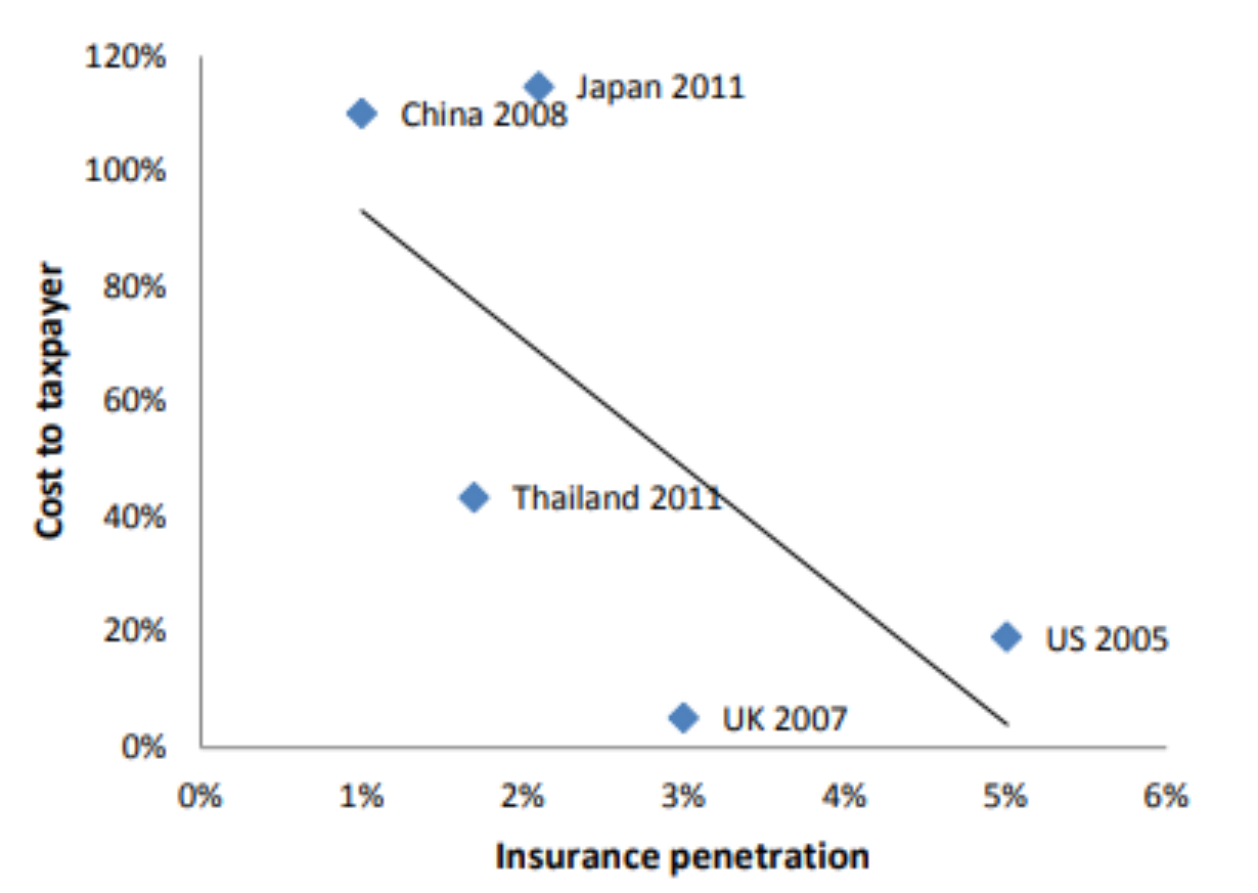
Burden on taxpayer decreases as uptake of insurance increases



Total damage, insurance gap and cost to tax payer, as a % of GDP(4*)



Insurance penetration vs cost to taxpayer (4*)



A 1% point increase in insurance penetration is associated with a reduced burden on the taxpayer of one fifth of estimated total damage

Marks and Thomalla, 2017:

*"**six of the 26 people interviewed had flood insurance**. In all but one of these cases, the insurance payout was less than half of their financial losses. Nonetheless, **this helped to reduce losses, and they were glad that they had bought insurance**."*

"Only 25% of the SME owners who did not have insurance prior to the 2011 flood have subsequently bought it. () 75% of SME owners did not buy insurance after the floods. () The two main reasons interviewees gave for not buying insurance were that: (1) they do not think it will flood as badly as it did in 2011; are (2) that next time they will move their merchandise before it floods so that the damage will not be as severe."

