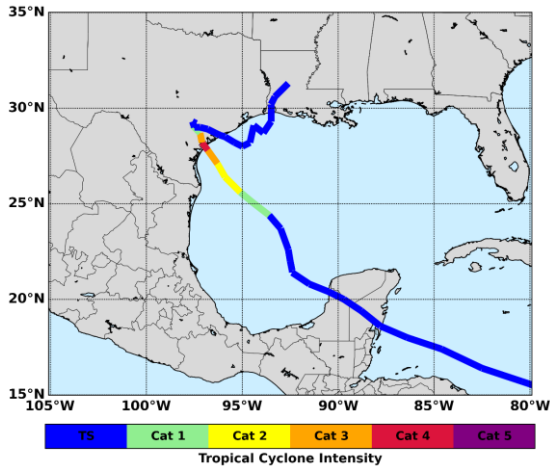




Closing the Protection Gap for Natural Catastrophe Risk

RenaissanceRe Holdings Ltd.
Kevin J. O'Donnell
November 29, 2017

Harvey



17th Aug

3rd Sept

30th Aug

16th Sept

3rd Oct

First Landfall (US)

Aug 25th 10:00PM; Rockport, Texas

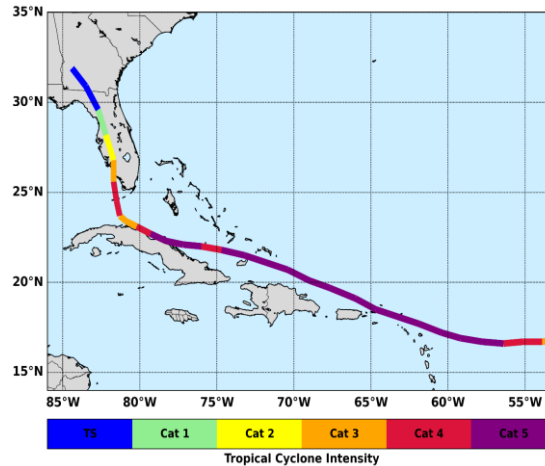
Homes affected, damaged or destroyed
225,000+

Businesses damaged or destroyed
4,100+

Key Themes:

Flood protection gap, NFIP, Auto portion of storm losses

Irma



First Landfall (US)

Sept 10th 9:10AM; Cudjoe Key

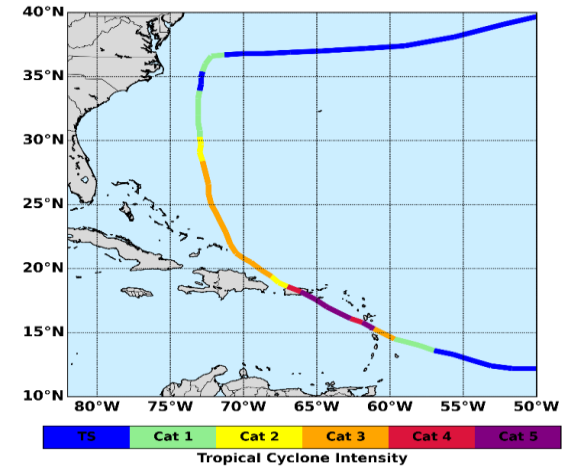
Max Wind speed
185 mph

Death toll
~88

Key Themes:

Test Florida market (AOB, FHC, etc.), Lack of loss adjusters, Caribb. losses, \$100B – what if Miami?

