Cambridge Judge Business School

Cambridge Centre for Risk Studies 2017 Risk Summit

THE INSURANCE GAP & POST-CATASTROPHE RECOVERY

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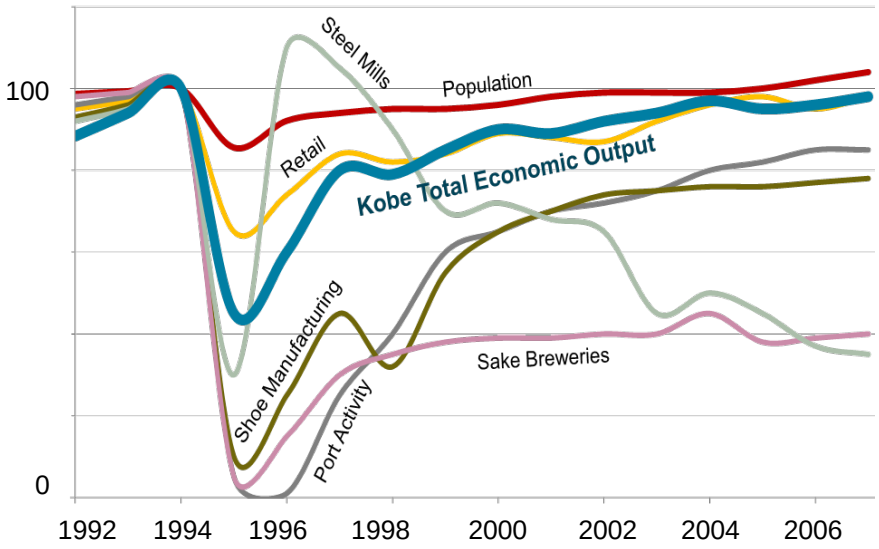
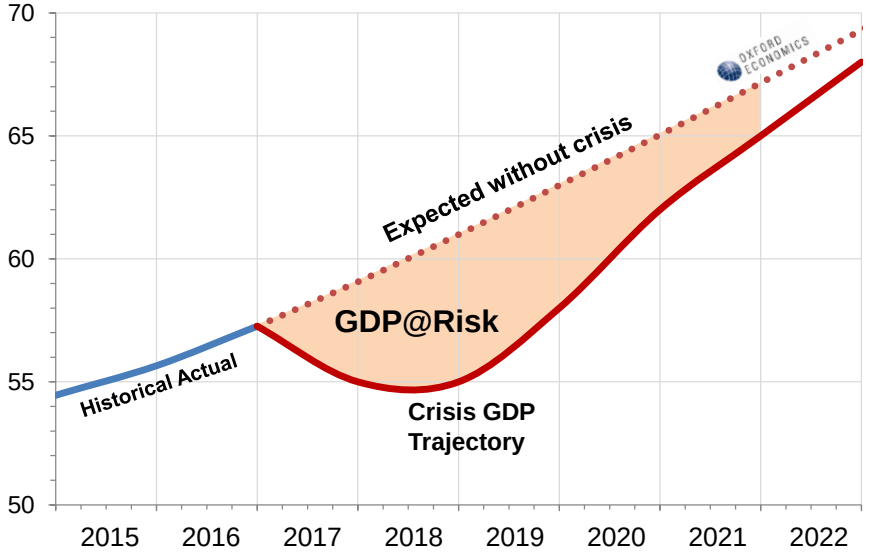
Learning From Post-Catastrophe Recovery

Project Pandora – current multi-threat risk framework

Historical: Kobe Earthquake impacts



Project Pandora: GDP@Risk



Project Pandora – Calibration using case studies

Research proposal:

- Impact from natural disasters
- The role of insurance in recovery

Taking steps toward:

- Impact from multi-threat disasters
- Calibrate Pandora resilience factors

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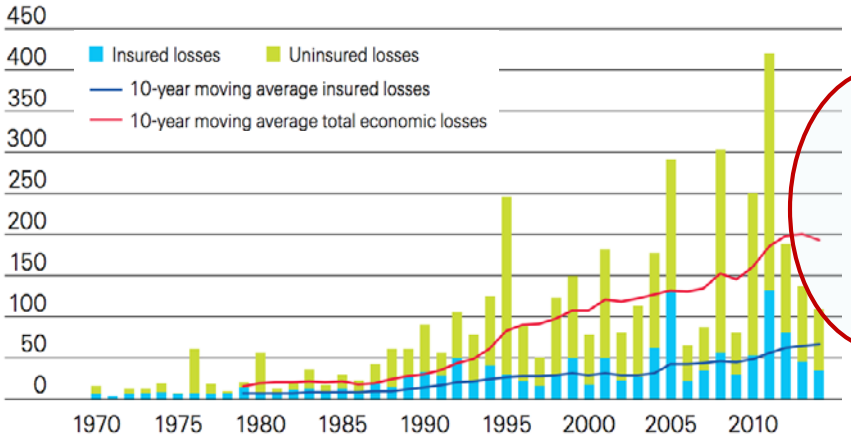
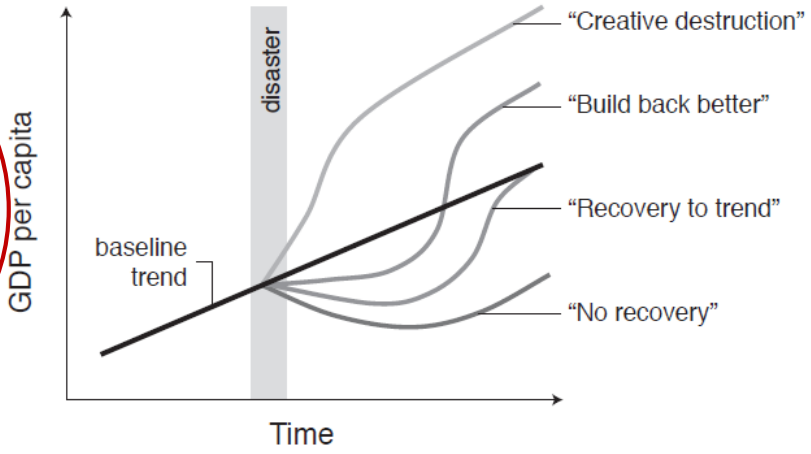
Economic Damage to Economic Loss

- Economic damage
  - Stock loss such as damage to property, infrastructure
  - Mostly instantaneous
  - Well-documented increasing economic damage in recent years
- Economic loss
  - Flow loss such as GDP
  - Measured post-disaster
  - Difficult to measure, difficult to isolate the cause
  - May not necessarily be a loss

Total economic and insured catastrophe damage/loss (2014 prices)