Since 2011, the government has only made minor efforts to reduce flood risk. These have focused on building floodwalls to reduce risk to large-scale enterprises, which have redistributed risk to unprotected areas

Who paid?

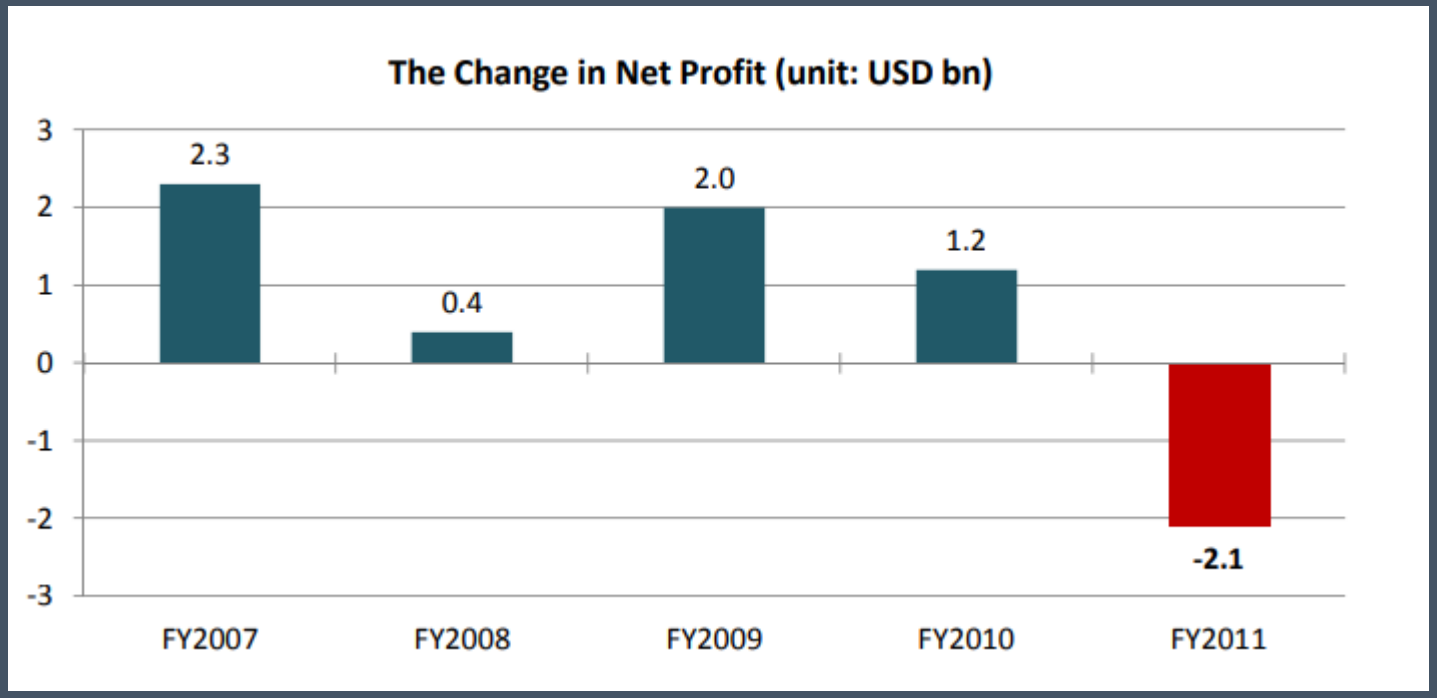
16 re/insurers:	$11,978m	89%
33 re/insurers:	$1,516m	11%
Japanese insurers:	$5,707m	42%