Maria



First Landfall (Puerto Rico)

Sept 20th 6:15AM; Yabucoa

Power outages
~95% left without electricity

Agricultural impact
~80% of crops destroyed

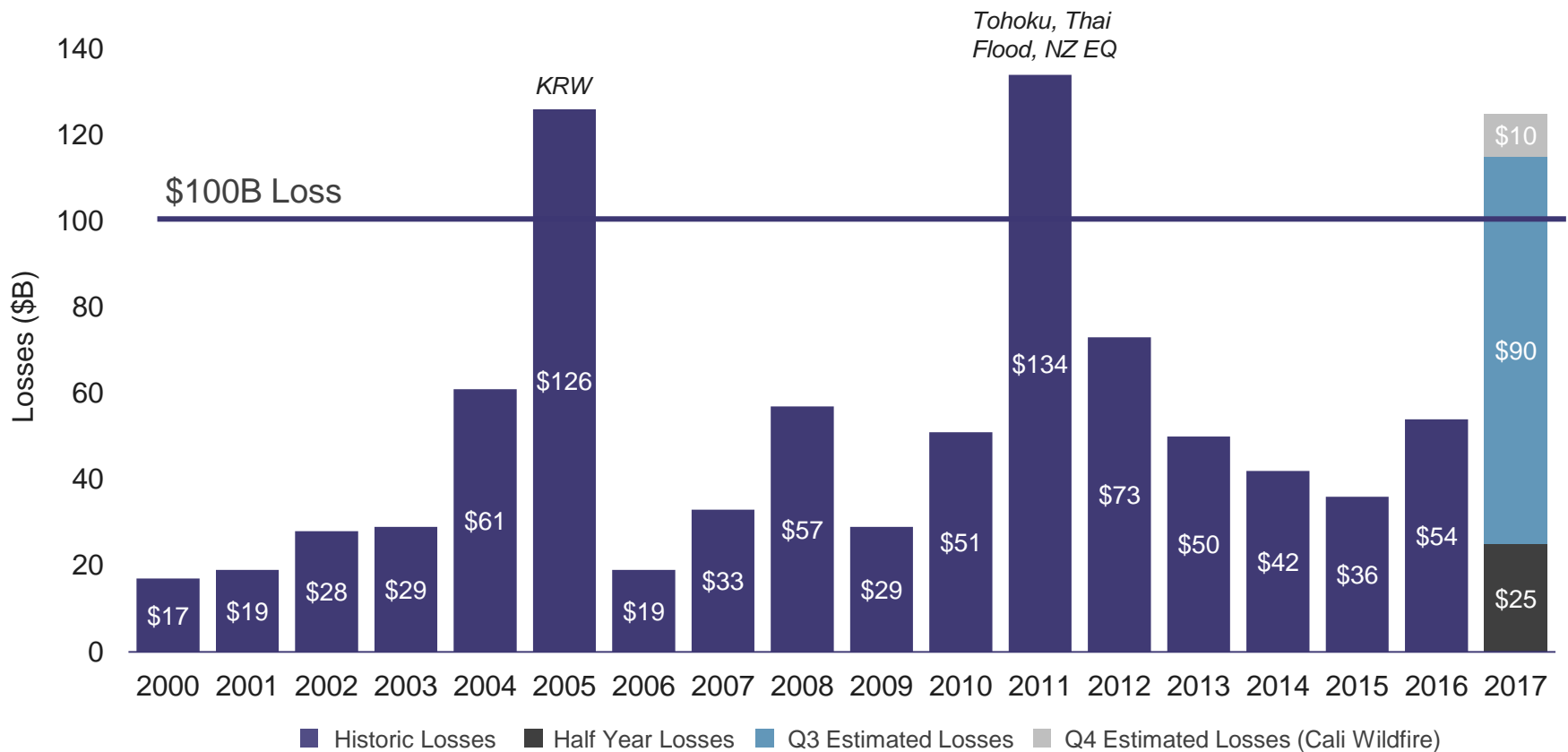
Key Themes:

Accuracy of Cat models, Code sufficiency, Business Interruption, demand surge

This year is on track to be one of the largest loss years ever...