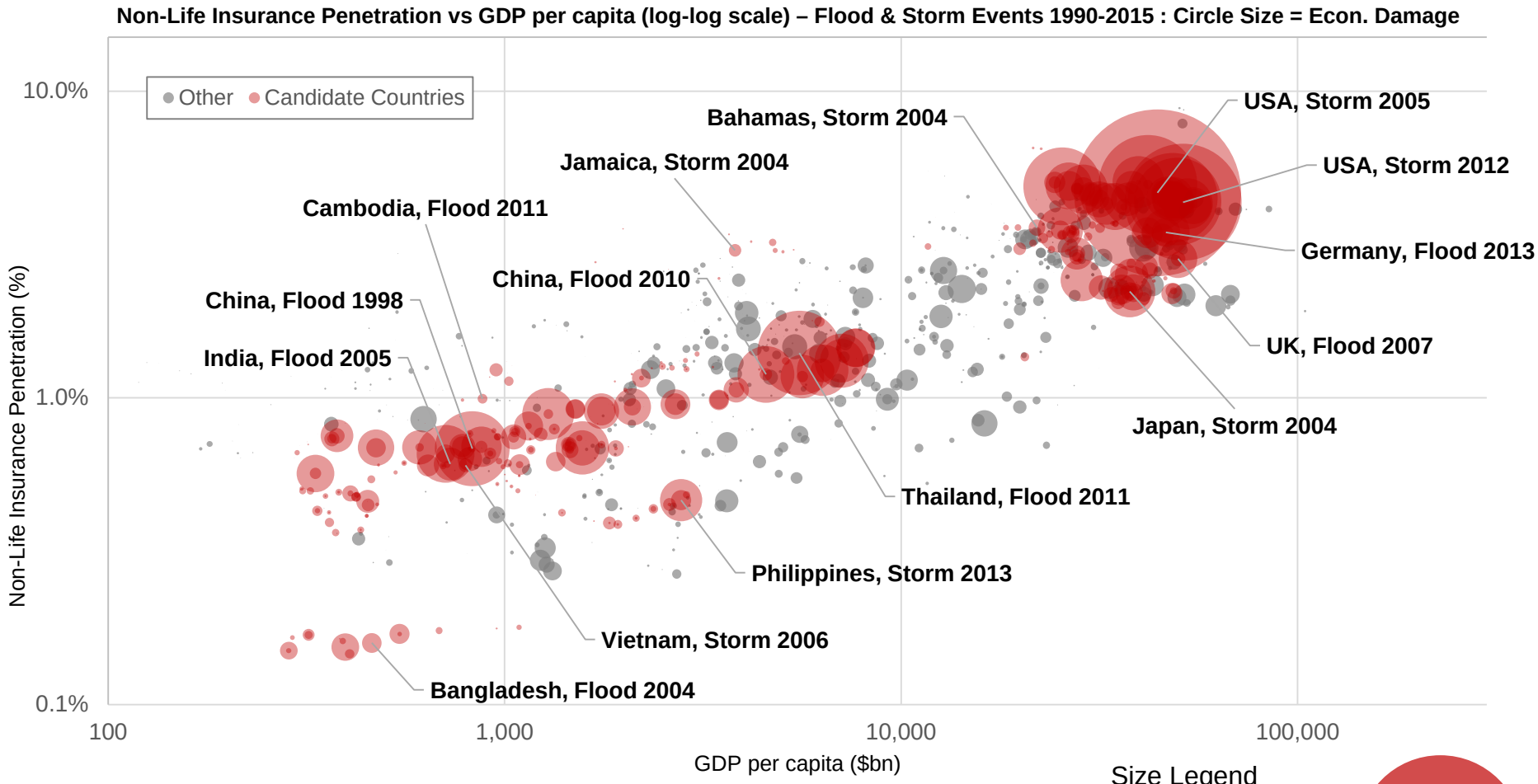
Source: Swiss Re Economic Research and Consulting and Cat Perils



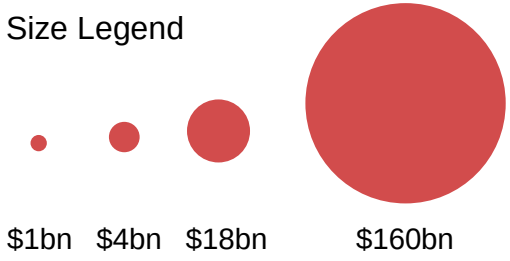
Source: Hsiang and Jina, 2014

What factors affect this function? What is the role of insurance?

Insurance, GDP, and Economic Damage 1990-2015



- Insurance penetration is positively correlated with GDP/capita (non-linear)
- Significant economic damages occur at all income and insurance levels



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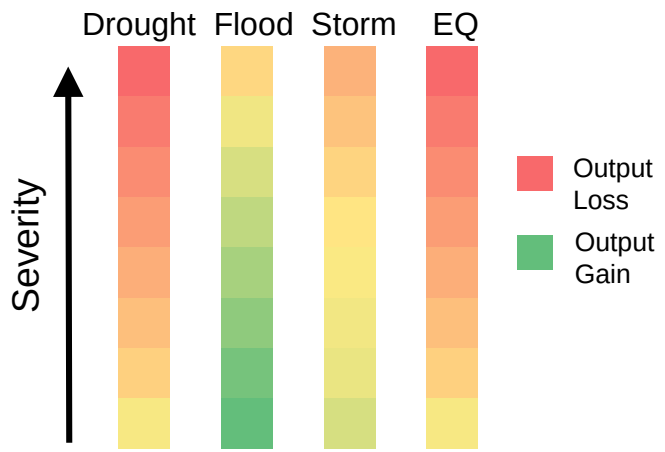
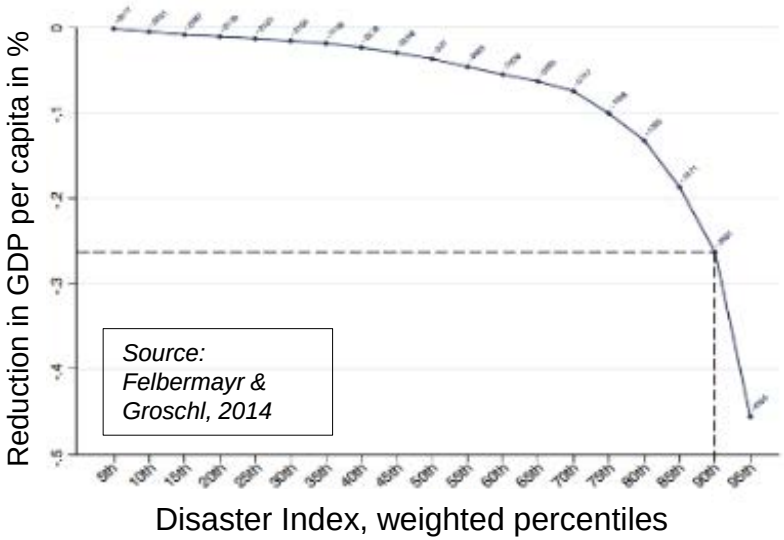
Disaster Type and Severity