ACE, ACR, Allied World, Aterra Capital, Amlin, Arch, Argo, Ariel, Asian Re, Aspen, AXIS, Beazley, Best Re, Chubb, Endurance, Flagstone, Hardy, HCC Insurance Holdings, IAG, Labuan Re, Lancashire, Markel, Montpelier Re, MRB, Novae, Platinum, Ren Re, Taiping Re, Thai Re, Transatlantic, Travelers, Validus, White Mountains

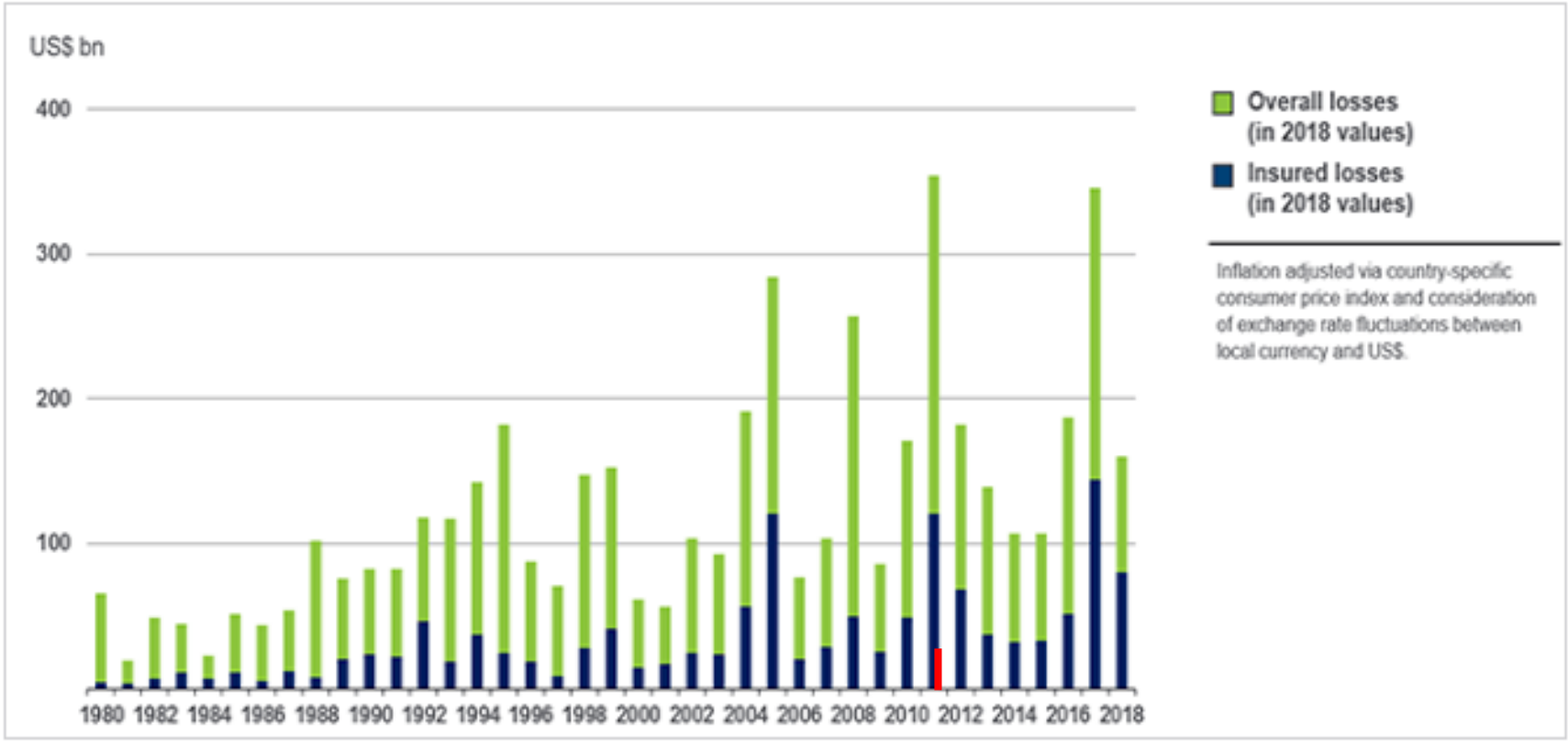
Company	Net Loss Est. /USDmn
MS&AD	3,000
Lloyd's	2,200
Tokio Marine	1,417
NKSJ	1,290
Toa Re	956
Munich Re	680
Swiss Re	680
QBE	261
Hannover	254
Everest Re	218
Fairfax	202
CCR	194
SCOR	186
XL Group	185
Korean Re	135
Partner Re	120