“2017 will be the third year having more than \$100B of insured losses over the previous 15”

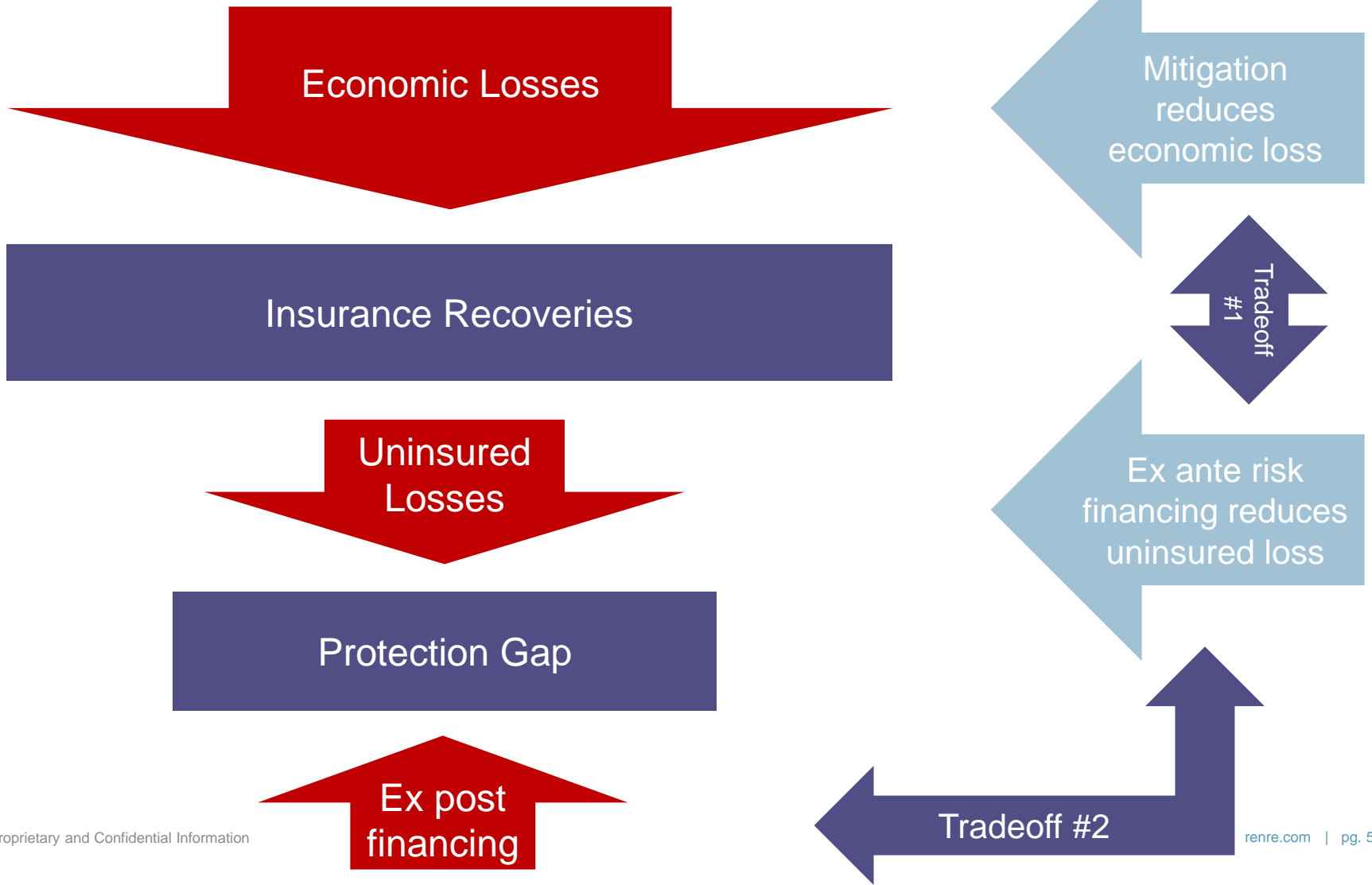
Historical Annual Insured Losses



Sources: VJ Dowling (IBNR), RNR Holdings Ltd Earnings Call Q3 2017, modelling agencies, PCS

- Natural catastrophes are unavoidable
- Impact of natural catastrophes include:
 - Economic loss
 - Can be quantified monetarily
 - Theoretically insurable
 - Social impact – loss of life, displaced families, etc.
 - Difficult to quantify monetarily
 - Insurance not a perfect substitute (e.g., post-disaster emigration)
- Knowing that there will be natural catastrophes, society makes tradeoffs between:
 - Investing in physical resilience (mitigation, land usage, building codes, etc.)
 - Ex ante risk financing (insurance, reinsurance, risk transfer, etc.)
 - Ex post risk financing (debt, govt. assistance, unintended self-insurance, charity, etc.)