Source: Based on findings from Skidmore & Toya, 2002



Impact varies by disaster type, even in direction

- Storms/earthquakes impact capital; floods/droughts impact productivity

What sectors are affected?

- Floods positively impact agricultural output, which can lead to industrial growth

What is the impact to behaviour?

- Floods and storms can often be forecasted –> preparation for known risk
- Mitigation preferences vary by income level

Impact varies by disaster severity, and only the largest seem to matter

- Non-linear relationship between disaster intensity and growth

Moderate severity impacts can be good

- *Moderate* flood GDP impact +1%; *Severe* storm GDP impact -1.1%

Very severe disasters can cause other ‘disasters’

- E.g. political revolutions

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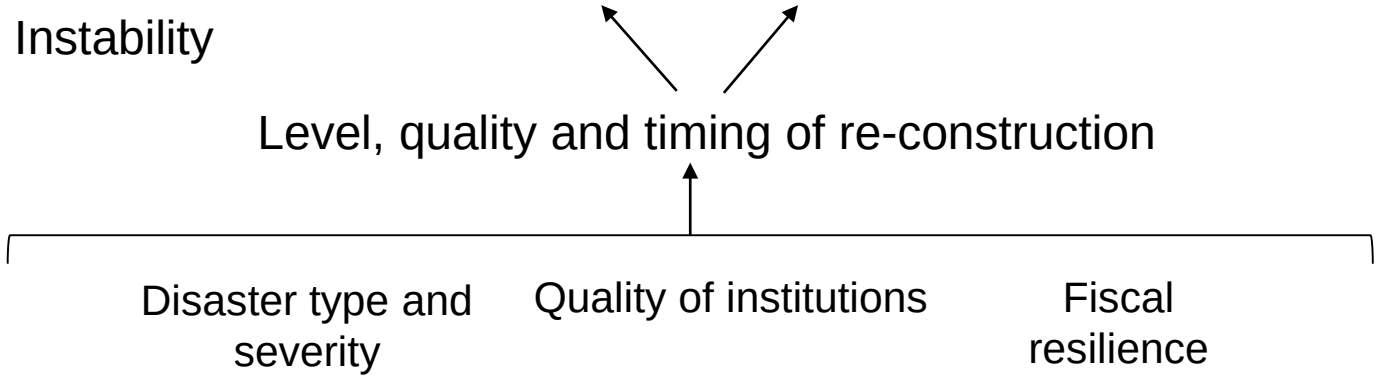
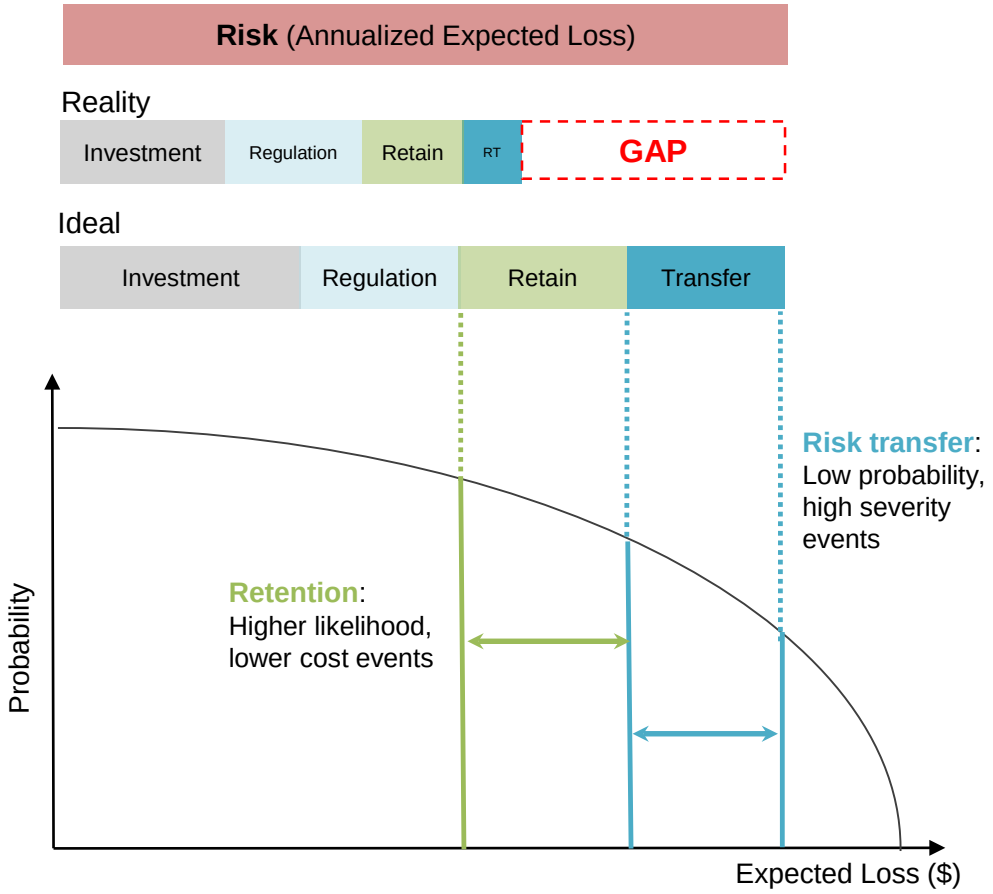
Creative Destruction or Always Negative?