Financial impact on the insurance market (8*)

Financial impact on the 5 Japanese insurers most impacted by the event:



World natural catastrophes by overall and insured losses, 1980-2018 (6*)



Source: © 2019 Munich Re, Geo Risks Research, NatCatSERVICE. As of March 2019.

Spreading the risk

MANY EGGS IN MANY BASKETS

IT'S MORE THAN JUST FLOODING

Re/insurance ensures that:

- The burden on the government and tax payer after an event is significantly reduced
- The cost of risk is spread across many companies worldwide
- Each of those companies spreads its own risk across multiple perils and territories so that no one risk it bears can be catastrophic to the company
- The spread of risk goes beyond flooding

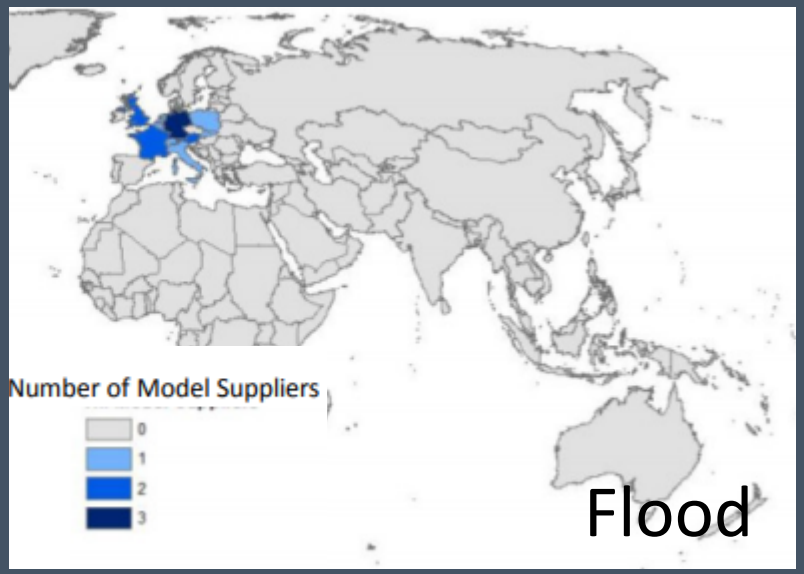
How did insurers respond to the event?

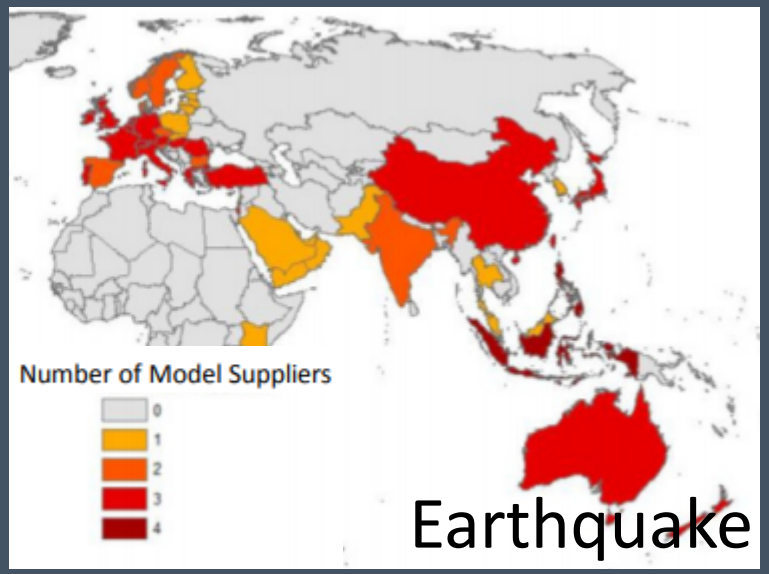
Insurers like risk but don’t like surprises!