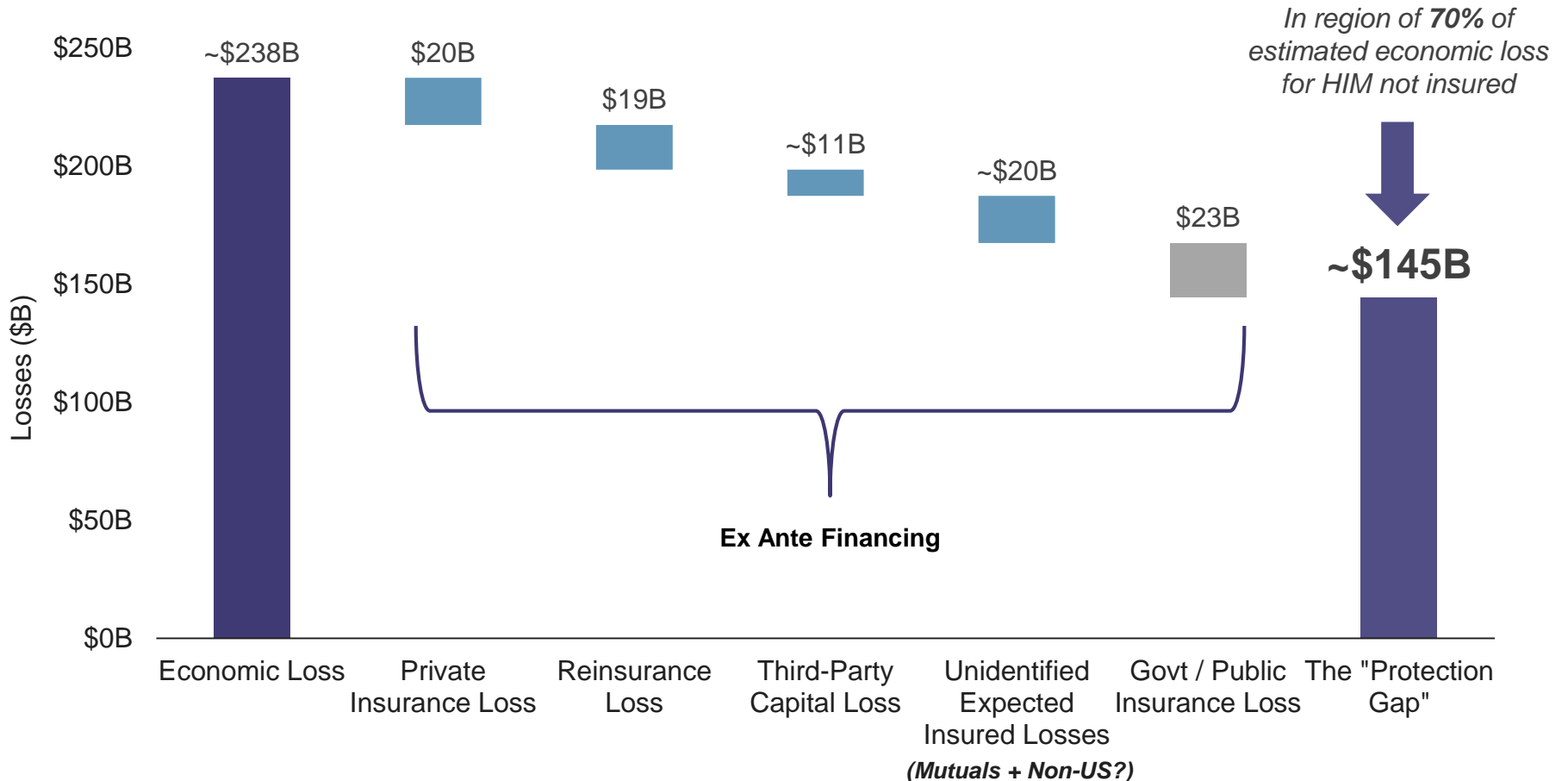
Natural Catastrophes



Significant protection gap

Harvey, Irma and Maria highlight the extent of the insurance “Protection Gap”; the industry is striving to close this gap