	Negative Impact	Positive Impact
Supply	▪ Destruction of productive capital, infrastructure, environment ▪ Deaths, outward migration	▪ Replacement of least productive capital ▪ Introduction of new technology
Demand	▪ Reduction in consumption and investment ▪ Outflow of population ▪ Fiscal imbalances ▪ Instability	▪ Increase in re-construction activity ▪ In-flow of population



The Role of Insurance: Fiscal Capacity to Rebuild



Source: Derived from UNISDR, 2015

Meeting immediate needs

- Liquidity gap
- Ex-post disaster financing can be unreliable and slow to materialize

Meeting future needs

- Inefficient diversion of funds
- Increased debt
- Increased taxes
- Inflation

Price of stability

- Existence of insurance necessary for a stable investment environment

Insurance is not the only factor

- Quality of institutions
- Strong financial sector & regulation

Proposed Case Studies

Category: Asia – Monsoons & Typhoons

Southeast Asia – High occurrence of typhoons

- Vietnam – 2006 (Typhoon Xangsane and Typhoon Chanchu)
- Philippines – 2013 (Typhoon Haiyan)

Indian Sub-continent – Monsoon Riverine flooding

- Bangladesh – floods 2004
- India – floods 2005

Southeast Asia - Monsoon Riverine Flooding

- Cambodia - 2011
- Thailand - 2011

China – large economy with high frequency of disasters

- China - flood 1998, 2010

Category: High income countries

United States – high income economy with large and frequent disasters

- US - storm 2005 (Hurricane Katrina), 2012 (Hurricane Sandy)