Initial concern at what might happen again > insurance harder to acquire in Thailand + rise in reinsurance prices for Asia flood

Why was it a surprise?

Available cat model coverage at the time:





No cat model coverage for Thai flood at the time of the event

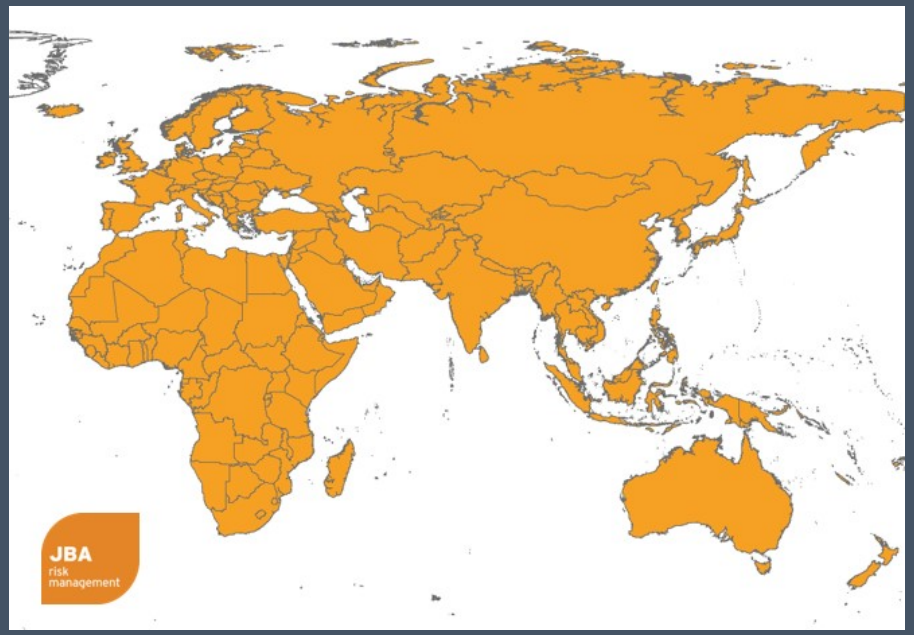
The importance of cat models

Insurers' knowledge of natural catastrophe risk comes from cat models

These enable insurers to work out what a risk can cost and encourages them to offer insurance

The Thailand floods drove the development of flood cat models worldwide – including in the DMCs

There is now a strong appetite to offer flood insurance in Asia



In conclusion…

Insurance can significantly reduce the burden of losses on governments and tax payers following a flood

There is appetite to offer flood insurance in Asia among many players

BUT there is a need to narrow the insurance gap if countries are to maximise the benefit of insurance

Flood cat models and flood risk management are key to enabling effective insurance

Questions or comments?
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Information

1* Haraguchi M, and Lall U, 2014. Flood risks and impacts: A case study of Thailand's floods in 2011 and research questions for.... International Journal of Disaster Risk Reduction (2014), http://dx.doi.org/10.1016/j.ijdrr.2014.09.005i

2* *Institute of Actuaries, Japan, quoted at https://www.casact.org/*

3* JBA Risk Management 2011/12. Internal field trip notes. Photo copyright: Ian Millinship and Helen Smith

4* Lloyd's Global Underinsurance Report, 2012. Lloyd's (2012), and citations therein. Available at: https://www.preventionweb.net/publications/view/29838

5* Munich Re. Topics geo natural catastrophes 2011, 2012. (cited in Haraguchi and Lall, 2014).

6* Munich Re, GeoRisks Research, NatCatSERVICE as of March 2019. Cited at https://www.iii.org/fact-statistic/facts-statistics-global-catastrophes#World%20Weather-Related%20Natural%20Catastrophes%20By%20Overall%20And%20Insured%20Losses,%201980-2018

7* The World Bank, Thai Flood 2011: Rapid assessment for reslient recovery and reconstruction planning. Washington DC, U.S; 2012.

8* World Bank, 2013. https://www.worldbank.org/en/news/feature/2011/12/13/world-bank-supports-thailands-post-floods-recovery-effort

9* https://en.wikipedia.org/wiki/2011_Thailand_floods

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