by growing the insurable pool of risk...

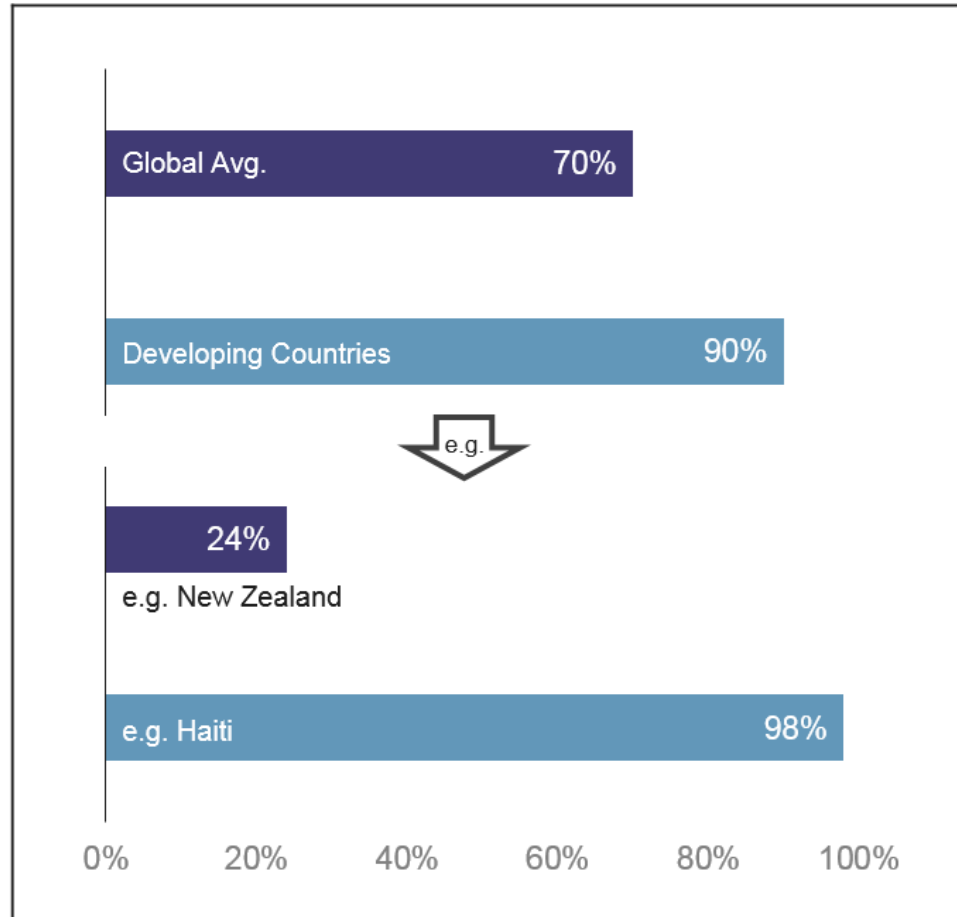
Estimate of 3Q Cat Losses & Source of Claims Payment



Sources: Moody's, AIR, RMS, PCS, FEMA, FHCF, Artemis, Q3 Financials, etc.