Europe – high income economies with moderate disasters

- Germany - storm 2013
- UK - flood 2007

Japan – large economy with high frequency of disasters

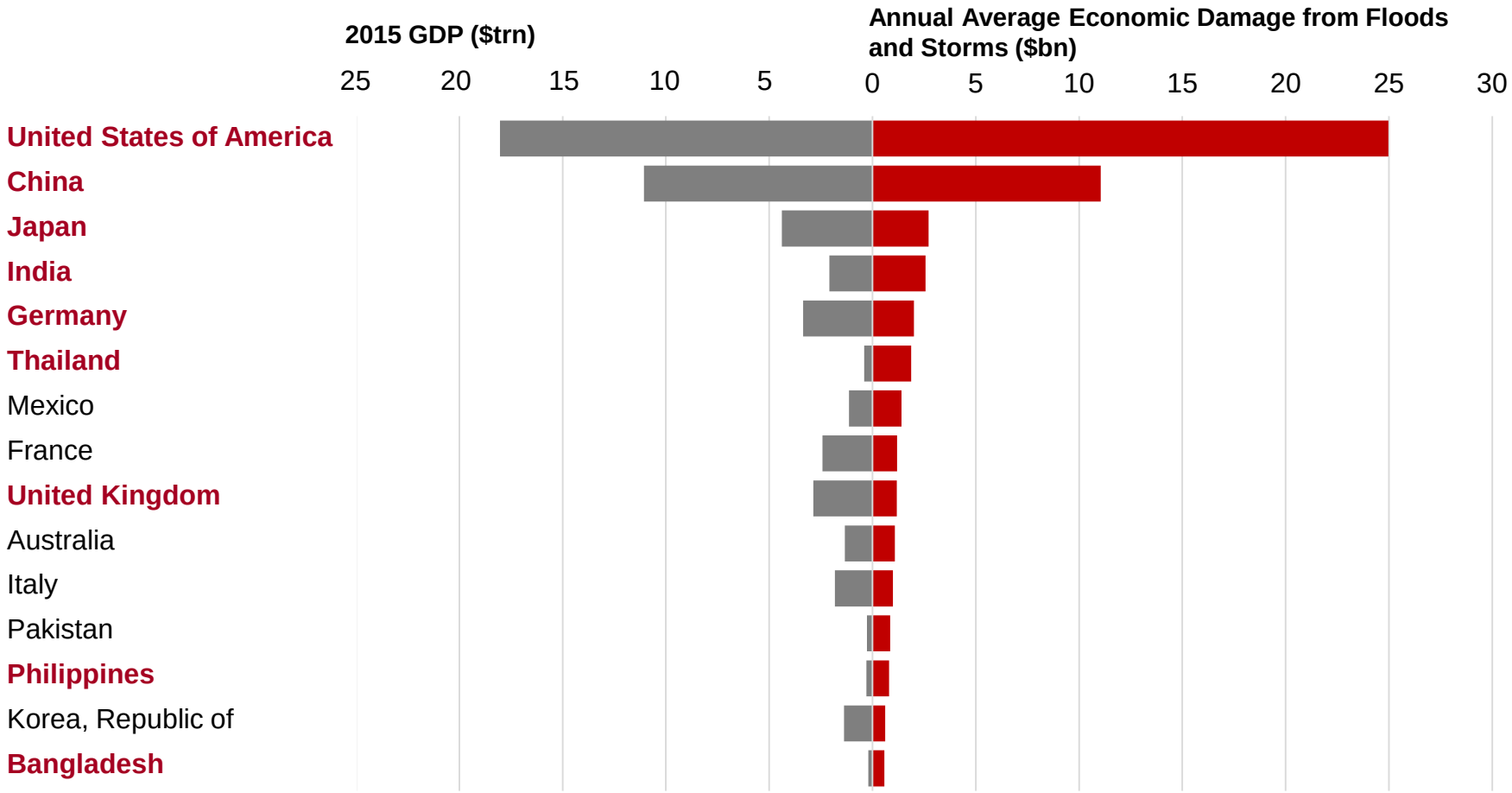
- Japan – storm 2004

Caribbean – middle income economies with large and frequent disasters

- Bahamas, Jamaica - storm 2004 (Hurricane Frances, Jean, Ivan)

Top 15 countries - annual economic damage (total)

- US and China incur largest average annual loss due to flood and storms; other large economies appear here as well with a smaller share of GDP lost
- Smaller economies also incur significant total damage such as Thailand