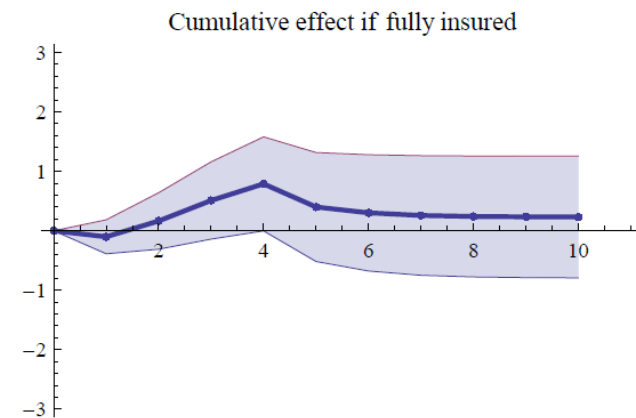
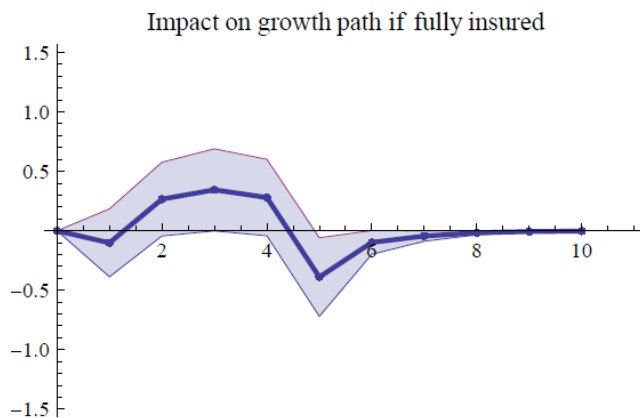
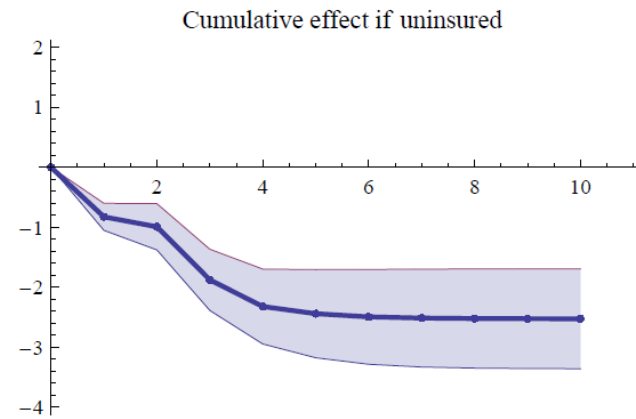
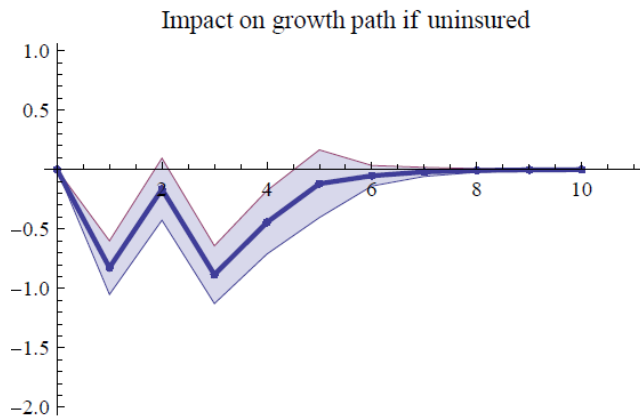
The protection gap is even greater in the developing world...