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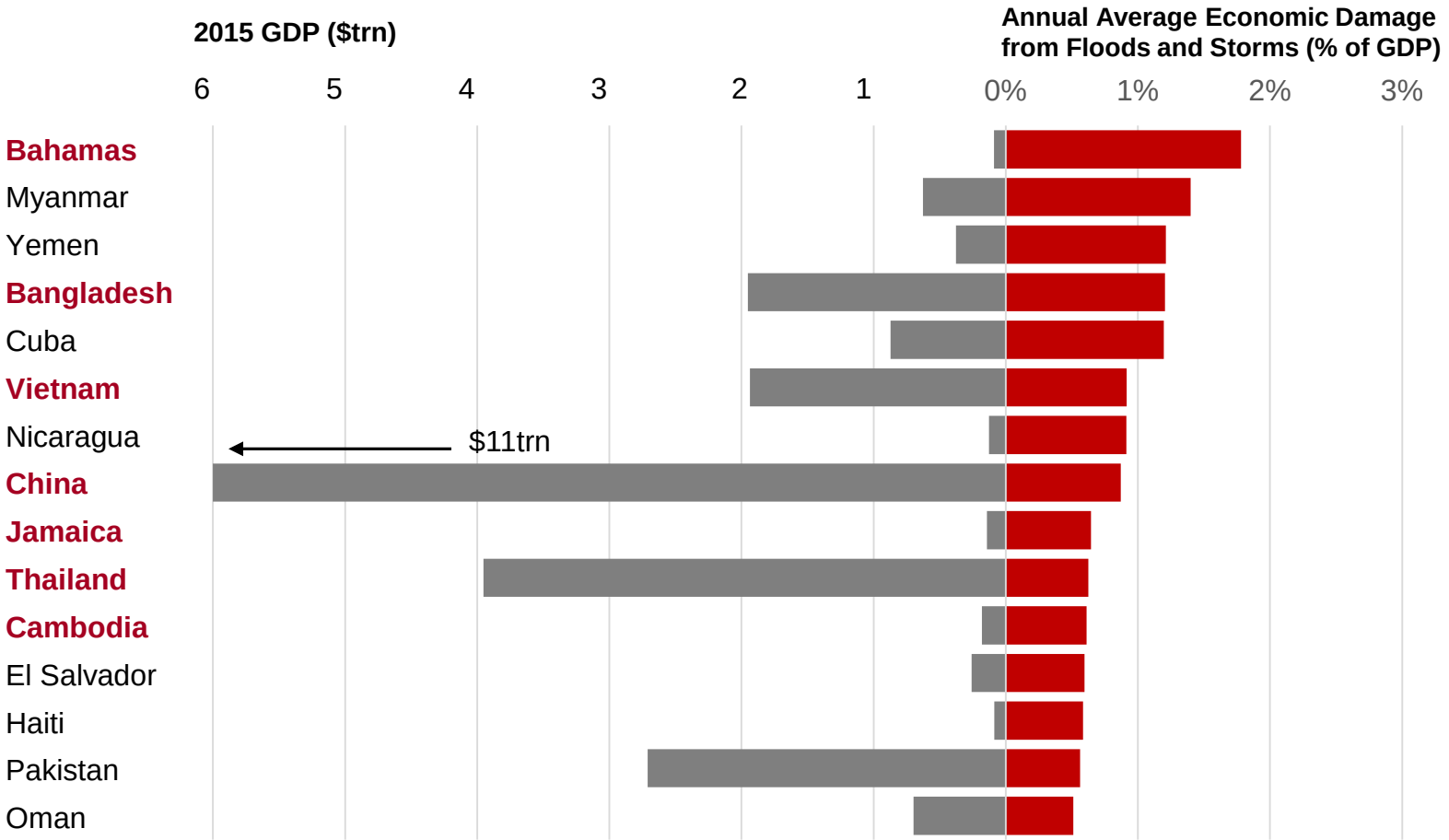
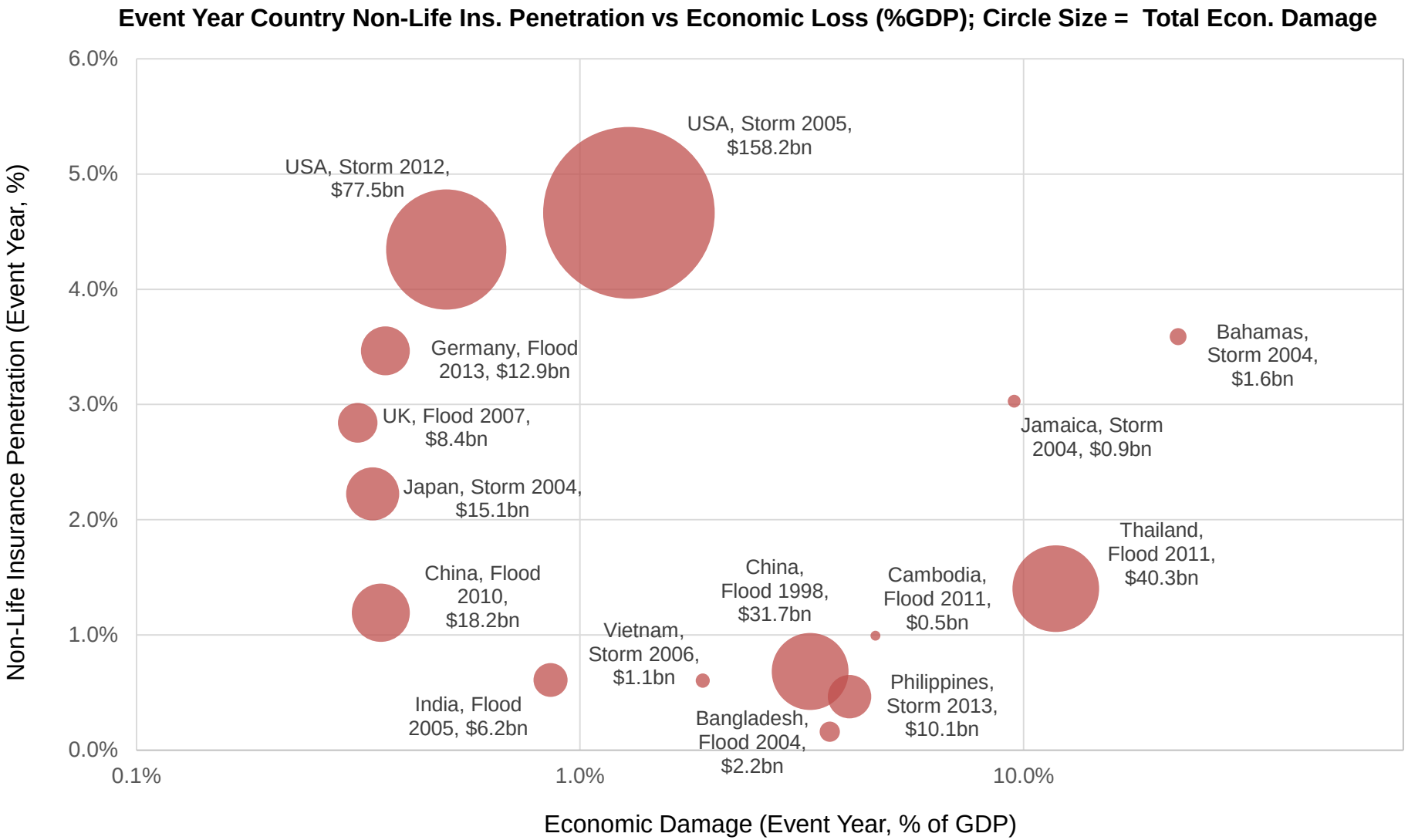
Top 15 countries - annual economic damage (% of GDP)

- Not only small economies suffer large losses as a percentage of their economy due to natural disasters, e.g. China, Thailand



Event Analysis: Insurance Penetration Range



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Summary of Upcoming Year's Research

Overall Objective: Determine the impact of insurance as a factor of resilience

Over upcoming year: Case Study Comparisons

- Comparison of variety of income levels (and insurance penetration):
  - Bangladesh riverine flooding vs Germany riverine flooding
  - US hurricane season vs. South-east Asia typhoon season
- Comparison between events in different years and regions
  - US hurricane: Hurricane Sandy 2012 vs Hurricane Katrina 2004
  - Bangladesh: 1998 floods vs. 2004 floods

- Analyse local level sector data and resultant impacts to macro-economy
- Timing of insurance payments compared to timing of recovery
- Impact of alternative financing mechanisms

Future Goal: Calibrate resilience factor within Pandora multi-threat framework

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