Uninsured Losses as % of Economic Losses ('07 - '16)



Source: Insurance Development Forum, Lloyd's

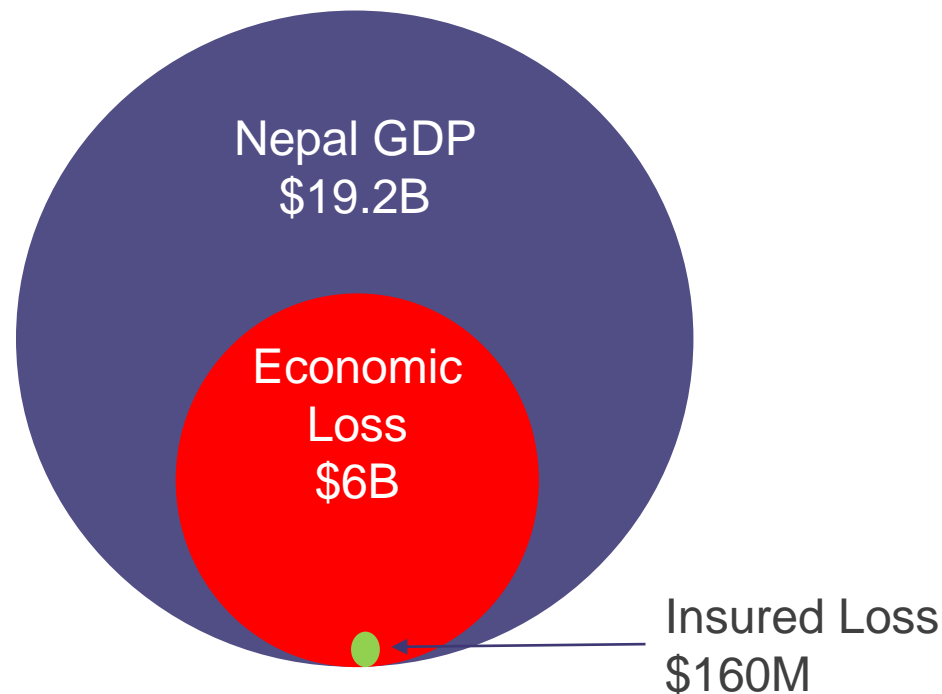
- Ex post financing results in significant decrease in GDP post-disaster
- Ex ante financing (insurance) results in permanent increase in GDP post-disaster



Source: BIS Working Paper No 394, *Unmitigated disasters?*

Example of Protection Gap - 2015 Nepal Earthquake

- Magnitude 7.8 earthquake
- Economic cost - \$6B
- Social impact - 9,000 fatalities, extreme displacement of families
- Insufficient mitigation and ex ante risk financing
 - Mitigation - Most of population live in unreinforced masonry buildings
 - Risk Transfer - P&C Insurance penetration .5% of GDP



Why is there a protection gap?

- Economic losses must be absorbed - Why chose ex post financing?

- Developing countries
 - Ex ante funding may not be economically feasible
 - Lack of awareness of risk
 - Underdeveloped insurance market/regulatory framework
 - Poor construction/weak building codes

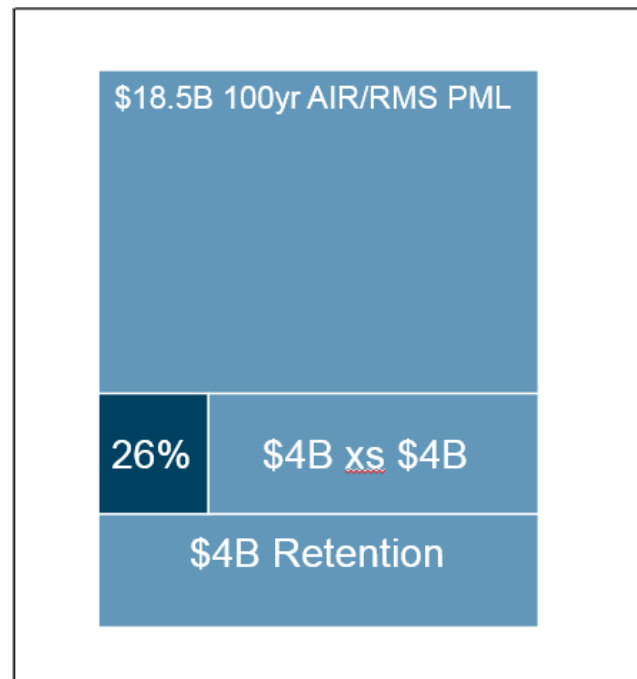
- Developed countries
 - Government crowding out – “Why should I buy insurance if the government will bail me out?”
 - Political incentives to defer recognition of costs – budgets are tight
 - Time inconsistency of preferences
 - Politicians will spend any insurance surplus on more pressing needs
 - Impossibility of governments to save for natural catastrophes

- Private reinsurance transforms ex post government insurance to ex ante financing
 - Makes government part of the solution
- Government transfers contractual duty to save to private insurer, which cannot ex post finance – shrinks protection gap
- Reduces many drawbacks of ex post financing
- Flood Re is a great example of how the public/private approach can work to close the protection gap



- NFIP historically dependent on ex post funding
 - Demonstrated by its \$30B+ of unfunded losses (*i.e.*, taxes)
- Purchasing private reinsurance is a step towards real ex ante financing and decreasing the protection gap
- Anticipate full limit loss on \$1 billion reinsurance purchase
- Strong private market appetite for flood

NFIP Reinsurance Purchase



Closing the protection gap - collaboration and alliances are key...



- Solutions to help developing economies tackle underinsurance and improve their resilience against the economic impact of natural catastrophes
- Emerging economies across Latin America, Africa, and Asia currently contribute 40% to global GDP, yet represent only 16% of global insurance premiums
- \$445 million of capacity from 8 syndicates



- Every society must make tradeoffs between mitigation, ex ante risk financing and ex post risk financing
- Many of these tradeoffs are difficult, and can result in a protection gap
 - Especially in developing countries
- In developed countries, the protection gap is often a function of political reality and inappropriate incentives
- Private risk transfer can help close the protection gap
 - Flood Re – example of effective public/private partnership
 - NFIP – strong private market demand for flood risk
 - Lloyds' DRF – helping to address the protection gap in emerging markets

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- National Hurricane Center
- National Oceanic and Atmospheric Administration
- Pacific Earthquake Engineering Research Center
- Risk Management Center at the Wharton School, Univ. of Pennsylvania
- University of Rhode Island, Graduate School of Oceanography

Nepal earthquake: social impact on children

“We don’t know when we will have a new house.”

“We don’t have safe drinking water.”

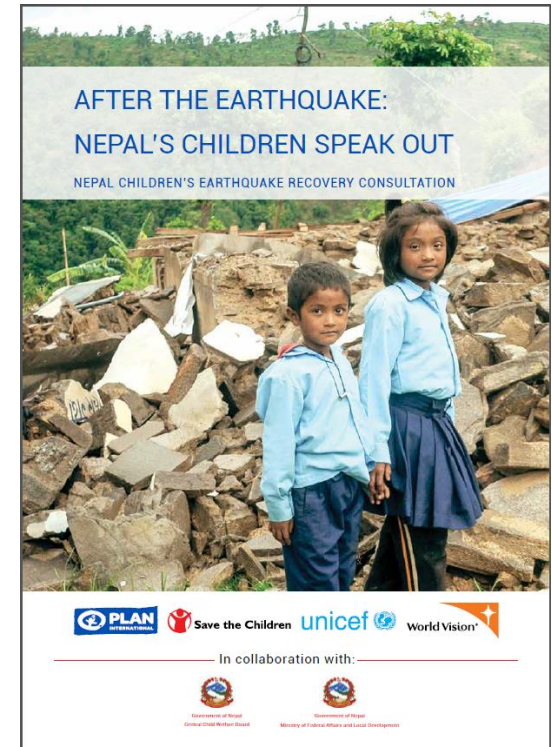
“We are living in a tent and cannot sleep at night.”

“I’d like to go to school just like before.”



Many children continue to live in temporary shelters after the earthquake destroyed their homes.

RAJAN ZAVETI/SAVE THE CHILDREN



RenaissanceRe